CHAROTAR INSTITUTE OF PARAMEDICAL SCIENCE, CHARUSAT
STUDENT FEEDBACK ANALYSIS REPORT
AY 2017-2018

Date: 15/06/2018

Department: Medical Laboratory Technology
Program: MSMLT

Curriculum feedback quantitative analysis

Point No.	Curriculum Feedback Criteria	Grade (G) (10)
1.	Course structure	8.86
2	Depth of the course content	8.29
3	Learning values (in terms of skills, concepts, knowledge, analytical abilities, or broadening perspectives)	7.71
4	Compatibility with industry standards	6.57
5.	Compatibility with current global scenario of academics	6.86
6.	Compatibility with the real life situation	7.14
7.	The curriculum is sufficient to enable students for analysis of science challenges and identify the necessary solutions	6.86
8.	Sufficient reference material and books are available for the topics mentioned in the syllabus	6.29
9.	Overall Rating	7.43
Average Grade point (10)		**7.33**

Statistical process to analyse data

Grade for a point indicator 'P' is calculated as follows, on the scale of 10.

$G_P = [(5 * N_{P5} + 4 * N_{P4} + 3 * N_{P3} + 2 * N_{P2} + N_{P1})/N] * 2$

N = Number of students who have submitted response to the point indicator 'P'.

N_{P5} = Number of students who have given 5 marks to the point indicator 'P'.
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N_{P1} = Number of students who have given 1 mark to the point indicator 'P'.

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Head of MLT Dept.
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STUDENT FEEDBACK ANALYSIS REPORT
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Student suggestions to improve the syllabus:

- No suggestions

Improvement Action Plan:

- Scheduling clinical hours for more clinical exposure & hands on clinical practice.
- Availability of learning resources
- Organizing hands on training / workshop on advance techniques.
- Guidance for competitive exams and carrier counselling.

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CHAROTAR INSTITUTE OF PARAMEDICAL SCIENCE, CHARUSAT
STUDENT FEEDBACK ANALYSIS REPORT
AY 2017-2018

Date: 15/06/2018

Department: Operation theatre and Anaesthesia technology
Program: BOTAT

Curriculum feedback quantitative analysis

Point No.	Curriculum Feedback Criteria	Grade (G) (10)
1.	Course structure	8.57
2	Depth of the course content	8.57
3	Learning values (in terms of skills, concepts, knowledge, analytical abilities, or broadening perspectives)	8.43
4	Compatibility with industry standards	7.43
5.	Compatibility with current global scenario of academics	8.29
6.	Compatibility with the real life situation	8.43
7.	The curriculum is sufficient to enable students for analysis of science challenges and identify the necessary solutions	8.14
8.	Sufficient reference material and books are available for the topics mentioned in the syllabus	7.43
9.	Overall Rating	7.86
Average Grade point (10)		**8.13**

Statistical process to analyse data

Grade for a point indicator 'P' is calculated as follows, on the scale of 10.

$G_P = [(5 * N_{P5} + 4 * N_{P4} + 3 * N_{P3} + 2 * N_{P2} + N_{P1})/N] * 2$

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N_{P1} = Number of students who have given 1 mark to the point indicator 'P'.

Student suggestions to improve the syllabus:

- Improvement in library resources

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Improvement Action Plan:

- Skill laboratories: Students can practice clinical training procedures in a safe environment prior to real life application.
- MOU with hospitals, so that students can get more exposure to clinical training in real life situations in the Operating Room.

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CHAROTAR INSTITUTE OF PARAMEDICAL SCIENCE, CHARUSAT
STUDENT FEEDBACK ANALYSIS REPORT
AY 2017-2018

Date: 12/06/2018

Department: Optometry
Program: BOP

Curriculum feedback quantitative analysis

Point No.	Curriculum Feedback Criteria	Grade (G) (10)
1.	Course structure	8.67
2	Depth of the course content	8.00
3	Learning values (in terms of skills, concepts, knowledge, analytical abilities, or broadening perspectives)	9.00
4	Compatibility with industry standards	8.67
5.	Compatibility with current global scenario of academics	8.33
6.	Compatibility with the real life situation	8.00
7.	The curriculum is sufficient to enable students for analysis of science challenges and identify the necessary solutions	8.67
8.	Sufficient reference material and books are available for the topics mentioned in the syllabus	7.67
9.	Overall Rating	8.67
Average Grade point (10)		**8.41**

Statistical process to analyse data

Grade for a point indicator 'P' is calculated as follows, on the scale of 10.

$G_P = [(5 * N_{P5} + 4 * N_{P4} + 3 * N_{P3} + 2 * N_{P2} + N_{P1})/N] * 2$

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N_{P1} = Number of students who have given 1 mark to the point indicator 'P'.

Student suggestions to improve the syllabus:

- Everything is good & No more suggestions

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Head of Optometry Dept.
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Improvement action plans:

→ Library resources are strengthen by increasing budget for library resources. E-Resource has been developed so that it will be easy access for student from anywhere. and it will be continue in next academic year also

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CHAROTAR INSTITUTE OF PARAMEDICAL SCIENCE, CHARUSAT
STUDENT FEEDBACK ANALYSIS REPORT
AY 2017-2018

Date: 15/06/2018

Department: Medical Imaging Technology
Program: BMIT

Curriculum feedback quantitative analysis

Point No.	Curriculum Feedback Criteria	Grade (G) (10)
1.	Course structure	7.68
2	Depth of the course content	7.47
3	Learning values (in terms of skills, concepts, knowledge, analytical abilities, or broadening perspectives)	7.05
4	Compatibility with industry standards	7.26
5.	Compatibility with current global scenario of academics	7.37
6.	Compatibility with the real life situation	7.26
7.	The curriculum is sufficient to enable students for analysis of science challenges and identify the necessary solutions	7.26
8.	Sufficient reference material and books are available for the topics mentioned in the syllabus	6.84
9.	Overall Rating	7.37
Average Grade point (10)		7.29

Statistical process to analyse data

Grade for a point indicator 'P' is calculated as follows, on the scale of 10.

$G_P = [(5 * N_{P5} + 4 * N_{P4} + 3 * N_{P3} + 2 * N_{P2} + N_{P1})/N] * 2$

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STUDENT FEEDBACK ANALYSIS REPORT
AY 2017-2018

Student suggestions to improve the syllabus:

- MRIT syllabus should be divided into two semesters it was every tough to study in one semester
- No more suggestions

Improvement Action Plan:

- Improvement in the library resources & its availability.
- Syllabus revision as per the suggestions of BOS members & the academic faculties.
- Improvement of clinical exposure.

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CHAROTAR INSTITUTE OF PARAMEDICAL SCIENCES
AY 2017-2018

CIPS

Curriculum feedback analysis and action taken report

Sr. No.	Stakeholder	Feedback	Action Taken
1.	Clinicians/ Practitioner	Students must get continuous clinical exposure	Increase in number of outside clinical linkages will encourage all students to take advantage during clinical posting.
2.	Academic peers	Focus more on basic fundamental learning of the domain subject	Fundamental concepts and the importance of the domain subject will be introduced to the students during commencement period by the subject expert.
		Teaching curriculum review	Curriculum reviewed academic year wise
3.	CHARUSAT teachers	Clinical exposure must be enhanced as per number of students	Increase in number of outside clinical linkages will encourage all students to take advantage during clinical posting.
		Summer internship must be encouraged among students	Students regularly encouraged participating in fellowships/ internship.
		Students must be aware of advance technologies in medicine.	Students were taken to Akansha hospital for educational tour to reveal them of advancement in technologies.
			Optometry students were taken to Blind people association, Ahmedabad to provide subject domain knowledge and advancement.
			Hands on training were organized to facilitate the learning of

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			advance techniques.
4.	Parents	Improvement in library resources	Library resources will be strengthen and improved in its accessibility
5.	Present students	Improvement in library resources Syllabus is lengthy	Library resources will be strengthen and improved for its accessibility. Syllabus revision as per suggestion of BOS members and academic faculty.

Dr. Darshan H. Patel
Principal
CIPS, CHARUSAT

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CHARUSAT CAMPUS CHANGA

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CHAROTAR INSTITUTE OF PARAMEDICAL SCIENCES

Annual Report

Academic Year: 2018-2019

CHARUSAT
CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY
Accredited with "A" grade by NAAC, Govt. of India

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CIPS JOURNEY SO FAR…

Charotar Institute of Paramedical Sciences (CIPS), a constitute of CHARUSAT, was established in the year 2015 with an aim to create next generation skilled health care professionals through quality education, extensive Clinical training to provide utmost excellence in health care delivery and Community services.

CIPS started with 3 undergraduate (UG) programs naming Bachelor of Science in Medical Imaging Technology (BMIT), Bachelor of Science in Operation Theater and Anesthesia Technology (BOTAT), Bachelor of Optometry in the academic year 2016-2017 and one PG (postgraduate) program MSMLT (Master of Science in Medical Laboratory Technology) in the academic year 2017-2018.

In this Academic year 2018-2019, CIPS introduced one more new UG (undergraduate program) naming BSMT (MLT) (Bachelor of Science in Medical Technology (Medical Laboratory Technology)) with four year duration.

The UG programs were of four year duration (3 year of Academics and 1 year of clinical internship) and the PG program is of 2 year duration (1 year academics and I year research)

Vision:

"To be a leading institute in the field of Allied Health Sciences with amalgamation of best Education, Research and Patient care."

Mission:

"To prepare skilled allied health care professional by high standard of education delivery, extensive clinical exposure and research.

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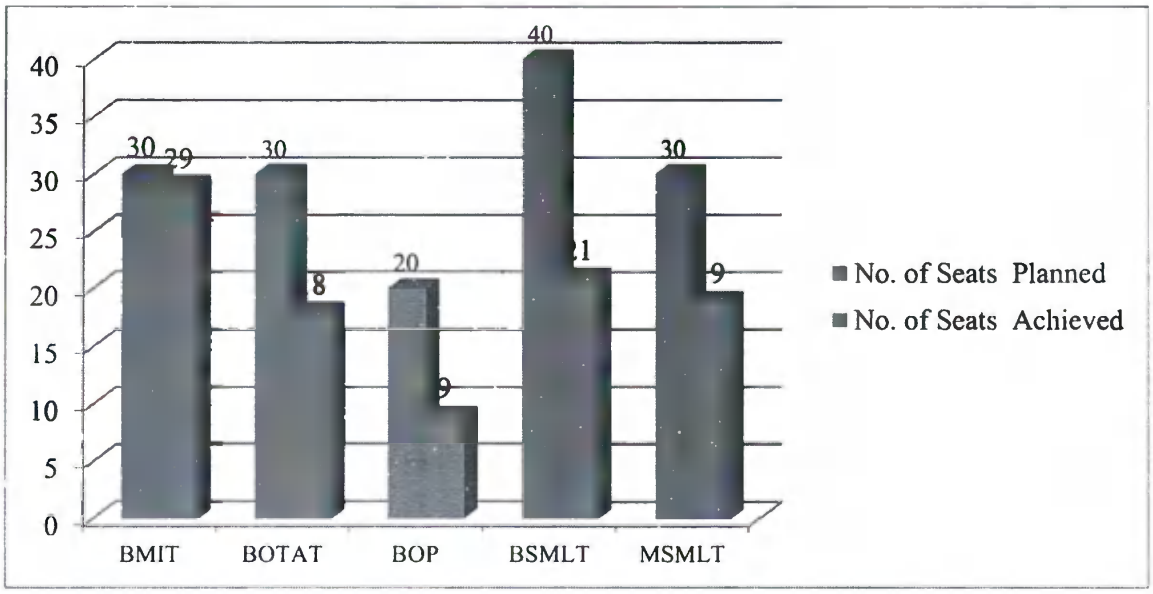
Admission Criteria

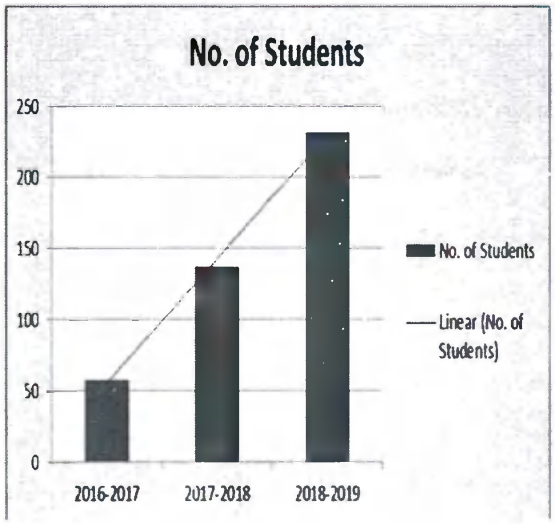
Eligibility criteria for all programs (BMIT, BOTAT, BOP) is ≥50% in PCB of 12th class and more than 60% students enrolled with more than 50% PCB marks

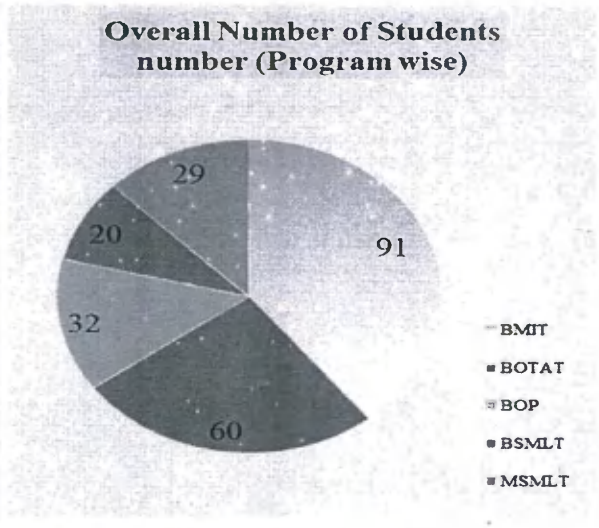
Eligibility criteria for PG program is ≥5 CGPA in UG and all students enrolled with 5 CGPA and above.

Student Enrollment

Ninety six students enrolled in the academic year 2018-2019.







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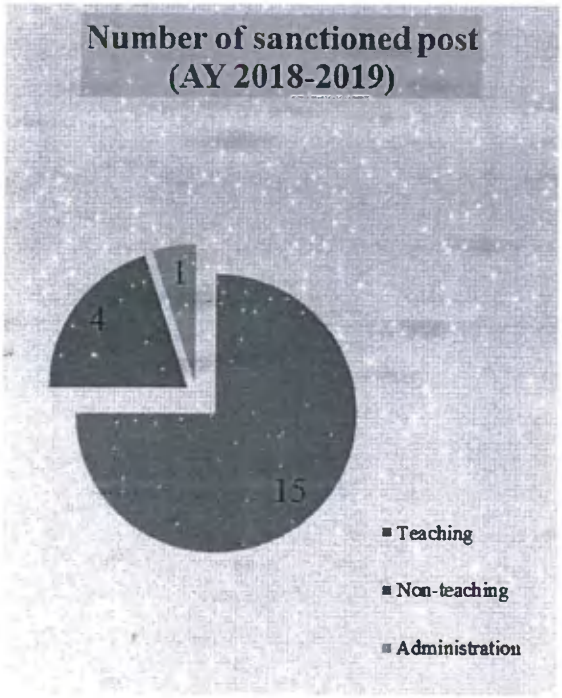
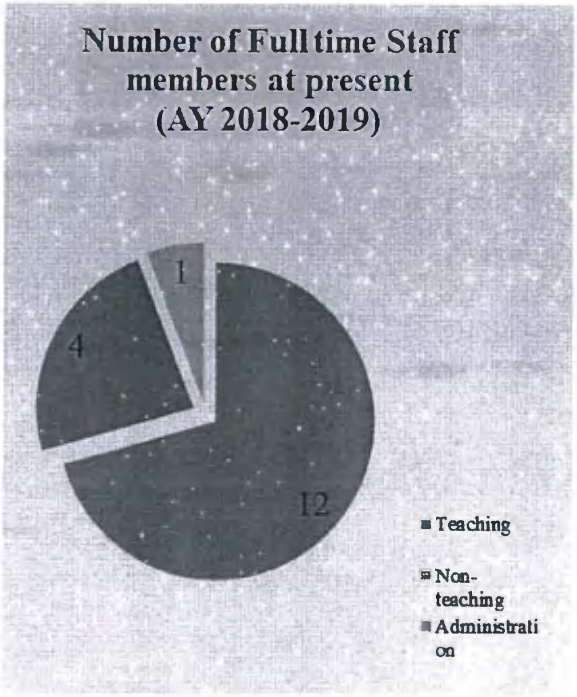
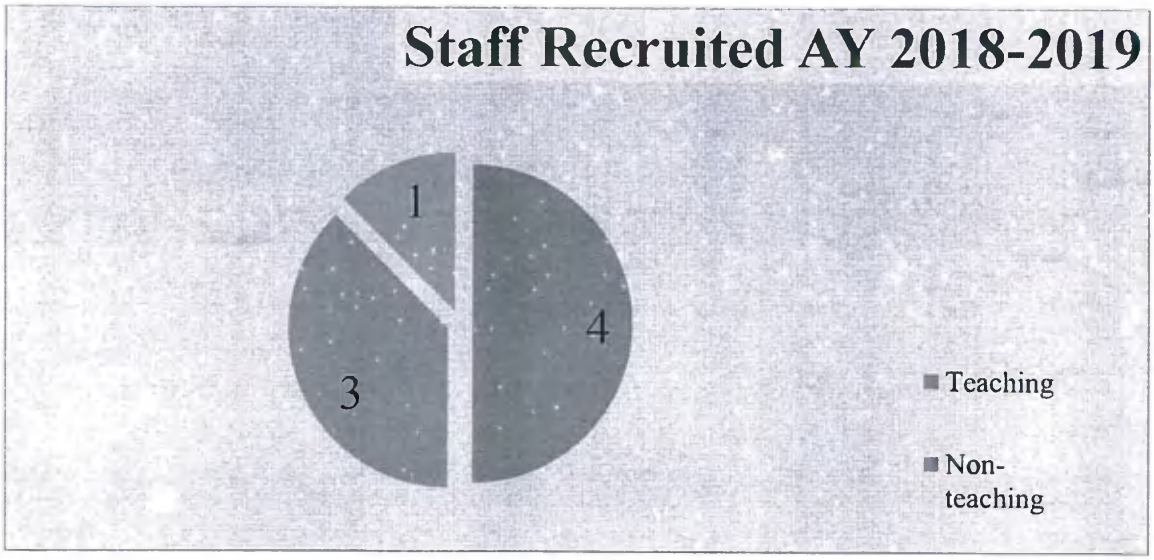
Faculty Strength

- Four specialized teaching faculty and three professional clinical instructors recruited with the domain knowledge and technical skills to impart and fulfill the students' key essential with our mission.
- One administrative staff recruited for the smooth flow of admin work.







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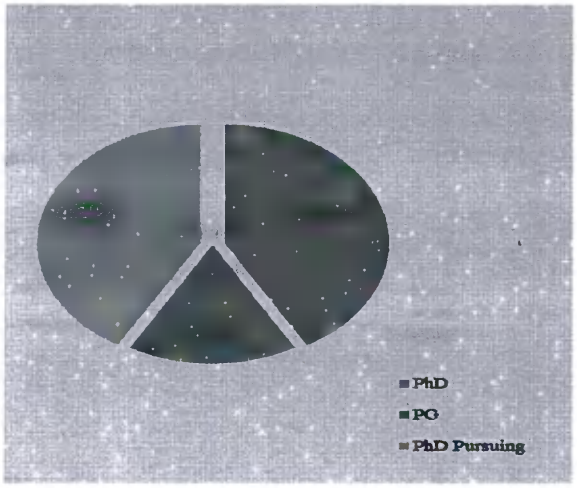
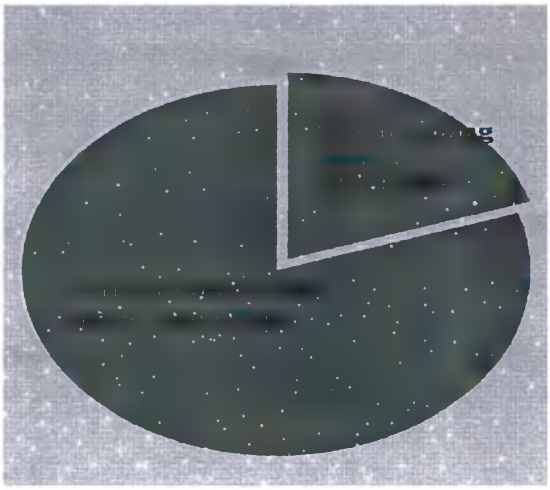
Bifurcation of teaching faculty

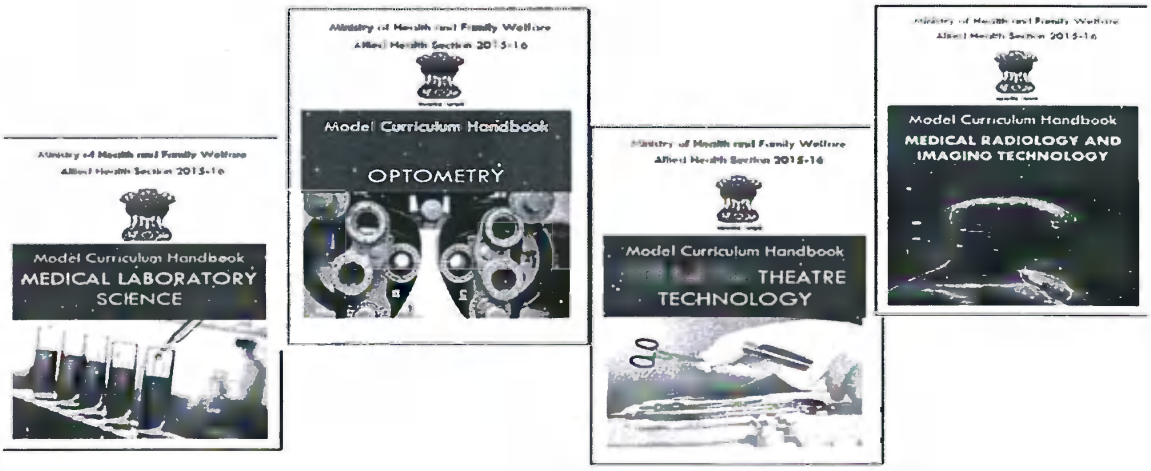




Curriculum Development

Teaching curriculum

- The core syllabus and teaching schemes were initially adopted from the national guidelines Ministry of Healthcare and Family Welfare (MoHFW), Allied Health Section 2015-2016.



- The choice based credit system learning adopted from the university.

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- Therefore, the entire syllabus in all the programs of the institute is divided into three major components like:

  1. Core subjects
  2. Allied courses
  3. Elective, Soft skills & humanities

- Feedback from different stakeholders taken, analyzed and appropriate action taken for curriculum development.

Teaching Learning Evaluation

Teaching learning practices:

- **Outside Clinical postings**
  - Teaching curriculum framed with more number of clinical hours to train students for clinical services and patient care.
  - Practically involvement in the clinical and laboratory practices under the guidance of Doctors of respective discipline
  - Developing linkages and MOUs with advanced laboratories and hospitals for the clinical posting and internship of our students

- **Case studies and Presentations**
- Series of Guest lecture and interactive session with expertee focusing to the higher studies, research work and employability of students
- Regular classes for competitive examinations

No. of linkages developed for clinical posting:

- X-ray House, Anand, Gujarat
- Maha Gujarat Hospital, Nadiad, Gujarat
- Subham Clinical Laboratory, Surat, Gujarat

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- Gujarat Adani Institute of Medical Sciences (GAIMS) and G.K. general Hospital, Bhuj, Gujarat
- Krishna Medical Hospital and ICU, Surat, Gujarat
- Nova IVI Fertility, Ahmedabad, Gujarat
- Indian Red Cross Society, Godhra
- Sparsh ortho hospital, Nadiad
- Akshar gynec hospital, Nadiad
- Radhaswami multispeciality hospital, Nadiad
- Samip hospital, Nadiad
- Sanjay multispeciality hospital, Nadiad
- Shlok hospital, Nadiad
- Muljibhai Patel urology hospital, Nadiad
- Smit Orthopaedic Hospital & Dental Clinic, Anand
- Anand laparoscopy hospital, Anand
- Parimal hospital, Anand
- Himalaya hospital, Anand

Events organized under teaching learning practices:

1. Medical Imaging Technology department, CIPS organized **two day workshop on Basic life support (BLS)** for our students and staff to get exposed and learn the training as a part of paramedical profession teaching curriculum and faculty development program. On day one, the student learnt the basics of life support, Anatomy and physiology of Heart and 1 rescuer Adult B.L.S training and on second day students were trained in 2 rescurer Adult B.L.S training, AED and bag mask devices with skill test. Students were benefited & learnt Basic Life Support Techniques.

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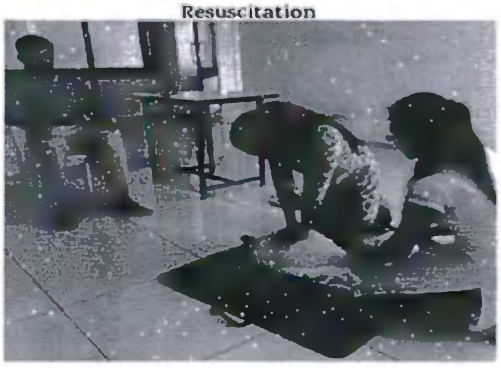
BLS Workshop

Date – 29 and 30th of April 2019

Staff Practising Cardiopulmonary Resuscitation

Staff training students for One Rescuer Adult CPR



Student practising hands on CPR

Students learning stabilisation of patient

2. Operation theater and Anesthesia Technology department, CIPS celebrated the **Anesthesia Technician Day 2019** by inviting an professional Anesthetist "Dr. Hemlata Kamat" Professor at PSMC, Karamsad. She gave an eminent talk on "Recent advances in Anesthesia". She briefly explained the recent anesthetic drugs in use in clinical care practice. Our BOTAT students actively participated in Quiz competition, Poster Presentation, Skit for CPR and making Video addressing role of healthcare personnel in emergency situation. Our chief guest showed active participation in student's activity by guiding them the advanced leaning.

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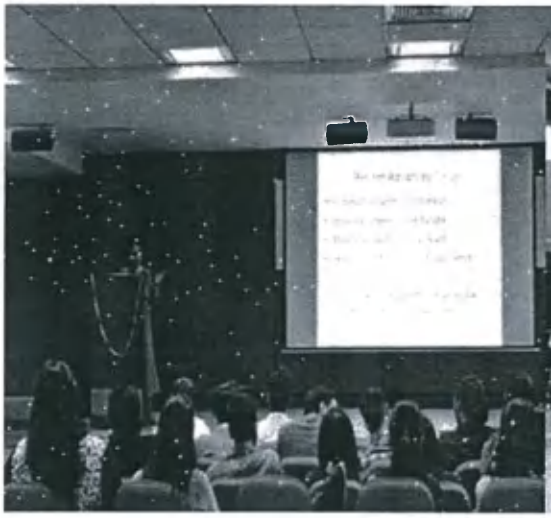

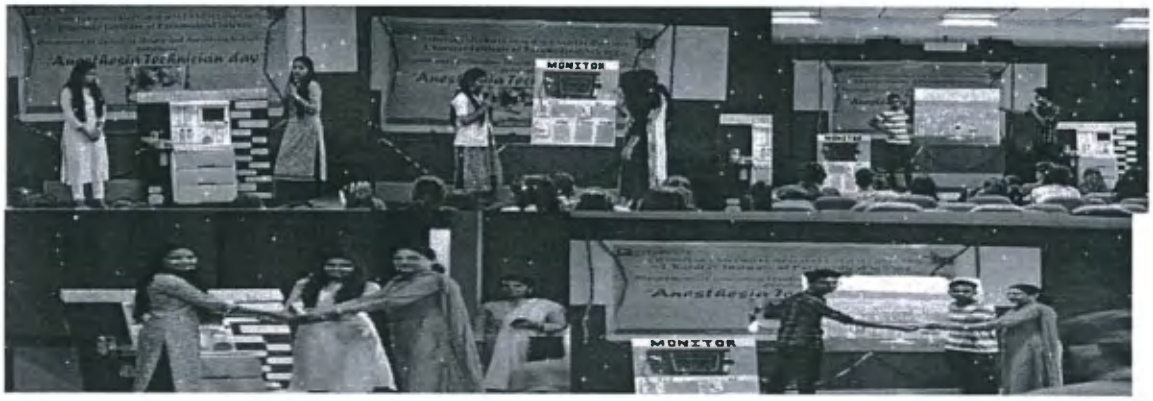

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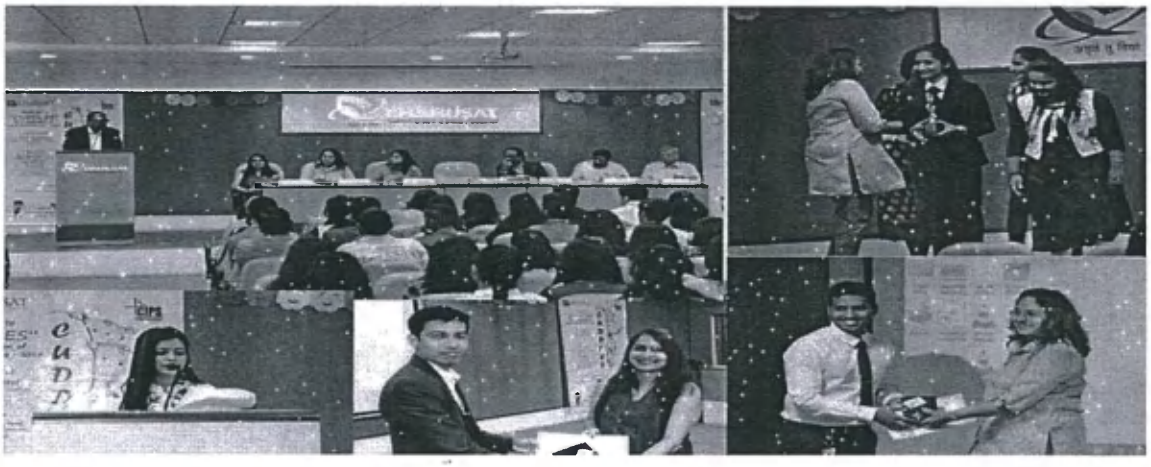
3. Department of Optometry, CIPS celebrated the **World Optometry Day 2019** by organizing an event "Cuddles" at State level. . The event included invited talks from renowned experts from the field and poster competition on pediatric eye care theme.



4. Department of Medical Laboratory Technology, CIPS has organized **a series of guest lecture from pharmacy background.** The lectures were planned with motifs of 1.) Exposing the students to the recent advancements in the pharma industries, 2.) Role of medical technology students in the pharma industries 3.) Introducing our students to the pharma individuals for commencing their dissertation training or summer training and 4.) As a part of their curriculum. Dr. Velmurugan Ramasamy, Senior Scientist at Century Pharmaceuticals ltd.Vadodara and Mr. Arun Singh, DGM at Zydus Research Center and Cadila Healthcare Ltd. Ahmedabad were invited. The students got the idea for different perspective for their career.
5. A one day seminar on **"Mind Programming and Personality development in better placement"** was organized on 25th Sept 2018 for our students to motivate them towards building their career and to make them aware about mind programming in achieving their goals of life. Guest speaker Ms. Dulari Bhatt, Assistant professor, Gandhinagar Institute of Technology, Kalol was invited to conduct the seminar
6. Medical Laboratory Technology Department, CIPS arranged a **three day hands on training and proteomic workshop thorough with 2 Dimensional Gel Electrophoresis, Proteomic Bioinformatics and PD Quest software** on 8th August to 10th August 2018 in support with BioRad Laboratories. The workshop was beneficial for MLT students under and faculty under teaching learning curriculum and faculty development program.

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7. Medical Laboratory Technology Department, CIPS has arranged one week lecture series under common entrance preparation (CEPC) cell from 9th Feb 2019 to 15th Feb 2019.

Extension Activities:

1. **Breast cancer awareness campaign** was organised by Women Development cell (WDC), CIPS with a theme "Early detection better decision" among female students and staff members of nearby schools in changa, nadiad, anand, damol, mehelav, napad . BMIT 5th semester students actively participated in spreading awareness about Breast cancer and its types, improvement in life style, food habits, imaging modalities available for early screening of breasts by poster presentation and demonstration of early detection of breast cancer. Few school mangament appreciated our work and published our session in the newspaper.

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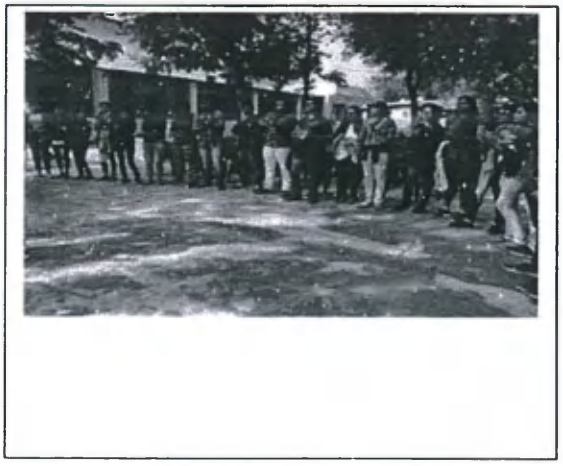
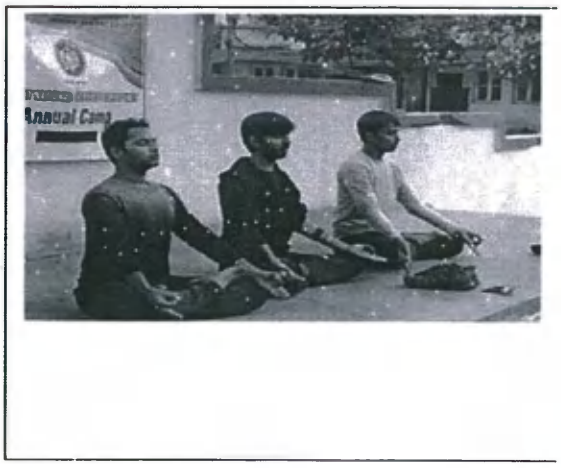
2. CHARUSAT NSS Unit organized the **Independence Day 2018** celebration at CAMPUS, where CIPS students participated the activity under CREDP (Charusat Rural Education Development Program) cell.

3. Twenty BOTAT Students of 4th semester, as a part of BOTAT curriculum and for community healthcare training, participated in Health checkup camps organized by CHRF targeting rural area for the welfare of the community and to bring awareness among them. The event was organized from 19th march 2019 to 29th march 2019. Students helped staff nurses to check the patient's vitals, documentation and to give psychological support to them.

4. CHARUSAT NSS Unit organized an 7 day annual camp at Dabhou village from 16th to 22th January 2019. Five students from CIPS actively participated in the NSS Annual Camp. Student volunteers g opportunity to get real life experience of staying in rural area.





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Evaluation

- Internal and External Examination

  The traditional method of assessment followed for semester wise assessment system for the theoretical subjects.

- Log book record, clinical examination, practical examination, case based discussion for assessing competent skills by subject expert.

UNIVERSITY EXAM RESULT

FIRST TERM 2017-2018

Program name	Semester	No. of students appeared	No. of students passed without backlog	No. of students with first class	No. of students with distinction
BMIT	5	32	27	7	15
BMIT	3	33	32	19	5
BMIT	1	27	22	7	15
BOTAT	5	10	10	4	3
BOTAT	3	32	22	3	3
BOTAT	1	21	20	2	10
BSMT	1	20	13	7	5
BOP	4	15	15	8	2
BOP	2	5	5	3	2
MSMLT	3	10	10	5	4
MSMLT	1	19	18	7	2

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SECOND TERM 2017-2018

Program name	Semester	No. of students appeared	No. of students passed without backlog	No. of students with first class	No. of students with distinction
BMIT	6	32	28	6	16
BMIT	4	33	21	15	5
BMIT	2	24	17	8	9
BOTAT	6	10	10	3	5
BOTAT	4	31	18	6	3
BOTAT	2	18	14	4	5
BSMT	2	20	16	7	5
BOP	5	15	14	7	2
BOP	3	5	5	3	2
BOP	1	9	8	8	2
MSMLT	4	10	10	5	4
MSMLT	2	19	19	9	3

Student Participation and Achievements

1. CIPS celebrated the Diwali 2018 with faculty and students by organizing an event Pre Diwali Celebration". To bring out the essence of festival- celebration of life and goodness we have organized some competitions for students like Rangoli competition, Cartooning, Collage

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making, Photography. The students showcased the spirit by participating in the events and enjoyed the Pre Diwali celebration.

Student Achievements

Rank	Event title	Level	Type of activity	Name of the student	Date of award/ medal	Awarding agency
1st Prize	Science Excellence 2018	State	Poster presentation	Kumbhani Rushitaben Jentibhai	20th Sept 2018	Gujarat University
				Savaliya Hiral Ashokbhai		
2nd Prize	Science Excellence 2018	State	Poster presentation	Dholu Dipti Naran		
				Patel Praptiben Hirenkumar		

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1st Prize	33rd Gujarat Science Congress	State	Poster presentation	Bera Jignasa Hareshbhai	3rd Feb 2019	L.J. Institute of Applied Sciences
1st Prize	Science Manthan 2019	State	Poster presentation	Patel Dimpy Priteshkumar	5th Jan 2019	PDPIAS, CHARUSAT
2nd Prize				Gandhi Pooja Ketankumar		
1st Prize	Science Manthan 2019	State	Poster presentation	Patel Nandniben Nitinkumar	5th Jan 2019	PDPIAS, CHARUSAT
				Patel Riddhi Dineshbhai		
2nd Prize	Spoural 2019	University	Cultural	CIPS team	31st Jan 2019	CHARUSAT
Runners up	4th ICA India International T20 Championship -2019	National	Sports	Patel Vraj Sanjaybhai	26th Jan 2019	-
3rd prize	World sight day 2018	State	Poster presentation	Team from BOP 4th SEM		Bhartimaiya college of optometry
1st Prize	Spoural 2019	University	Cultural	Bhavya Hingu	31st Jan 2019	CHARUSAT
2nd Prize	Spoural 2019	University	Cultural	Team of BOTAT students	31st Jan 2019	CHARUSAT
3rd prize	Cuddles-2019	State	Other Scientific	Team from BOP 3rd SEM	23rd Mar 2019	CHARUSAT
1st prize	First regional conference	State	Poster presentation	Team from BMIT 6th SEM	07th April 2019	ISRT

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3rd prize	First regional conference	State	Poster presentation	Team from BMIT 6th SEM	07th April 2019	ISRT
1st Prize	Yoga Khel Mahakumbh	Disrtict	Sports	Patel Rudra	Aug-18	
1st prize	Anesthesia Technician Day 2019	Department	Poster presentation	Patel Rutvi, Patel Hepina, Patel Isha	1st April 2019	CIPS
2nd Prize	Anesthesia Technician Day 2019	Department	Poster presentation	Patel Jay R, Patel Rudra, Patel Ritik	1st April 2019	CIPS
1st Prize	Anti-ragging	Institute	Technical	Pooja Patel	28th Jul 2018	CIPS
1st prize	Pre Diwali celebration	Institute	Rangoli	Kalindi Dalal	2nd Nov 2018	CIPS
2nd Prize	Pre Diwali celebration	Institute	Rangoli	Nandniben Patel	2nd Nov 2018	CIPS
1st Prize	Pre Diwali celebration	Institute	Cartooning	Riddhi Patel	2nd Nov 2018	CIPS
2nd Prize	Pre Diwali celebration	Institute	Cartooning	Helly Bhanderi	2nd Nov 2018	CIPS
1st Prize	Pre Diwali celebration	Institute	Photography	Meet Trivedi	2nd Nov 2018	CIPS

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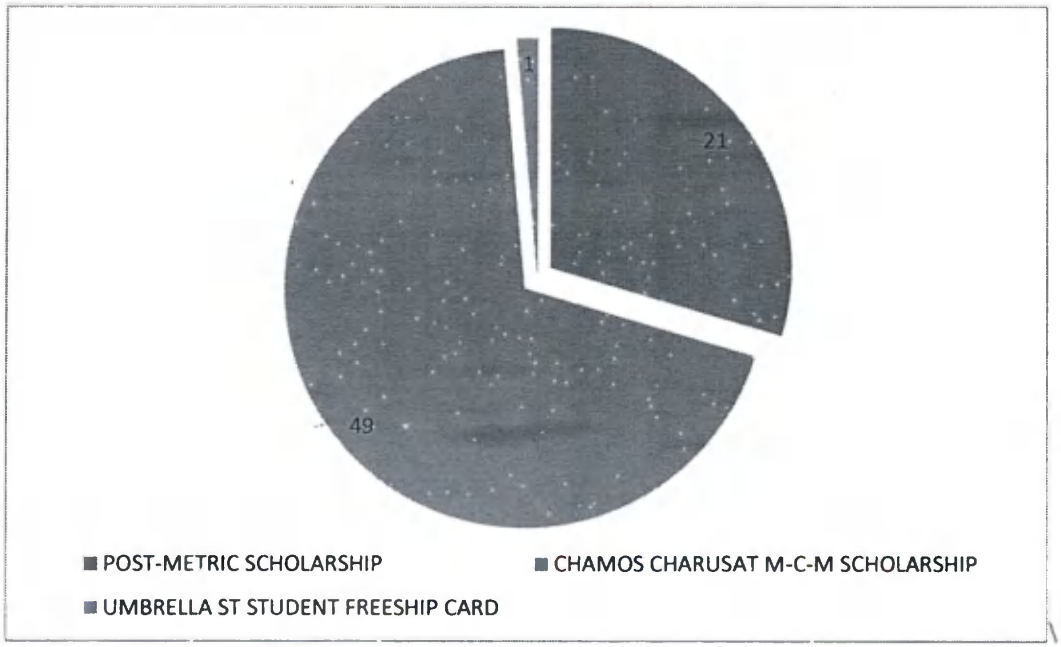
Scholarships and fellowships

Seventy one students benefitted by scholarship aided by government as well as institutional agency.



Research and Publication: 03

Title of paper published	Name of the author/s	Department of the teacher	Name of journal	National/International	Name of the publisher
Characterization of low molecular weight urinary proteins at varying time intervals in type 2 diabetes	**Dhara N. Patel1** and Kiran Kalia2*	Medical Laboratory Technology	Diabetology & Metabolic Syndrome	International	BioMed Central

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mellitus and diabetic nephropathy patients					
Variation In The Size Of Abdominal Aorta Measured On Computed Tomography	**Dolly Sharma,** priyanka Rao	Medical Imaging Technology	Asian Journal of pharmaceutical and Clinical Research (AJPCR)	National	Innovare Academic Sciences Pvt Ltd.
Column chromatography free purification of recombinant α-amylase from Bacillus licheniformis by tagging with hydrophobic Elastin Like Polypeptide	**Rekha C. Akhani,** Arti T. Patel, Manisha J. Patel, Samir R. Dedania, Jagdish S. Patel, **Darshan H. Patel**	Medical Laboratory Technology		National	Springer India

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Faculty Participation

Faculty Development Program

- CIPS faculty members Optom Yogesh Vaghela and Dr. Dhara Patel participated in **four day Learner and Learning program** organized at CHARUSAT from 23rd Aug 2018 to 26th Aug 2018.
- Dr. Dhara N. Jajal and Mr. Manna Debnath attended the **one week teaching learning program entitled as "Multiple strategies for creativity, problem solving and innovation"** organized by CHARUSAT on 25th Nov to 1st Dec 2018.
- Dr. Artee Tyagi and Ms. Amita Patel participated **four day international conference on Reproduction, Endocrinology and Development** organized by Navrachna University from 18th Jan 2019 to 21st Jan 2019.
- Dr. Rekha Akhani attended the **three day soft skill development program** organized by CHARUSAT on 16th -18th Jan 2019.
- Dr. Dhara Jajal and Dr. Rekha Akhani participated in **33rd Gujarat Science Congress state level conference** held on 2nd – 4th Feb 2019.
- Dr. Dhara Jajal participate in **three day workshop entitled "Teaching, Learning, and Material Production for Participatory Learning"** organized by CHARUSAT held on 25th-27th June 2019.
- Optom Jaydev Paragara and Optom Yogesh Vaghela attended **national conference "Gravity-2019"** organized by Ansal University on 3rd Dec 2018.
- Dr. Dhara Patel attended the **international conference "Artifical intellligence in Biotech & Health care"** organized by Biotecnika info lab pvt ltd. On 1st-2nd Dec 2018.
- Optom Jaydevsinh Pargara attended the **state level workshop "Myopia control"** organized by Association of schools & colleges of optometry held on 9th Dec 2018.
- Dr. Dhara Patel earned National Programme on Technology Enhanced Learning (NPTEL) course certificate for **"Application of interotomics using genomics and proteomics technologies"** course.

Resource person/ Guest speaker

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- **Ms. Dolly Sharma, Head of Medical Imaging Technology Dept.**, invited at two national conference organized by ISRT/JNMC/KLES with a title as National CME in medical imaging innovation on 16th Sept 2018 and NITTE university with a title 2nd national conference of NITTE imaging technology on the road to medical imaging on 17th Feb 2019.
- **Ms. Dolly Sharma, Head of MIT and Mr. Manna Debanth** both were invited for an eminent talk at state level conference Annual Conference and CME Program of ISRT Ahmedabad Academic club organized by Indian Society of radiographers & Technologists on 7th April 2019.
- **Mr. Manna Debnath, MIT Dept.,** invited for a talk in National conference "NCISRT 2018" organized by ISRT & KGMU on 27th and 28th Oct 2018.
- **Dr. Dhara Patel, Dr. Rekha Akhani and Mr. Debayan Baidya** judged the State level Science Manthan 2019 held at CHARUAT on 5th Jan 2019.

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CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF MEDICAL SCIENCES

CHAROTAR INSTITUE OF PARAMEDICAL SCIENCES

Event Report- Commencement program

Academic Year 2018-19

Charotar Institute of Paramedical Sciences (CIPS) a constituent of CHARUSAT has organized a commencement program for the new batch of academic year 2018-19. The program was scheduled on 12th July 2018 at MTIN Auditorium in the morning hours from 10:00am to 12:00pm.

The program started with a prayer adoring Goddess Saraswati. The commencement was facilitated by the presence of Dr. B. G. Patel, Provost, CHARUSAT and Dr. Devang Joshi, Registrar, CHARUSAT. All the Dignitaries were welcomed with the flower bouquet. Dr. Darshan Patel, Principal, CIPS addressed the vision and mission of the institute. Sir briefed out the importance of these programs initiated at CIPS. He also directed the students with clear visualization of allied healthcare professional for serving our society. Dignitaries gave the motivational speech and ended with the vote of thanks from Optom Yogesh Vaghela. After the refreshment, Mr. Debayan Baidya presented the brief introduction about the facilities at CIPS, extracurricular activities done at institute and university level and faculty introduction. Thereafter all faculty members interacted with the students.

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CIPS
CHAROTAR INSTITUTE OF PARAMEDICAL SCIENCES

Annual Report

Academic Year: 2017-2018

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CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY
Accredited with "A" grade by NAAC, Govt. of India

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CIPS JOURNEY SO FAR…

Charotar Institute of Paramedical Sciences (CIPS), a constitute of CHARUSAT, was established in the year 2015 with an aim to create next generation skilled health care professionals through quality education, extensive Clinical training to provide utmost excellence in health care delivery and Community services.

CIPS started with 3 undergraduate (UG) programs naming Bachelor of Science in Medical Imaging Technology (BMIT), Bachelor of Science in Operation Theater and Anesthesia Technology (BOTAT), Bachelor of Optometry in the academic year 2016-2017.In this Academic year 2017-2018, CIPS introduced one more new PG (postgraduate program) naming MSMLT (Master of Science in Medical Laboratory Technology). The UG programs were of four year duration (3 year of Academics and 1 year of clinical internship) and the PG program is of 2 year duration (1 year academics and I year research)

CIPS got a new blissful step of student progression with an infrastructure. Students got their own place/ building for the continuation of teaching leaning process. CIPS shifted to its own educational premises in March 2018.

Vision:

"To be a leading institute in the field of Allied Health Sciences with amalgamation of best Education, Research and Patient care."

Mission:

"To prepare skilled allied health care professional by high standard of education delivery, extensive clinical exposure and research.

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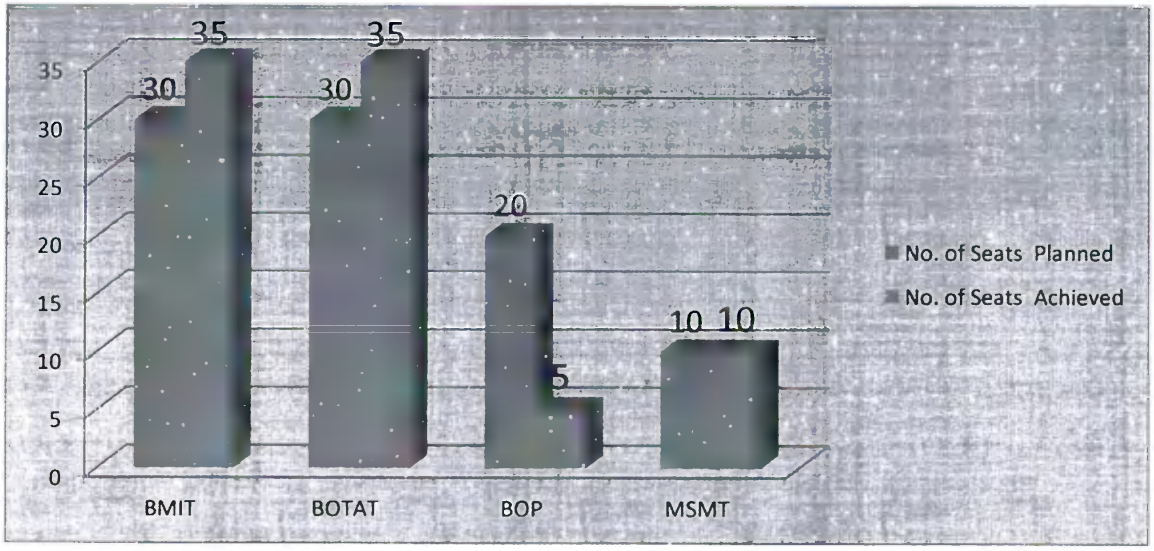
Admission Criteria

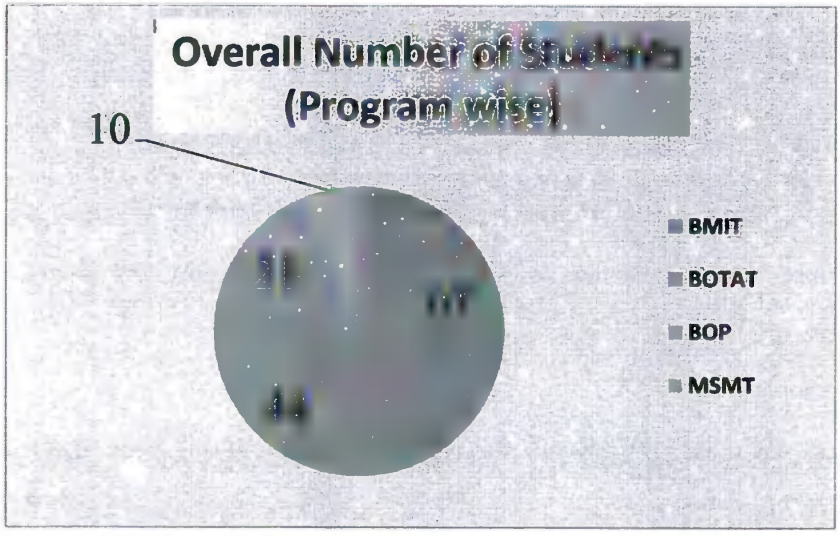
Eligibility criteria for all programs (BMIT, BOTAT, BOP) is ≥50% in PCB of 12th class and more than 60% students enrolled with more than 50% PCB marks

Eligibility criteria for PG program is ≥5 CGPA in UG and all students enrolled with 5 CGPA and above.

Student Enrollment

Eighty five students enrolled in the academic year 2017-2018.





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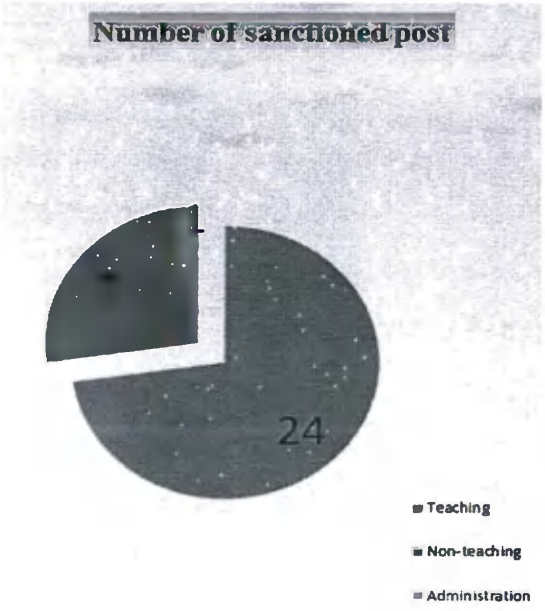
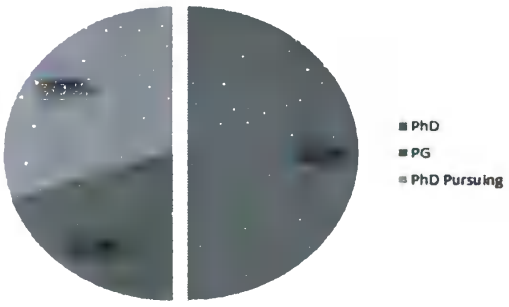
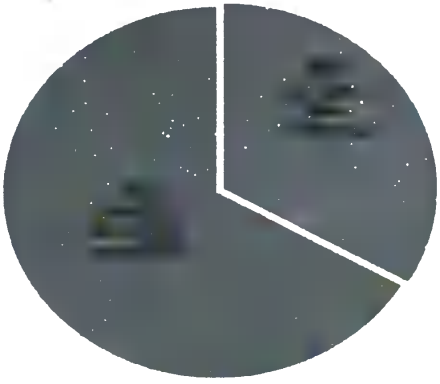
Faculty Strength

- Eight specialized teaching faculty recruited with the domain knowledge and technical skills to impart and fulfill the students' key essential with our mission.
- One administrative staff recruited for the smooth flow of admin work.



Bifurcation of teaching faculty





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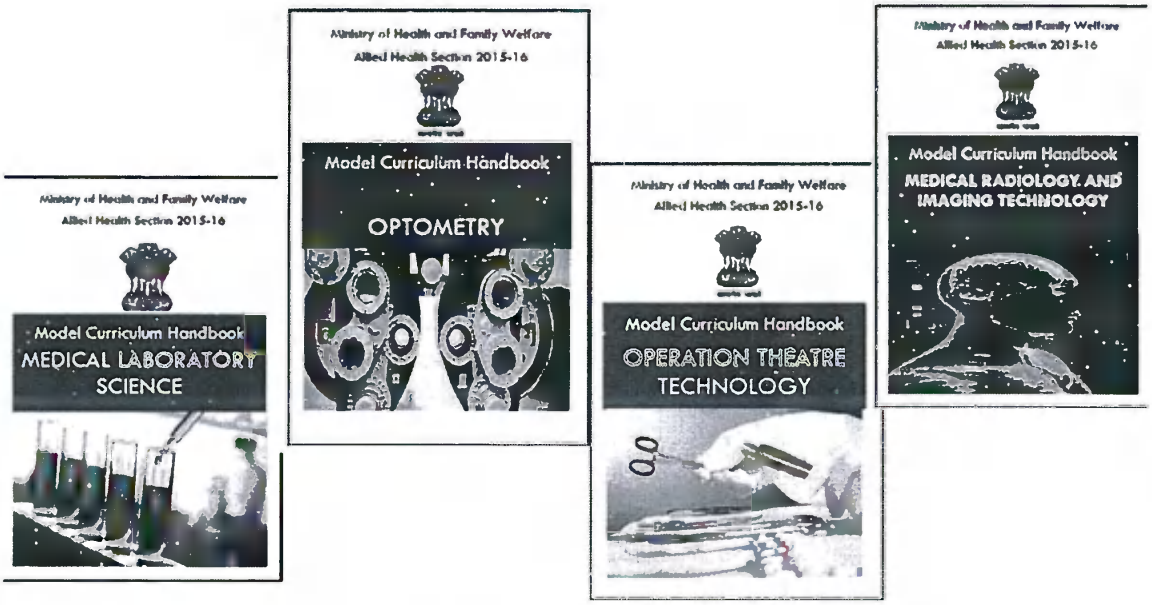
Curriculum Development

Teaching curriculum

- The core syllabus and teaching schemes were initially adopted from the national guidelines Ministry of Healthcare and Family Welfare (MoHFW), Allied Health Section 2015-2016.



- The choice based credit system learning adopted from the university.
- Therefore, the entire syllabus in all the programs of the institute is divided into three major components like:

  1. Core subjects
  2. Allied courses
  3. Elective, Soft skills & humanities

- Feedback from different stakeholders taken, analyzed and appropriate action taken for curriculum development.

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Teaching Learning Evaluation

Teaching learning practices:

- **Clinical postings**

  Teaching curriculum framed with more number of clinical hours to train students for clinical services and patient care.

- **Case studies and Presentations**
- **Educational tour** for MSc MLT students arranged on 14th November 2017 at Akanksha Hospital and Research Institute, Anand, Gujarat.
  - India's best IVF (in vitro fertilization) center.
  - One of the best surrogacy clinics in the world.
  - Students learnt different techniques and observed the machines manifested for successful IVF practices.
  - Learnt the functional role of other OPDs in Akanksha Hospital.
  - Learnt the role of molecular biology laboratory in the early diagnosis of a genetic inheritance disorder and its manipulation.

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- **Workshop**
  - Three day Workshop on "Embryology and Molecular lab techniques" was arranged at Akansha Hospital from 8th March to 10th March for our MSc MLT students. The students got Hands on training for molecular technique DNA Isolation and RT-PCR where they tested tissues for Endometrial Tuberculosis. They learnt techniques like PCR and next generation sequencing, cell culturing and monocyte isolation.

Workshop at Akansha Hospital

. **Evaluation**

- Internal and External Examination

  The traditional method of assessment followed for semester wise assessment system for the theoretical subjects.

- Clinical orientation, preparation of log book at stage II skill development was assessed by subject expert.

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UNIVERSITY EXAM RESULT

FIRST TERM 2017-2018

Program name	Semester	No. of students appeared	No. of students passed without backlog	No. of students with first class	No. of students with distinction
BMIT	3	33	24	23	18
BMIT	1	35	34	14	3
BOTAT	3	10	9	8	3
BOTAT	I	33	29	9	1
BOP	2	15	12	7	3
MSMLT	1	10	9	4	3

SECOND TERM 2017-2018 UNIVERSITY RESULT

Program name	Semester	No. of students appeared	No. of students passed without backlog	No. of students with first class	No. of students with distinction
BMIT	4	33	27	25	17
BMIT	2	34	30	18	5
BOTAT	4	10	10	7	3
BOTAT	2	33	19	9	0
BOP	2	15	12	10	5
MSMLT	2	10	10	6	3
BOP	3	15	9	8	3
BOP	1	5	4	4	2

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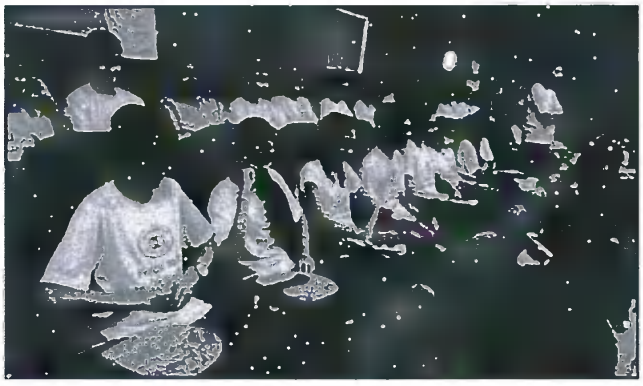
Events organized

- "World Sight Day" was organized by Department of Optometry held on 12th October 2017 in our campus.
  - Participants: All CIPS & IT students
  - We imparted the knowledge on "Far Sightedness" and its precautionary factors.
  - Optom. Jyoti Singh Dave was invitee lecturer, dispersed the awareness on "Galloping Myopia".
  - Optom. Yogesh Vaghela transmitted the facts on "Digital Eye strain".
  - Dr. Subhangi Koshta (Opthalmologist) entertained in Panel discussion.



- CIPS also celebrated in the "International Day of Radiology" organized by Department of Medical Imaging Technology held on 8th November 2017 in our campus.
  - Theme: "Radiation Safety awareness and Precautions"
  - Invitee: Dr. Deepak V. Mehta
  - Students were enrolled in poster presentation.
  - Different Radiation signage displayed to students to make them alert for Hazardous radiations.

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- Quiz participation of students.
- Radiation awareness through templates distribution.

Student Participation

- MSMLT students attended a National Conference on New Horizon on Cancer Biology on 16th to 17th March at JB auditorium, Ahmedabad Management Association.
    - Learnt different tumor markers for different types of cancer.
    - Application of droplet digital PCR technology
- Optometry students participated in "World Optometry Day 2018" held at B N Patel College, Anand on 23rd March 2018 with a theme "Optometry awareness". Students actively participated in Poster Presentation.

- Department of Optometry also actively participated the "World Sight Day 2017" organized by collaboration of Optometry council of India held at Nagar School of Optometry-Ahmedabad on 13th October 2017 with a theme "Make Vision Count". Students actively participated in the following events:
    - Walkathon for sight awareness,

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- Blindfold activity
- Pamphlet distribution to General hospitals (V.S and L.G hospitals) for sight awareness.
- Extension activity: Students made the participants aware of the importance of regular eye checkup, willingness for eye donation, sight saving activities and encouraged them to do the same regularly.

Walkathon Flagged off

Student of CIPS walkathon with Optom. Jaydevsinh Pargara

With Mr Jayantibhai Patel

Students showing eye opening banners

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Poster presented by CIPS

Pamphlet distribution

Students Achievement

- 3rd Sem BOP students won first prize presenting "Speciality of Optometry" in World Optometry Day 2018 poster presentation competition held at B N Patel College, Anand.
- 1st Sem BOP students got consolation prize presenting "Eye calender" in World Optometry Day 2018 poster presentation competition held at B N Patel College, Anand.
- BOP students won the first prize in World Sight Day 2017 poster presentation held at Nagar School of Optometry, Ahmedabad.

Professional Development Program:

- Dr. Prabhakar Sharma, Tenured Professor and Head, Nephrology Division from Texas Tech University, Texas, USA welcomed at CIPS on 18th -19th Dec'2017 to interact with the students and faculties regarding "Team approach and Avenues in Health Care System".

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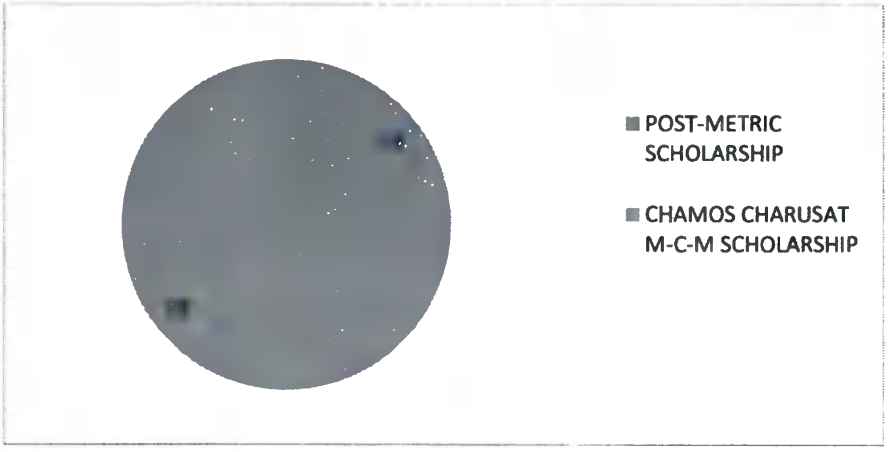
Scholarships and fellowships

Forty six students benefitted by scholarship aided by government as well as institutional agency.



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Faculty Participation

Faculty Development Program

- CIPS faculty members Optom Yogesh Vaghela and Dr. Dhara Patel participated in four day Learner and Learning program organized at CHARUSAT from 23rd Aug 2018 to 26th Aug 2018.
- CIPS faculty members Optom Yogesh Vaghela, Mr. Debayan Baidya and Mr. Alkesh Patel participated in one week teacher training program with a title "Creativity, problem Solving and Innovation" oganized at CHARUSAT from 13th Nov 2017 2018 to 22nd Nov 2017.
- Ms. Dolly Sharma attended the two day national conference for Teaching, Learning Methods in Health Professional Education organized by Shree Krishna Hospital, karamsad on 16th -17th Feb 2018.

Resource person/ Invited talk

- Dr. Darshan Patel, Principal, CIPS invited for a national conference entitled as "Chemistry of Materials and Biologicals" on 5th Jan 2018 organized by IIT Gandhinagar.
- Ms. Dolly Sharma, Head of Medical Imaging Technology Dept., visited as an invite in "National Conference for Radiological Technologist on Radiation Safety and Patient Care in Radiology" held at K.S. Hegde Medical Academy, Deralkatte, Manglore on 17th December 2017. And she gave a talk on the topic of "Radiation Safety for Pediatric patients".

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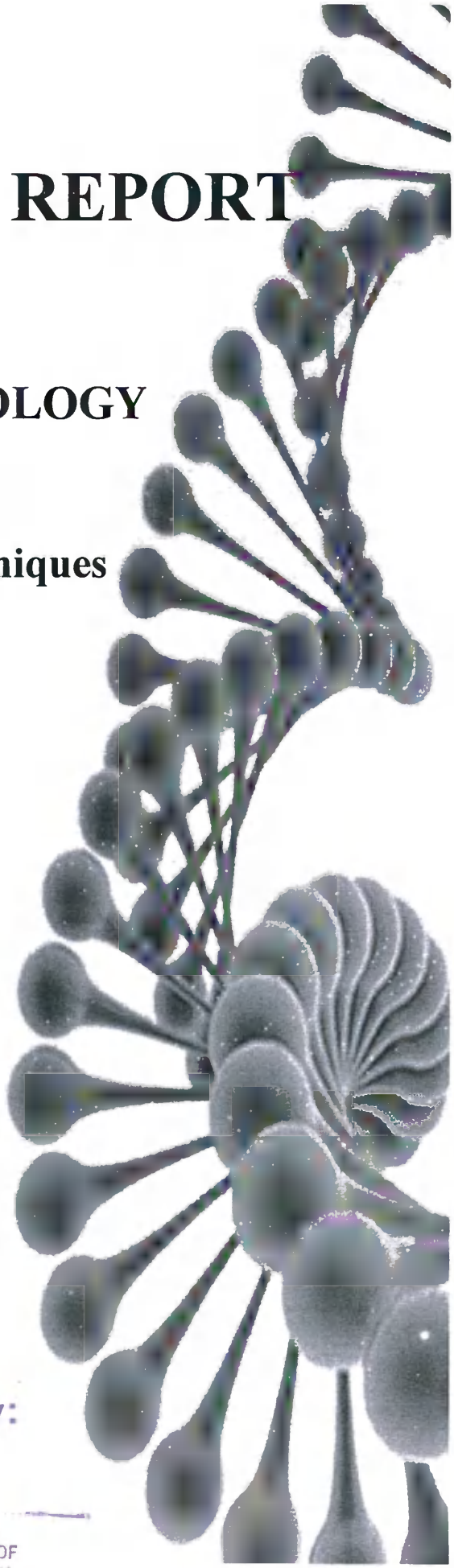
SUMMER TRAINING REPORT 2018

INDIAN INSTITUTE OF TECHNOLOGY GANDHINAGAR

Molecular Biology & Biophysical Techniques



Supervised by
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CERTIFICATE

This is to certify that the hands on training on **Molecular Biology and Biophysical techniques** is carried out by **Dimpy Patel** at the **Indian Institute of Technology Gandhinagar, Gujarat** under my supervision, during the period of **11th June 2018** to **11th July 2018**. IITGN is owner of the intellectual property associated to project.

Dr. Vijay Thiruvenkatam
Assistant Research Professor
Indian Institute of Technology Gandhinagar

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ABOUT THE TRAINEE

STATEMENT OF PURPOSE

I had done training on Molecular Biology and Biophysical techniques which help me to learn and practice more molecular biology techniques. This project also aware me with several regulation, norms which follows inside the labs and also give me idea how to communicates professionally inside labs. This intern would give me considerable experience in this field and much required guidance for my research career. Overall, experience at IIT Gandhinagar was impressive and I would like to take forward my studies here in the future.

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ACKNOWLEDGMENT

The satiation and gratification that accompany the successful completion of the project would be incomplete without the mention of the people who made it possible.

I would like to take the opportunity to thank and express my gratitude to my project advisor Dr. Vijay Thiruvenkatam who inspite of busy schedule has guided me the path whenever there was a need.

I am specially thankful to Ms. Nalini Natarajan and other students pursuing M. Tech. and PhD here for co-operating and guiding me continuously and indeed his valuable contribution and guidance have been certainly indispensable for my training.

I owe my wholehearted thanks and appreciation to the entire staff of the organization for their cooperation and assistance during the course of my training.

I hope that I can build upon the experience and knowledge I have gained and make a valuable contribution towards this field in coming future.

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BACTERIAL TRANSFORMATION

- Bacterial transformation is a process in which cells take up foreign DNA from the environment.
- So, after transformation, the cells have potential to express the genetic information and act as a source of genetic diversity.
- Transformation is that process which used to introduce recombinant plasmid DNA into bacterial cells so, it made competent for DNA uptake.
- Steps in bacterial transformation are:
    - i. Preparation of competent cell
    - ii. Transformation
    - iii. Plating

i. Preparation of competent cell

E.coli is the most common bacterial species used in the transformation step of a cloning workflow. Since the natural competency of E. coli is very low or even nonexistent, the cells need to be made competent for transformation by heat shock.

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a. A single fresh colony of the desired strain is taken from an agar plate and inoculated into liquid medium for a primary culture , three broth were prepared (LB broth , LB broth with ampicillin , LB broth with kanamycin) & incubated overnight for 250rpm at 37°C .

b. From primary culture take 3ml media & add to 100ml flask containing medial for secondary culture , these subsequent larger culture are carefully monitored for active growth by continually measuring OD at 600nm (To obtain high transformation efficiency, it is crucial that cell growth be in the mid-log phase at the time of harvest which generally occurs at OD_{600} between 0.4 and 0.6) .

c. When OD reaches at 0.6 then transfer the culture to centrifuge bottles & centrifuge at 4000rpm for 10 min at 4°C.

d. Pellet resuspended in solution I (10ml of 0.1M $CaCl_2$) & incubated in ice for 10min , Centrifuge at 4000rpm for 10min at 4°C.

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e. Resuspended the pellet in solution II (0.1M $CaCl_2$ + 15% glycerol)

f. Aliquot 50 µl cell in sterile 1.5ml tubes & store in -80°C .

ii. Transformation

The method for bacterial transformation is heat shock for chemically prepared competent cell . When ready for the transformation step, competent cells should be thawed on ice and handled gently to retain viability. Cells can be mixed by gentle shaking, tapping, or pipetting, but vortexing should be avoided.

a. Take 50 µl of competent cell & add 1 µl plasmid in it (100ng/ µl) .

b. Mix by tapping , incubate it for 20min in ice .

c. Then give heat shock for 90sec in dry bath (so the pores were created) .

d. Again kept it into ice for 10min

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e. 200 µl of SOC media added to 50 µl cells (S.O.C. media used in transformation to get higher transformation efficiency of plasmid)

f. Incubate for 1 hr at 37 °C in shaker

iii. Plating

After cells grown in S.O.C. media, cells are plated on LB agar with ampicillin for identification and recovery of successful transformants.

a. After incubation take 100 µl of transformed cell & transfer to petri plate.

b. To spread sterile plastic spreader is used (plates having ampicillin in it, so those cells are grow that having plasmid in it.)

c. Incubate at 37 °C for overnight.

d. Culture plates are examined next day for colony formation.

e. Prolonged incubation is avoided, because it often results in fusion of large colonies.

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f. Take those plates and cover it with parafilm (for long-term storage)

iv. Inoculation

a. Prepare 10ml LB browth(0.2g in 10 ml MQ water) , autoclave it .
b. Also take those plate having transformed cells in hood
c. Take sterile plastic loop , pick up 2-4 colony from plate and inoculate into the LB browth
d. incubate at 37°C with shacking at 225rpm for overnight.

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PLASMID ISOLATION(MINIPREP)

a. Pellet 1-5 ml bacterial overnight culture by centrifugation at >8000 rpm for 3 min at RT.

b. Resuspend pelleted bacterial cells in 250 µl Buffer P1 & transfer to a microcentrifuge tube.

c. Add 250 µl Buffer P2 & mix thoroughly by inverting the tube 4-6 times until the solution becomes clear. Do not allow the lysis reaction to proceed for more than 5 min.

d. Add 350 µl Buffer N3 & mix immediately & thoroughly by inverting the tube 4-6 times.

e. Centrifuge for 10 min at 13,000 rpm in a table-top microcentrifuge

f. Apply the supernatant from step 5 to the QIAprep spin column by decanting or pipetting, centrifuge for 30-60sec & discard the flow-through.

g. Recommended: Wash the spin column by adding 500 µl Buffer PB, centrifuge for 30-60sec & discard the flow-through.

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h. Wash the QIAprep spin column by adding 750 µl Buffer PE, centrifuge for 30-60sec & discard the flow-through.

i. Centrifuge for 1min to remove residual wash buffer.

a. Place the QIAprep column in a clean 1.5 ml microcentrifuge tube. To elute DNA add 50 µl Buffer EB (10mM Tris-cl, pH8.5) or water to the center of the QIAprep spin column, let it stand for 1 min & centrifuge for 1min.

b. Store at 4°C.

c. Measure plasmid concentration by Nanodrop .(concentration should be greater then 100ng.

TSC1	219ng/µl
TSC2	281ng/ µl
$TSC1^m$	490ng/ µl
$TSC2^m$	504ng/ µl

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AGAROSE GEL ELECTROPHORESIS

- Agarose is a highly purified linear polysaccharide molecule that derives from seaweed & it has been widely used in the detection of plasmids & linear DNA fragments.
- Plasmids sizes ranging from less than one kilo-base (kb) to over a few hundred kb can be resolved by agarose gel electrophoresis.
- Under the influence of an electric field motility of different DNA species through a gel are inversely related to their respective molecular sizes.
- Therefore, those having larger in size will move slowly & those fragments having lesser in size will migrate faster in gel after applying an electric field.
- For plasmid there are three different type of confirmation is there : (i) Supercoil

  (ii) Open circular (OC)

  (iii) Covalently closed circular(CCC)

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PROCEDURE:

a. Agarose gel preparation: weight 0.4-gram agar powder dissolve in 40ml of 1X TAE buffer and heat it by microwave for 1min.

b. Cool down the solution add 2.5 µl of EtBr (dye for visualization of DNA & it gives fluorescence).

c. Mix it properly, pour the solution in gel casting tray, add gel comb to create wells, let it solidify. leave it for 15-20 min.

d. comb removed, Put the gel with wells facing the BLACK negative electrode. the gel is covered by TAE buffer in the tank.

e. Load 3 µl of DNA ladder.

f. Take parafilm and stick to the platform it is used to mix the DNA sample with Loading Dye.

g. Take 2 µl of loading dye put the drop to parafilm, take 2 µl of DNA sample, mix it by gentle pipetting.

h. Take 3 µl of that mixture and Load it in well

i. Different DNA sample used: GFP, YFP, CFP, $Rheb^{b}$, $Rheb^{m.}$

j. Connect the electrodes to the power supply set it for 80 volt

k. Allow it run for 30 min.

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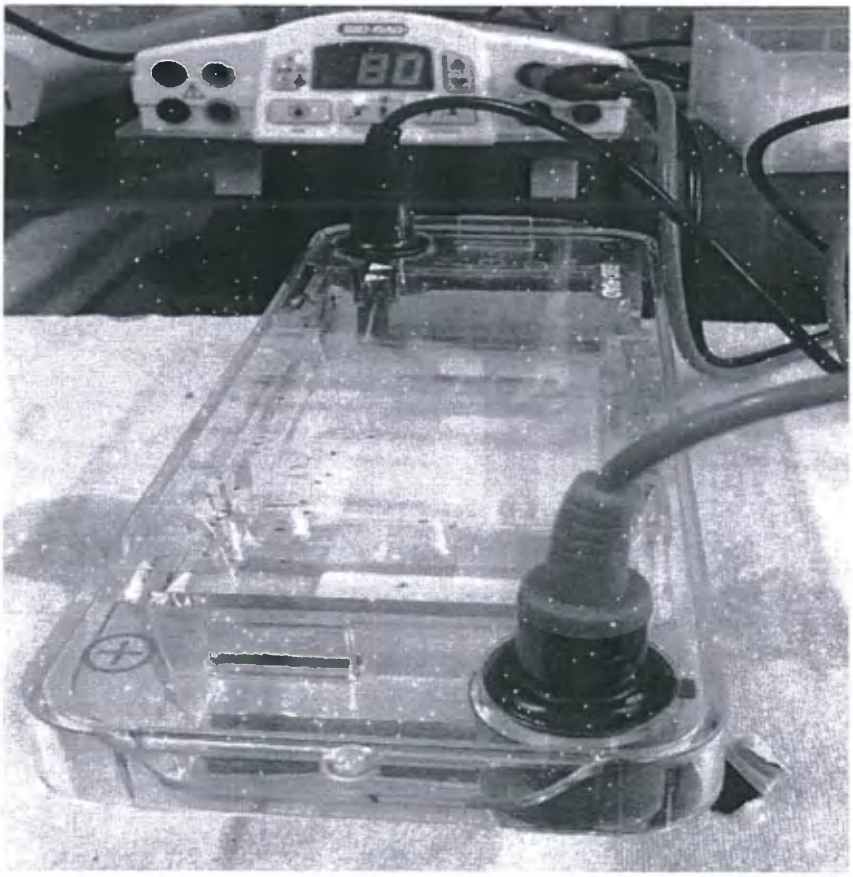
l. After electrophoresis , disconnect the power supply , take the gel to the Gel doc system for visualization of bands under (UV filter)

m. Allow it to run for 30min.



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RESTRICTION DIGESTION

- Restriction digestion of recombinant plasmid gives a fast sequence information.
- Multiple plasmid can be analyzed for the presence or absence of an insert, plasmid size.
- Purified plasmid DNA is digested with one or more restriction enzymes selected to give a different DNA band pattern that is easily resolved by agarose gel electrophoresis.

PROCEDURE

a. Set up the following reaction :

Ingredients	Double digestion		Ingredients	Single digestion	
	TSC1	TSC2		$TSC1^m$	$TSC2^m$
Buffer	2.5µl	2.5 µl	Buffer	2.5 µl	2.5 µl
Templet DNA	2.28 µl	1.78 µl	Templet DNA	1.02 µl	0.99 µl
MQ water	19.72 µl	20.22 µl	MQ water	20.98 µl	21.01 µl
Enzyme(BamH1 + EcoR1)	0.5 µl + 0.5 µl	0.5 µl + 0.5 µl	Enzyme (EcoR1)	0.5 µl	0.5 µl
Total	25 µl	25 µl	Total	25 µl	25 µl

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b. Incubate it for 1hr at 37 °C

c. Perform agarose gel electrophoresis

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PROTEIN EXPRESSION USING BL21 (DE3)

- Ecoli cells for protein expression

PROCEDURE:

Primary inoculation-

a. 20 gm. of Luria Broth (LB) were added in 1000ml of milli q water. So 0.3 gm. of Luria Broth (LB) was required for preparation of 15ml of primary media.

b. Prepared primary media was autoclaved for sterilization for 60 minutes.

c. 15µl of ampicillin of concentration (100µl/ml) was added in the primary media and also transformed cells[BL21 (DE3)] was added to the primary media.

d. Incubate this media for 12hrs at 37°c.

Secondary inoculation20 gm. of Luria Broth (LB) were media.

a. Secondary media was autoclaved for sterilization purpose at 60 minutes.

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b. Only 1% of primary culture was used for the preparation of the secondary culture. Thus 1L of media and 10ml of primary culture with 1ml of ampicillin of concentration (100µl/ml) were added.

c. Incubate this secondary media until the OD reaches at 0.6 to 0.8 at 600nm then after 0.5mM of IPTG was added and incubate it for 9 hrs. at 25°c.

Peletting

a. The secondary culture was pelleted in centrifugation bottle at 45mins of 10000 rpm at 4°c.

b. Freezing & thawing is done for lysis of bacteria for that Resuspend this pellet in 5-5ml of lysis buffer , then take that pellet into the falcon tube , then start Freezing & thawing procedure .

c. This obtained pellet was stored at -80°c.

d. Give heat shock

e. After that put it into frezze

f. Sample in frozen condition perform sonication for 20 min.

g. After that go for GST-Affinity chromatography.

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PREPARATION OF LYSIS BUFFER

S.No	Ingredient	Required	Stock
1	NaCl	50mM	2M
2	EDTA	0.5mM	5mM
3	Tris-Cl	1M	50mM
4	PMSF	1mM	0.2M

Lysis the pellet by using of Lysis buffer-

Pellet resuspended in lysis buffer then sonicate this solution in ultra sonicator by setting the parameter as 20min, pulse on for 5min, and pulse off for 5min

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GST- AFFINITY CHROMATOGRAPHY

- Affinity chromatography is based on the unique property of extremely specific biological interactions to achieve separation and purification of analytes. Such biological interactions are those between antigen and antibody, enzyme and substrate, receptor and ligand.
- particles that are uniform, spherical and rigid are used , The most common ones are the cross-linked dextrans and agarose, polyacrylamide, polymethacrylate, polystyrene, cellulose and porous glass & silica.
- Protein purification with the help of affinity tags such as glutathione S-transferase (GST) for protein purification .
- GST is a 211 amino acid protein (26 kDa) and its DNA sequence is integrated into expression vectors to produce recombinant proteins.
- After expression from this vector we get GST-tagged fusion protein in which the functional GST protein (26 kDa) is fused to the N-terminus of the recombinant protein.

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- GST-tagged fusion proteins is purified based on the ability of GST (an enzyme) to bind to its substrate, glutathione (GSH).
- Glutathione is a tri peptide (Glu-Cys-Gly) that is the specific substrate for glutathione S-transferase (GST).
- When reduced glutathione is immobilized through its sulfhydryl group to a solid support, such as cross-linked beaded agarose, it can be used to capture pure GST or GST-tagged proteins via the enzyme-substrate binding reaction.
- Binding is most effective by neutral buffers& conditions such as Tris-buffered saline (TBS) pH 7.5. Because binding depends on preserving the essential structure and enzymatic function of GST, protein denaturants are not compatible.
- After washing affinity column to remove non-bound sample components, the purified GST-fusion protein can be dissociated and eluted from a glutathione column by addition of excess reduced glutathione. The free glutathione

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competitively changes the immobilized glutathione binding interaction with GST, allowing the fusion protein to emerge from the affinity column.

- This affinity system commonly yields greater than 90% pure GST-tagged recombinant protein from crude bacterial or mammalian cell lysate samples..

- When the GST tag is not necessary as part of the recombinant protein after purification, it can be removed if a cleavage site for a specific protease is included between the protein and GST tag in the design of the DNA vector. For example, HRV 3C protease specifically cleaves the sequence Leu-Glu-Val-Leu-Phe-Gln-↓-Gly-Pro .

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PROCEDURE

a. Preparation of buffer

- Preparation of equilibrium buffer , wash buffer (pH7.4)

S.No	Ingredient	Required(200ml)
1.	PBS	198ml
2.	EDTA	2ml
3	PMFS	300µl

- PBS + EDTA (pH7.4)

S.No	Ingredient	Required (100ml)
1.	PBS	98ml
2.	EDTA	1ml

- Preparation of Desalting buffer (pH7.5)

S.No	Ingredient	Required (200ml)
1.	Tris-cl	10ml
2.	EDTA	0.4ml
3	Nacl	15ml
4	BME	100µl

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- Preparation of Glutathione buffer (pH8.0)

S.No	Ingredient	Required (100ml)
1.	Tris-cl	2.5ml
2.	Glutathione	0.3080 g

- **For PBS**

S.No	Ingredient	Required (1000ml)
1.	Nacl	8 g
2.	KCl	0.2g
3	Na_2HPO_4	1.44 g
4	KH_2PO_4	0.24 g

b. Resin (store at 4°C with 20% ethanol)

c. Apply 50 ml of 1X PBS

d. After that wash it with 30 ml of Elution buffer.

e. Then add 50 ml of Equilibration buffer

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f. After that sample were added (lysate)

g. Again wash it with 50m of Equilibration buffer .

h. Wash it with 50 ml of PBS+EDTA.

i. Wash it with 50ml of desalting buffer.

j. On-column cleavage with HRV.3C protease

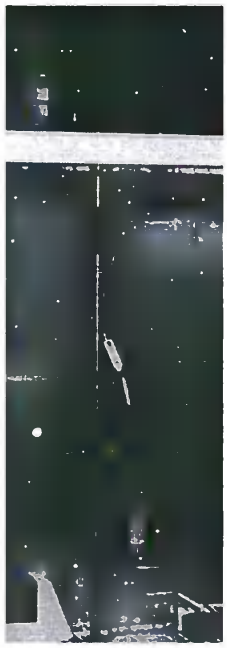
k. Wash it with desalting buffer and the protein fraction were collected .(lable with TSC)

l. After adding elustion buffer fraction were collected (labble with GST).

m. Protein concentration were measured by nenodrop

n. After that SDS-PAGE was performed

FRACTION 1	0.315mg/ml
FRACTION2	0.92 mg/ml



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SODIUM DODECYL SULPHATE-POLYACRYLAMIDE GEL ELECTROPHORESIS

SDS-PAGE

- In SDS-PAGE , SDS added to remove this structure and turn the molecule into an unstructured linear chain whose mobility depends only on its length and mass-to-charge ratio
- SDS is an anionic detergent applied to protein samples to linearize proteins and to impart a negative charge to proteins.

COMPONENTS

1. **Acrylamide** (C_3H_5NO; mw: 71.08): When dissolved in water, slow, spontaneous polymerization of acrylamide takes place, joining molecules together by head on tail fashion to form long single-chain polymers. Gel formation requires linking various chains together. Acrylamide is a neurotoxin. It is also essential to store acrylamide in a cool dark and dry place to reduce autopolymerisation and hydrolysis

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2. **Bisacrylamide: (N,N′-Methylenebisacrylamide)** ($C_7H_{10}N_2O_2$; mW: 154.17): Bisacrylamide is the most frequently used cross linking agent for polyacrylamide gels Chemically it can be thought of as two acrylamide molecules coupled head to head at their non-reactive ends. Bisacrylamide can crosslink two polyacrylamide chains to one another , there by resulting in gel .
3. **Sodium Dodecyl Sulfate (SDS)** ($C_{12}H_{25}NaO_4S$; mW: 288.38): (only used in denaturing protein gels) SDS is a strong detergent agent used to denature native proteins to unfolded, individual polypeptides. When a protein mixture is heated to 100 °C in presence of SDS, the detergent wraps around the polypeptide backbone. It binds to polypeptides in a constant weight ratio of 1.4 g SDS/g of polypeptide. In this process, the intrinsic charges of polypeptides become negligible when compared to the negative charges contributed by SDS. Thus polypeptides after treatment become rod-like structures possessing a

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uniform charge density that is same net negative charge per unit weight. The electrophoretic mobilities of these proteins is a linear function of the logarithms of their molecular weights. Without SDS, different proteins with similar molecular weights would migrate differently due to differences in mass-charge ratio, as each protein has an isoelectric point and molecular weight particular to its primary structure. This is known as Native PAGE. Adding SDS solves this problem, as it binds to and unfolds the protein, giving a near uniform negative charge along the length of the polypeptide

4. **Ammonium persulfate (APS)** ($N_2H_8S_2O_8$; mW: 228.2): APS is a source of free radicals and is often used as an initiator for gel formation. An alternative source of free radicals is riboflavin, which generated free radicals in a photochemical reaction.
5. **TEMED (*N, N, N′, N′*-tetramethylethylenediamine)** ($C_6H_{16}N_2$; mW: 116.21):

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TEMED stabilizes free radicals and improves polymerization. The rate of polymerisation and the properties of the resulting gel depend on the concentrations of free radicals.

6. **Loading aids**: Most PAGE systems are loaded from the top into wells within the gel. To ensure that the sample sinks to the bottom of the gel, sample buffer is supplemented with additives that increase the density of the sample. These additives should be non-ionic and non-reactive towards proteins to avoid interfering with electrophoresis. Common additives are glycerol & sucrose

7. **Tracking dye**: As proteins and nucleic acids are mostly colorless, their progress through the gel during electrophoresis cannot be easily followed. Anionic dyes of a known electrophoretic mobility are therefore usually included in the PAGE sample buffer. A very common tracking dye is Bromophenol blue (BPB, 3', 3", 5', 5" tetra

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bromophenol sulfonphthalein). This dye is coloured at alkali and neutral pH and is a small negatively charged molecule that moves towards the anode. Being a highly mobile molecule it moves ahead of most proteins. As it reaches the anodic end of the electrophoresis medium electrophoresis is stopped. It can weakly bind to some proteins and impart a blue colour. Other common tracking dyes are xylene cyanol, which has lower mobility, and Orange G, which has a higher mobility.

8. **Coomassie Brilliant Blue R-250 (CBB)** ($C_{45}H_{44}N_3NaO_7S_2$; mw: 825.97): CBB is the most popular protein stain. It is an anionic dye, which non-specifically binds to proteins. The structure of CBB is predominantly non-polar, and it is usually used in methanolic solution acidified with acetic acid. Proteins in the gel are fixed by acetic acid and simultaneously stained. The excess dye incorporated into the gel can be removed by destaining with the same solution without the dye. The proteins are

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detected as blue bands on a clear background. As SDS is also anionic, it may interfere with staining process. Therefore, large volume of staining solution is recommended, at least ten times the volume of the gel

COMPONENT MIXTURE

STACKING GEL						
COMPONENTS 5%	**WATER**	**30%ACRYLAMIDE**	**TRIS 1.0 M pH6.8**	**10% SDS**	**10%APS**	**TEMED**
2 GEL (4ML)	2.7ml	670µl	500 µl	40µl	40µl	4µl
RESOLVING GEL						
COMPONENTS 12%	**WATER**	**30% ACRYLAMIDE**	**TRIS 1.0 M pH8.8**	**10% SDS**	**10%APS**	**TEMED**
2 GEL(10ml)	3.3ml	4.0ml	2.5ml	100 µl	100 µl	4 µl

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1. **Make the separating gel:**

   a. Set the casting frames (clamp two glass plates in the casting frames) on the casting stands.

   b. Prepare the gel solution.

   c. Swirl the solution gently but thoroughly.

   d. Pipet appropriate amount of separating gel solution into the gap between the glass plates.

   e. To make the top of the separating gel be horizontal, fill in water into the gap until an overflow.

   f. Wait for 20-30min to let it solidify .

2. **Make the stacking gel:**

   a. Make stacking gel solution .

   b. Pour the solution until it overflow from plates .

   c. Insert the comb to form well , Wait for 20-30min to let it solidify.

   d. Make sure a complete solidification of the stacking gel take place and take out the comb.

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3. Pour the running buffer (electrophoresis buffer) into the inner chamber and keep pouring after overflow until the buffer surface reaches the required level in the outer chamber.

4. Prepare the samples:_Take 5 µl of loading dye & 20µl of protein sample in tube , Heat the mixture for 5-10 min in hot plate.

5. Load prepared samples into wells and make sure it not overflow

6. Load protein ladder in first lane Then cover the top and connect the electrode .

7. Set an120 V for 90min , let the sample to run .

8. Staining & Destaining procedure:

- Immerse the gel with staining solution and slowly shake it on horizontal rotator for about 20-30min.
- Immerse the gel in destaining solution and put it on the same shaker for about 20-30min.
- Change the destaining solution for 3-5 times untill you can see clear bands with almost no blue background.

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STAINING SOLUTION
0.3 % Coomassie Brilliant Blue
45 % Methanol (v/v)
10% Glacial acetic acid
45 % water

DESTAINING SOLUTION
20%Methanol
10% Glacial acetic acid
70% water

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WESTERN BLOTTING

- Western blotting the transfer of protein to solid membrane from gel
- Western blot is used to identify specific protein & also provide information about protein size in the sample .

PROCEDURE:

a. Remove the gel from the gel cassette.

b. Fill the tray with blotting buffer, it will be used to equilibrate gel for 15min on rocking platform before starting western blot.

c. Presoak fiber pad in blotting buffer

d. To make blotting sandwich, take container to fit the gel holder & also for sufficient amount of buffer fill in it .

e. Place the gel holder cassette in the container with the black side down and it sub-merged in the buffer and the white side up, place one fiber pad on the black side

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f. Put one piece of blotting paper and place it on the top of the pad , (be careful to avoid any bubble between the pad and paper) make sure that the buffer cover the paper

g. Take the gel & carefully place into the blotting paper (Be careful to avoid any bubble between the gel and paper)

h. Take nitrocellulose membrane & wet the membrane with blotting buffer , place on the gel (avoid moving the membrane once place it on gel because process of blotting is start)

i. Using the roller remove any air bubble between the gel & membrane .

j. Place the second wet blotting paper on the top of the nitrocellulose membrane

k. Place a second fiber pad on the top of the blotting paper

l. Close the gel holder .

m. Insert the gel holder into the blotting module with the black side of the cassette facing the black side of the blotting module , add frozen cooling unit.

n. Place transfer buffer to the tank

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o. Place the lid on the top of the cell

p. Connect the cable to power supply 20 V , 150 min

q. When the run is complete turn off the power supply and disassemble the electrophoresis chamber .

r. Open the cassette and put it on to the buffer

s. Remover each layer until reach to the nitrocellulose membrane as we remove the membrane note that the protein is transfer to the nitrocellulose membrane (ladder is seen on both side of membrane)

t. Immerse the membrane into the 25ml blocking solution & incubate for 15min at RT on rocking platform , pour off the blocking solution

u. Add 10ml of primary antibody incubate for 10-20min on rocking platform , pour off the primary antibody

v. Rinse the membrane with 15ml of wash buffer & discard the wash buffer

w. Add 15ml of wash buffer let it be for 15min on rocking platform . discard the wash buffer

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x. Add 10ml of secondary antibody and the incubate the membrane for 2hr on rocking platform ,pour off the secondary antibody rinse the membrane with 15ml of wash buffer , and discard the wash buffer , repeat 3 times

y. Add developing solution in dark room because it is light sensitive (**ECL substrate** an enhanced chemiluminescent substrate for detection of horseradish peroxidase (HRP) activity from antibodies)

z. Detect and image the protein

1. TBST	
Tris –cl (pH7.4)	10Mm
Nacl	0.9% w/v
Tween 20	0.02%w/v

2. **Blocking buffer** : 5% w/v skim milk in 1 X TBST

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3. TRANSFER BUFFER	
Tris	25Mm
Glysine	192Mm
Methanol	20%
SDS	0.03%

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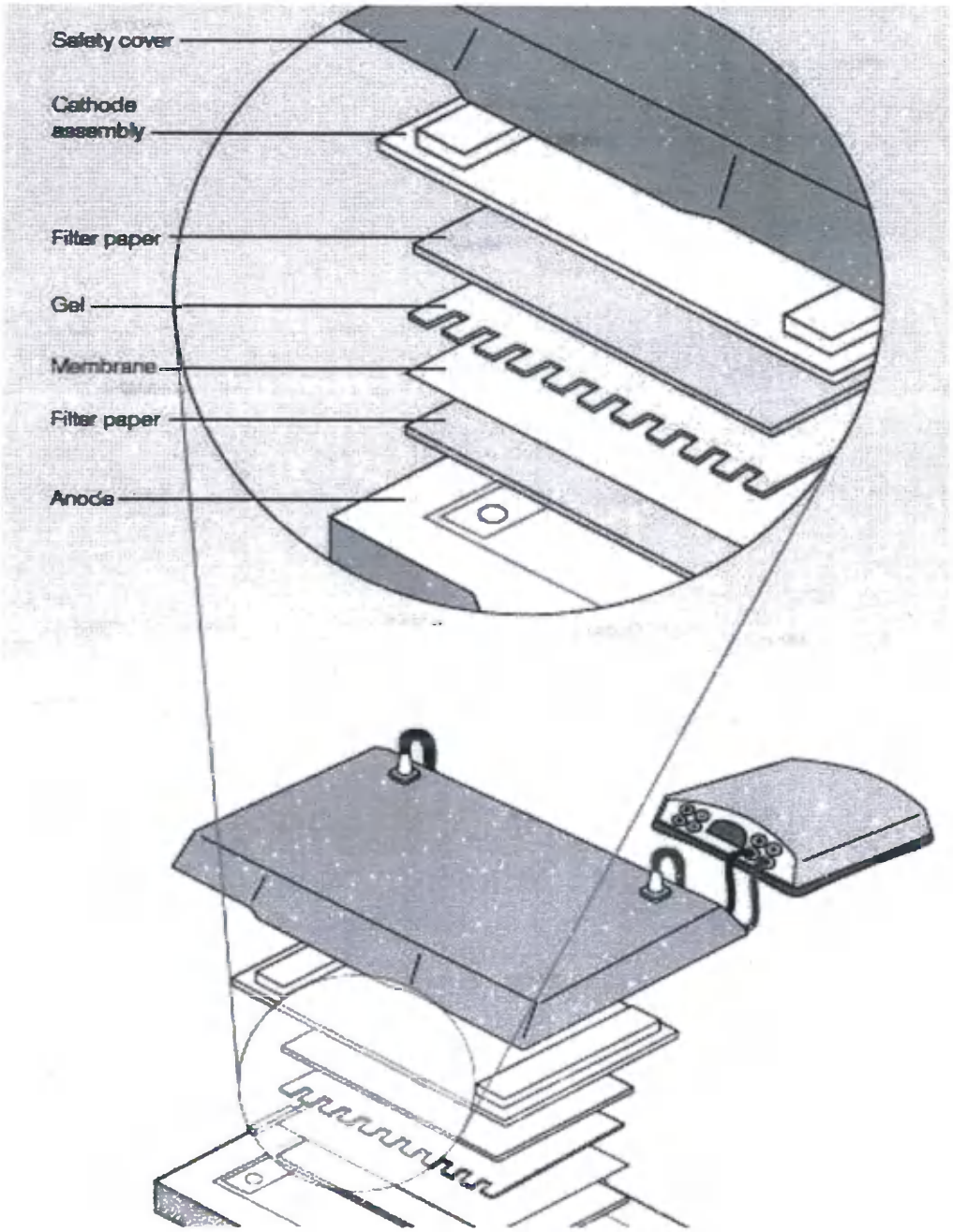

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REFERANCE

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CIPS
CHAROTAR INSTITUTE OF PARAMEDICAL SCIENCES

SUMMER TRAINING REPORT-2018

Duration:- 4th June 2018 to 15th June 2018

Done at

S.S. HOSPITAL, PETLAD

Submitted by

Ms. Kushani Girishbhai Bhaine

M.SC. first year

(MEDICAL TECHNOLOGY)

ID:-17MSMT001

Under the guidance of

Dr. Amar Pandya

Microbiologist

S S Petlad Hospitat

Co-guided by

Dr. Artee Tyagi

Assistant professor

Charotar Institure of Paramedical Science

Charotar University of Science and Technology

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Declaration:-

I, the undersigned Kushani Girishbhai Bhaine, the student of Charotar Institute of Paramedical Sciences affiliated to Charotar University of Science and Technology, Anand, hereby declare that these fifteen days training report at S.S. HOSPITAL, PETLAD is based on my own learning from the routine work held there and the report has been prepared by my own understanding and sincere efforts. It has not been previously submitted.

Signature:_____

Ms. Kushani

ID :

Chaortar Institute of Paramedical Science

Charotar University of Science and Technology

Date : _____

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About S.S Hospital…

Year Of Establishment :- 1970

Address:- S.S hospital-petlad, anand

Location:- anand ,gujarat, India

Zip code:-380007

Enquiries:-02697224422

Introduction & Overview:- district level hospital , multispeciality including all speciality

Microbiology Department:-

- Microbiologist: Dr. Amar Pandya
- Lab assistant:- Bhoomi C. Patel
- Lab attendant:- Bharat Thakor

Index
Sr. no.
Topic/ chapter
Observation
Work performed

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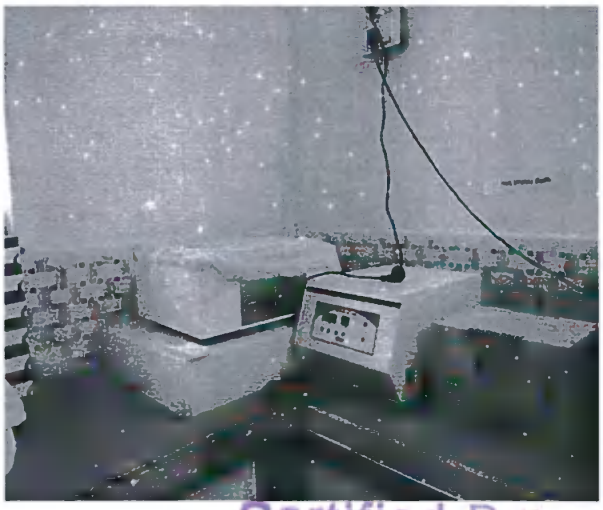
Microbiology Laboratory:-



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Tests performed in this laboratory

No.	Name of test	Purpose of test
1	VDRL Rapid test-RPR test	Syphilis
2	HIV test	HIV-AIDS
3	Sputum for AFB	TB
4	VIDAL Slide test	Typhoid
5	Dengue (IgM antibody) test	For Dengue fever
6	Dengue (Ns1 Antigen) test ELISA	For Dengue fever
7	Rheumatoid factor-(RA)	For joints(Pain, Inflammation)
8	ASLO	For bacterial infection of the bones
9	HBsAg(Rapid test)	For liver infection
10	Serum. CRP	Infection
11	Hepatitis- A ELISA IgM Antibody	Viral hepatitis
12	Hepatitis- E ELISA IgM Antibody	Viral hepatitis
13	Cholera culture-antibiotic sensitivity	For cholera
14	Blood culture-antibiotic sensitivity	For blood infection
15	Diphtheria culture-antibiotic sensitivity	For diphtheria
16	Measles- ELISA IgM Antibody	For measles
17	Chikengunia- ELISA IgM Antibody	Chikengunia
18	HCV Antibody	For Hepatitis B
19	Leptospirosis- (Rapid antibody)	Leptospirosis
20	Urine pregnancy test- (UPT)	Pregnancy
21	Urine culture-antibiotic sensitivity	Urine infection
22	Stool for OVA and Cyst	Parasite

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Equipment used

Auto claves

Hot air oven

Refrigerator

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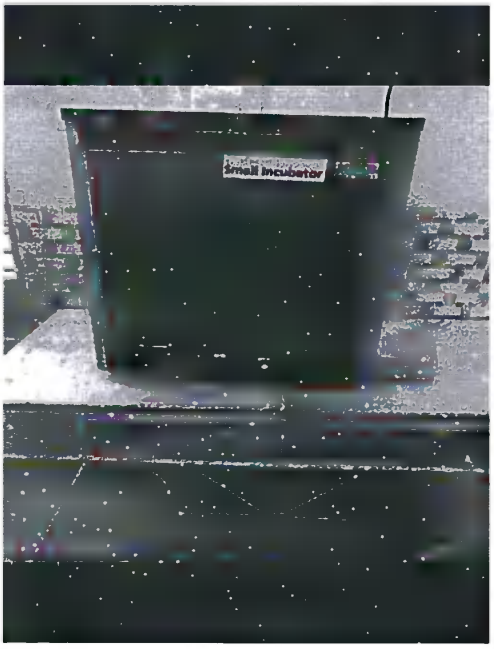
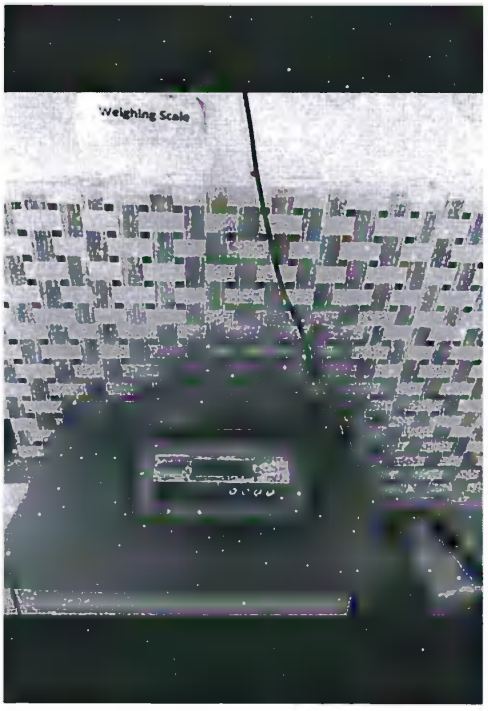


Incubators



Microscope

Weighing machine

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Dr

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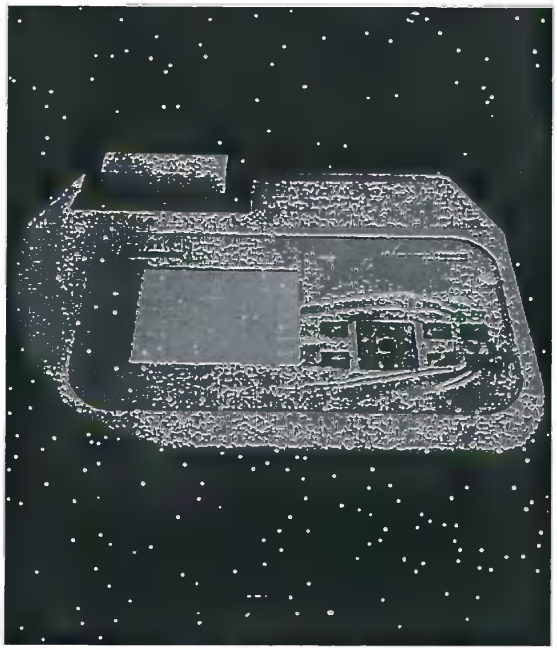

ELISA plate Analyser

Micro plate Washer

Laminar Air flow

Centrifuge machine

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Staining methods performed

- Staining methods like Gram's stain, Acid-fast stain and Albert's stain were performed in this lab.

1) **Gram's staining:-**
   a. Make a smear, dry in air.
   b. The smear is fixed by passing the slide over flame 2-3 times quickly.
   c. Cover the slide by **crystal violate solution** and allow to act for about **1 minute**.
   d. Pour off staining under the running water and cover the slide with fresh **iodine solution** and to act for **2 minutes.**

- Pour off stain under running water and decolorize with **100% acetone.** Decolorization is very rapid and is usually complete within **2-3 seconds**. After this period of contact, wash thoroughly with water under a running tap.
- Enter the counter stain **0.5 % safranine for 30 seconds.**
- Wash with water and blot dry and examine under oil immersion lens.

2) **Acid-fast staining:-**

- Make a smear, air dry and heat fix. (for the sputum take yellow purulent portion of the sputum).
- Place the fixed slide on staining rack with the smeared slide facing upwards.
- Pour filtered **1% carbon fuchsine** over the slide so as to cover the entire slide.
- Heat the slide underneath until vapors start rising. Do not let carbon fuchsine to boil or slide to dry. Continue the process up to **5 minutes**.
- Allow the slide to cool for **5-7 minutes.**
- Gently rinse the slide with tap water to remove the excess carbon fuchsine.
- Decolorize the stained slide by pouring **25% sulphuric acid** on the slide and leaving the acid for **2-4 minutes**. Repeat the decolorizes process **3-4 times** until pink color subsides from smear.
- Counter stain the slide by pouring **0.1% methylene blue solution** on to slide and let it stand for **1 minute**.
- Gently rinse the slide with the tap water and tip the slide to drain off the water, dry it and see under oil immersion lens.

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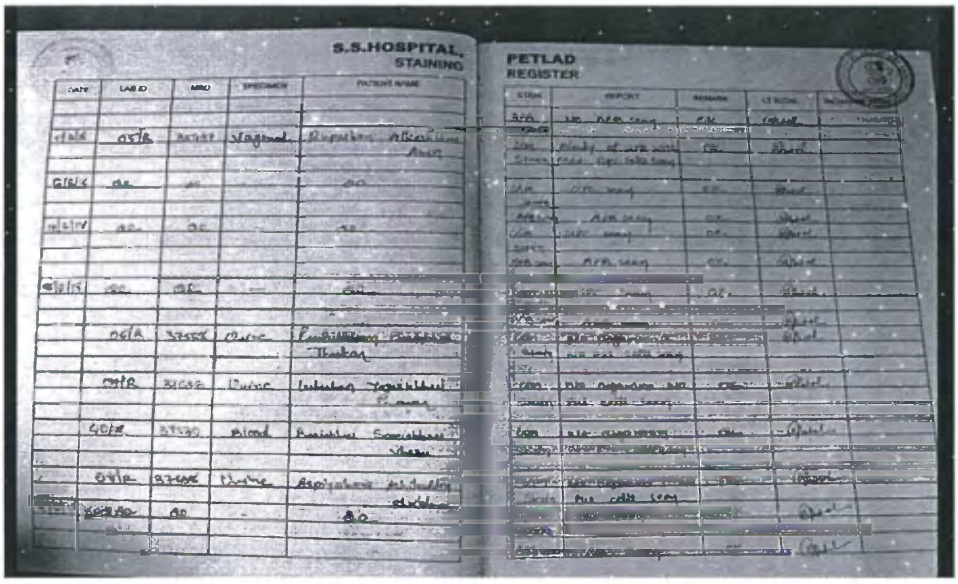
3) Albert's staining:-

- Make a smear, dry in air, and fix by heat.
- Cover slide with albert's stain-1 and leave for 4-5 minutes.
- wash in water and blot dry.
- Cover the slide with albert's stain-2 and allow acting for 1-2 minutes.
- Wash, blot dry and examine under oil immersion lens of microscope.

Staining area



Staining register

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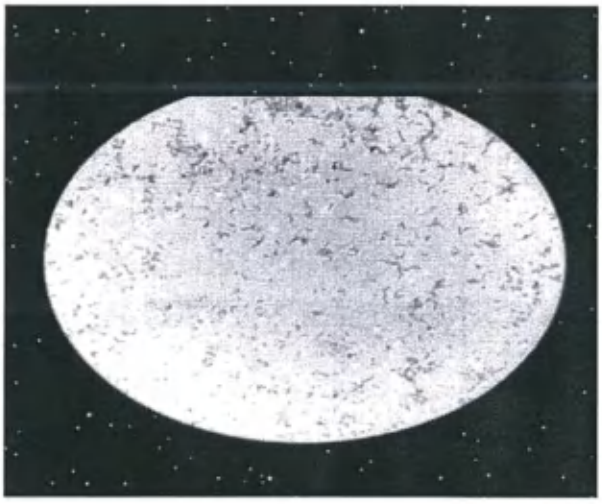
Observations:-

- Work we have observed within the laboratory.
- Patient's Registration:- (in the registration of the patient, lab assistant mentions the Specimen, Name of the patient, Stain and Result)

1) 4th June...

➢ **Sample:-** Sputum
(Appearance :- salivary)

- **Gram Staining**:- GPC (Gm+ve Cocci) bacteria observed.



(In paired and short chain)

- **AFB Staining:-** Acid Fast Bacteria are seen in the sample
- **In Microscope:-**Few pus cells and epithelial cells are observed.

Culture Plate	Colony Characteristics
1. MacConkey's plate	No growth
2. Blood agar plate	Mix growth
3. Chocolate agar plate	No optochin resistance found

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- **Colony Gram Stain**:- GPB (Gm+ve Bacilli) observed.

- **Result**:- GPB and AFB are seen in the sample.
- **Conclusion:-** From the above result it can be concluded that the sputum sample of the patient is TB positive.

➢ **Quality control for water analysis:-**
- **Gram staining:-** GPC are observed
- **Result:-**

	MPN/100 ml	**MPN/100 ml**
	Dhuvaran	Kalamsar
Coliform conf. at 37°c (BGBB)	>180/100ml	35/100 ml
Gas pro. At 44°c	04/100ml	8/100 ml
Indole at 44°c	22/100ml	24/100 ml

(MPN Presumptive Test Positive)

- **Conclusion:-** Both results of the samples are unsatisfactory. So, the drinking water is not potable.

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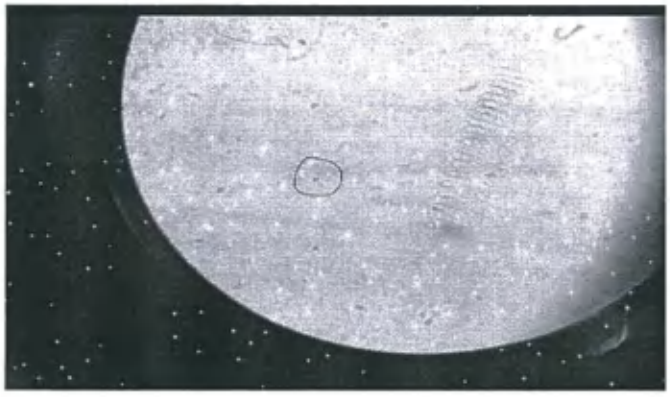
2) 5th -6th June...

- **Sample:-** Pus
- **Gram staining:-** Gram Positive Cocci singly and in pair seen with no pus cells.



(In single and in pairs)

- **AFB Staining:-** AFB negative
- **Anaerobic Incubation Jar:-** It was performed on blood agar and chocolate agar plate to observe haemolysis process. It is to keep in the jar for 24 hours.

- Anaerobic chambers, also known as **anaerobic glove boxes**, are atmosphere control units designed to be used when working with oxygen sensitive materials, product containment needs, and/or general isolation control.

- A process of free from spore-bearing bacteria. Bunsen burner. used to work aseptic on the bench. **Candle jar**. historically used for anaerobiosis; a lit **candle** was placed in as air-tight **jar** such that when it went out it would be because it used up all the available oxygen.

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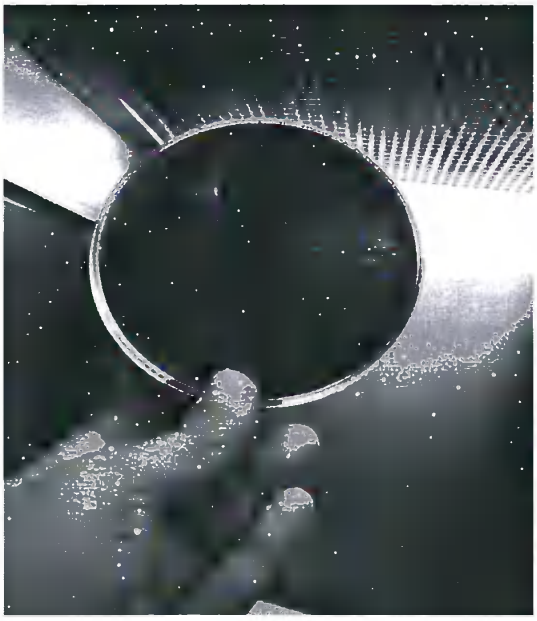
(Anaerobic Incubation Jar)

- **Result :-** After 24 hours incubation, the **beta haemolysis** is observed on the blood agar plate.



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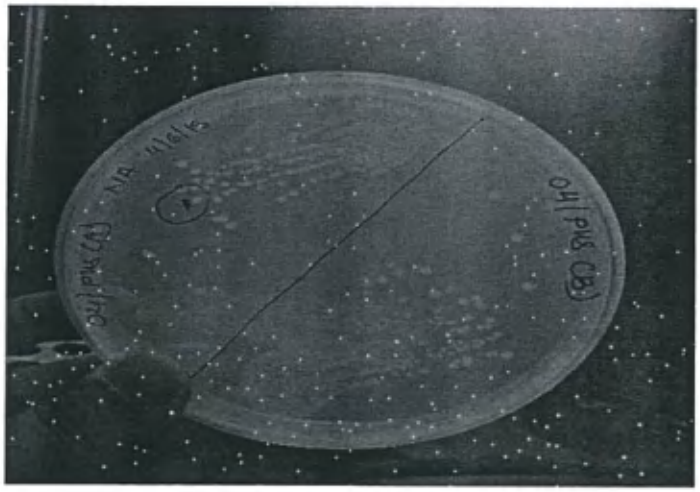
- **Result on N-agar plate:-**



Culture plate	Colony characteristics	Follow up
1. N-agar plate	Small, round, golden yellow colonies	Coagulase Biochemical sensitivity
2. MacConkey's Plate	No growth	
3. Blood agar plate	Small, round, white, B-hemolysis seen	

- **Colony gram stain:-** GPC (Gm+ve Cocci) bacteria seen.

- **Biochemical tests:-**

Test	Result
1. Catalase	Positive
2. Coagulase	Slide and Tube both positive
3. Sugar 1%	positive

- **Catalase Test:-**
  If the bacteria possess **catalase** (i.e., are **catalase-positive**), when a small amount of bacterial isolate is added to hydrogen peroxide (H2O2), bubbles of oxygen are observed. The catalase test is done by placing a drop of hydrogen peroxide on a microscope slide.

  Generally 6% H2O2 is used in the test but for the regular microbiological analysis, 3% H2O2 is used.

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In this case the pus sample is **Catalase Positive.**

- **Coagulase Test:-**

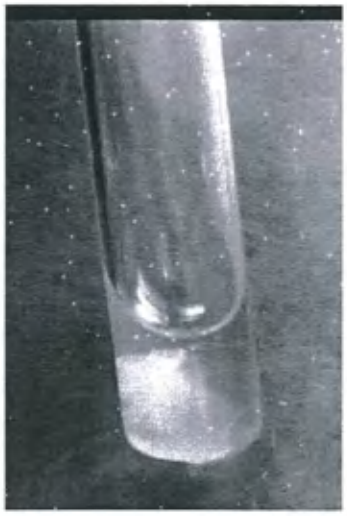
Coagulase test is used to differentiate ***Staphylococcus aureus*** (positive) from Coagulase Negative Staphylococcus (CONS). Coagulase is an enzyme produced by *S. aureus* that converts (soluble) fibrinogen in plasma to (insoluble) fibrin.
S. aureus produces two forms of coagulase, bound and free.

1. **Slide coagulase test** is done to detect bound coagulase or clumping factor.
2. **Tube coagulase test** is done to detect free coagulase.

- **Tube coagulase test:-**

1- Take 600 micro litre Plasma in the tube which is derived from EDTA vacutainer.
2- Add 1000 micro litre Normal Saline in that.
3- Pass the colony in the solution and incubate it.
4- Observe the clump formation in every hour for four times.
5- If clump formation seen after 4 hours, put it at normal room temperature.
6- And after that if clump formation is seen than, it could be concluded that the Coagulase Test is Positive.
7- Agglutination indicates a positive test:

- Indicates *Staphylococcus aureus.*
-



(Positive tube Coagulase)

- **Slide coagulase test:-**
1- Put 2 drops of Normal Saline on the both sides of the slide.

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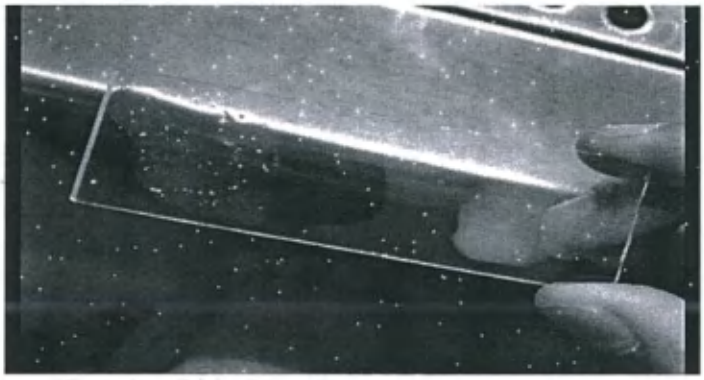
2- Add colony in drops and mix it well till it becomes milky white coloured.
3- Add more numbers of colonies.
4- Add Plasma in it and mix it well for 2 minutes.
5- Observe Agglutination.
6- Agglutination indicates a positive test:

- Indicates *Staphylococcus aureus.*

- **Note**: All coagulase negative slides must be confirmed using tube coagulase test as the definitive test for ***S. aureus.***

- In this case the pus sample is **Slide Coagulase Positive**.



(Positive Slide Coagulase)

- **Antibiotic susceptibility test (AST):-**

Antibiotic sensitivity or antibiotic susceptibility is
the susceptibility of bacteria to antibiotics. Because susceptibility can vary even within a species (with some strains being more resistant than others), antibiotic susceptibility testing (AST) is usually carried out to determine which antibiotic will be most successful in treating a bacterial infection in vivo.

- **Method:-**

Testing for antibiotic sensitivity is often done by the **Kirby-Bauer** method. Small wafers containing antibiotics are placed onto a plate upon which bacteria are growing. If the bacteria are sensitive to the antibiotic, a clear ring, or zone of inhibition, is seen around the wafer indicating poor growth.

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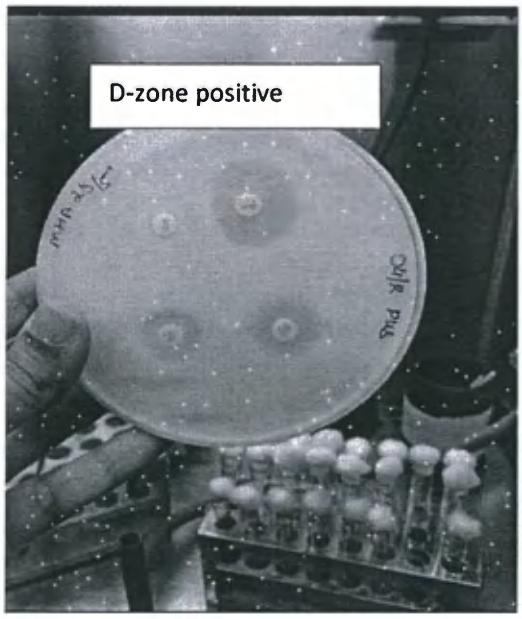
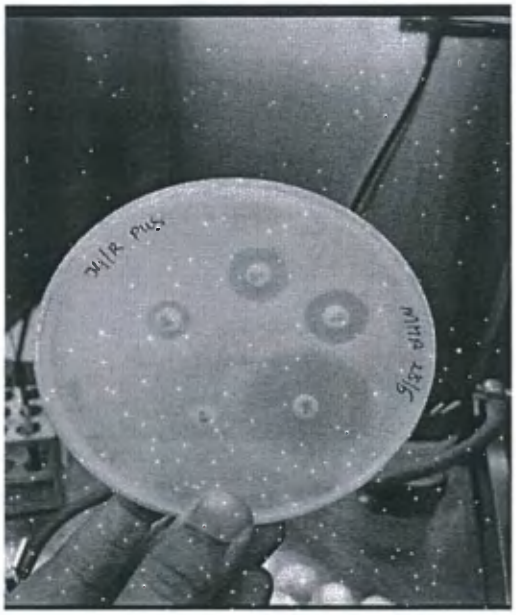


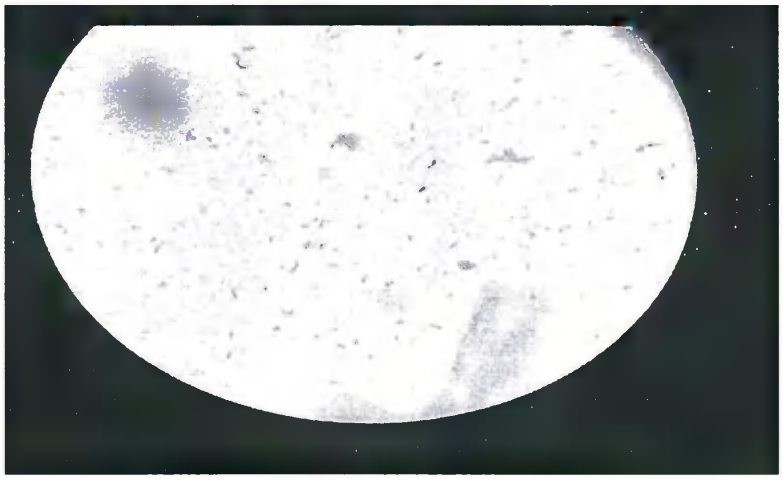


- **Result:-** The organism is resistant to all antibiotics accept '**Cotrimoxazole**' and **linezolid'**(sensitive).

- **Conclusion:-** From the above test results , a found organism was ***' Staphylococcus aureus'*** in the pus sample of patient.

➢ **Sample:-** Vaginal

- **Gram staining:-** GPB (Gm+ bacilli) bacteria observed



- **In microscope:-** Moderate epithelial cells were seen.
- **AFB Staining:-** Negative

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Culture plate	Colony characteristics
1.N-agar plate	No growth
2. MacConkey's plate	No growth
3.Blood agar plate	No growth

- **Result:-** No pathogen isolated after 48 hours aerobic incubation.

3) **7th June...**

➢ **Peptone water preparation :-**
Peptone water is a microbial **growth medium**. The pH of the medium is 6-7 and is rich in tryptophan. Peptone water is also a non-**selective** broth medium which can be used as a primary enrichment medium for the growth of bacteria.

- Take a loopful of organism and add it in to the peptone water and make a suspension.
- After 2 hours of incubation use this suspension and streak on to the plate.

➢ Quality control for water analysis:-

- **Gram staining:-** GPC are observed
- **AFB Staining**:- AFB positive
- **Result:-**

	Khadol
	MPN/100 ml
Coliform conf. at 37°c (BGBB)	180/100 ml
Gas pro. At 44°c	35/100 ml
Indole at 44°c	Positive

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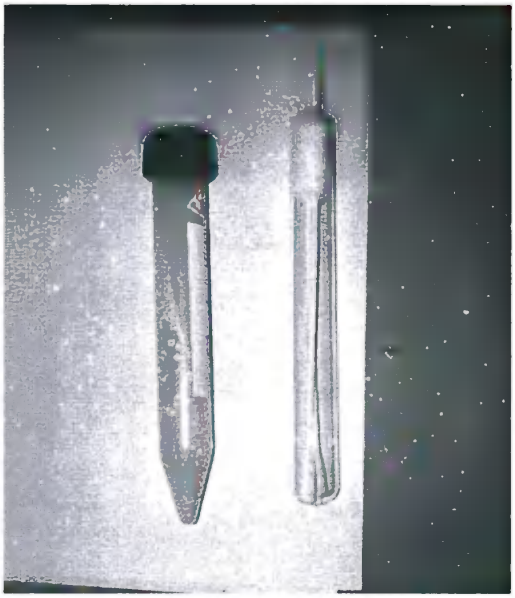
(MPN Presumptive Test Negative)

- **Conclusion:-** Result of the sample is unsatisfactory. So, the drinking water is not potable.

➢ **VTM (Virus Transfer Medium):-**

It is used for the throat swab for saline flue.



composition

4) 8th June...

➢ **Sample:-** Urine

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(**Appearance :-** Turbid)

- **Gram staining:-** Gm-ve
- **In microscope:-** No pus cells observed

Culture plate	Colony characteristics
1.CLED plate	No growth

- **Result:-** No pathogenic organism seen.

➢ **Sample:-** Urine

(**Appearance:-** Clear)

- **Gram staining:-** Gm-ve
- **In microscope**:- No pus cells observed

Culture plate	Colony characteristics
1.CLED plate	No growth

- **Result:-** No pathogenic organism seen.

➢ **Sample:-** Urine

(**Appearance:-** Clear)

- **Gram staining**:- Gm-ve
- **In microscope**:-No pus cells observed
-

Culture plate	Colony characteristics
1.CLED plate	No growth

- **Result:-** No pathogenic organism seen.

➢ **Sample:-** Blood

- **Gram staining**:- Negative
- **In microscope:-** No pus cells observed.

- **Blood culture**:-

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- Blood culture is most probably incubated for 7 days.
- But some other blood cultures are incubated for 24 hours.
- The bottle which is used for the adult blood culturing..

- **Result:-** Till 5th day of blood culturing, it was negative.

- **Day 1**- smear+ streak to NA/MAC/BA/CA
- **Day 2-** no growth
- **Day 3**-smear+streak to NA/MA/BA/CA
- **Day 4**-no growth
- **Day 5**-no growth

- **Conclusion :-** No pathogenic organism found.

➢ **Quality control for water analysis:-**

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- **Gram staining**:- GPC (Gm+ve Cocci) bacteria observed
- **AFB Staining**:- AFB positive
- **Result**:-

	Khadodhi	**Bajipura**
	MPN/100 ml	**MPN/100 ml**
Coliform conf. at 37°c (BGBB)	<1/100 ml	<1/100 ml
Gas pro. At 44°c	<1/100 ml	<1/100 ml
Indole at 44°c	<1/100 ml	<1/100 ml

- **Conclusion**:- Both results of the samples are negative. So, the water is excellent for drinking.

5) 9th June…

➢ **Sample:-** Urine
(Appearance:- Turbid)

- **Gram staining**:- GPC (Gm+ve Cocci) + [redacted] observed.
- **In microscope**:- Moderate number of GPC in single and few pus cells
- **Biochemical Tests**:

Test	**Result**
1. Citrate	Negative
2. TSI	A+/A+G+
3. Sugar 1%	Suc/Mal/Man/Lac/Dex A+G+
4. Indole	Positive

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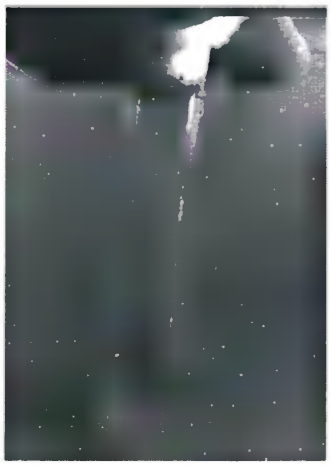
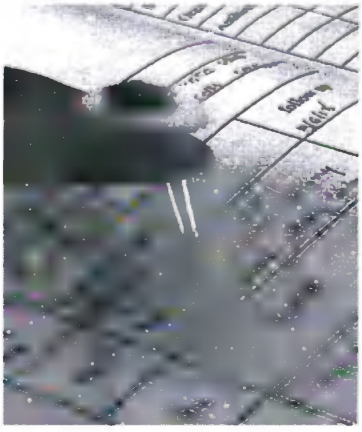
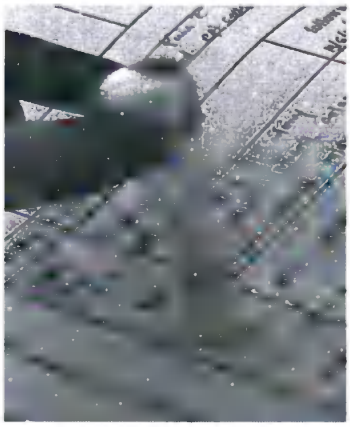
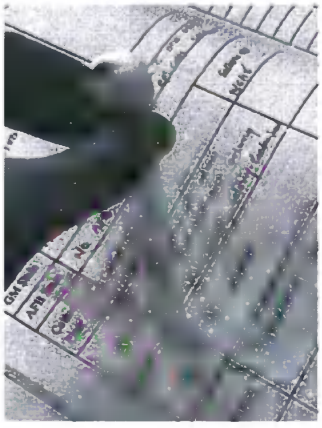


(TSI Positive) (Indole Positive) (Dextrose Positive)







(Mannitol Positive) (Lactose positive) (Maltose Positive)

Culture plate	Colony characteristics
1.CLED plate	Small, round, LF colony

- CLED agar lactose fermenting growth :-
  (colour change:- Green to Yellow)

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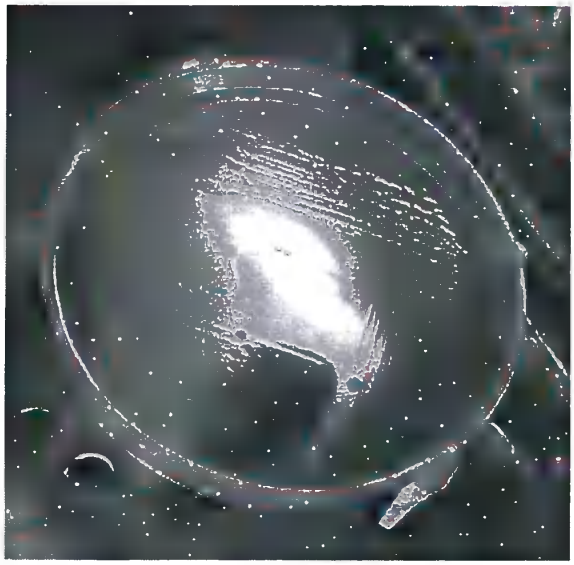

- **Colony Gram stain:-** GNB (Gm-ve Bacilli) bacteria seen.
- **Result**:- *E.coli* > 100000 CFU/ml is observed.
- **Conclusion:-** From the above results it can be concluded that the urine sample is having ' ***Escherichia coli'*** bacteria.

➢ **MPN (Most Probable Number) Presumptive Test:-**

Single stranded/ double stranded

The MPN test is a statistics-based test which estimates the number of fecal coliforms in a water sample based on the degree of lactose fermentation by organisms in the sample. In this test, a series of tubes of phenol red lactose broth are inoculated with measured amounts of water to determine if the water contains any lactose-fermenting bacteria that produce gas.

If, after incubation, **fermentation** plus **gas production** is demonstrated, it is presumed that coliforms are present in the water sample. Three types of results can be there..

1- Acid and Gas Production:- Color change of solution indicates Acid Production. And Gas production in Durham Vial indicates indicates positive gas production.

So, it indicates positive fecal coliforms in given sample.

2-Acid Production:- **Absence** of gas in the Durham tube. Even though the pH indicator has changed , gas must be produced for a positive result.

So, it indicates negative fecal coliforms in given sample.

3- No Production of Acid and Gas:- Absence of both color change and gas production indicates negative result.

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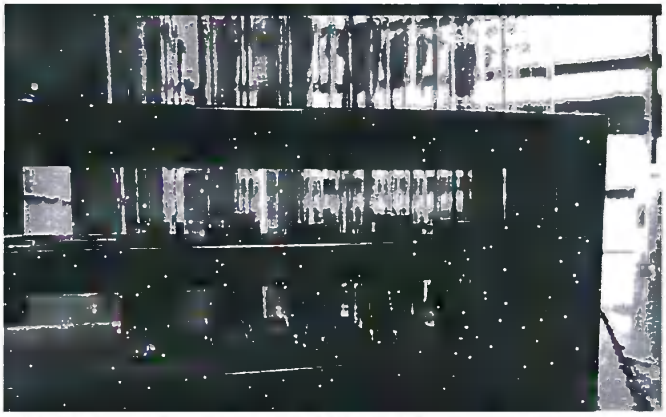
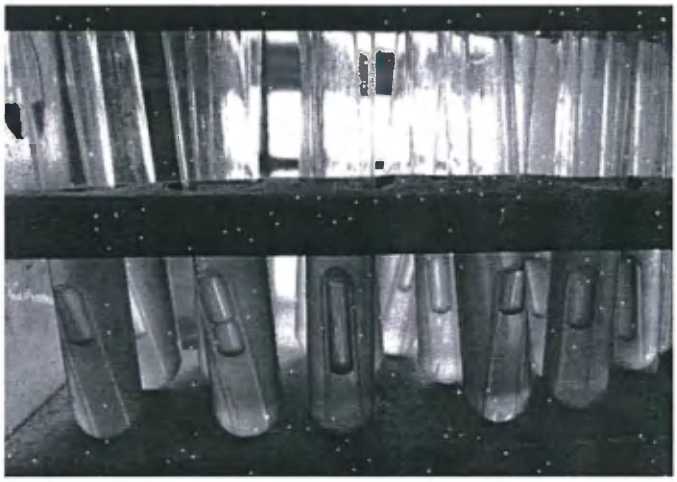
So, it indicates negative fecal coliforms in given sample.

- **Media are used for MPN method:-**

- **BGBB-** Brilliant Green Bile Broth
- **MLBB-** MacConkey Lactose Bile Broth



(MPN confirmative BGBB medium)



(MPN confirmative Positive Test at second day)

- **Reporting:-**

Class	Grade	Coliform count/100 ml	*E.coli*/100 ml
1	Excellent	0	0
2	Satisfactory	1-3	0
3	Suspicious	4-10	0
4	Unsatisfactory	>10	>0

- **Testing:-**

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Temp.	Test	Reading	Result	Organism
37°c	Indole-BGBB	48 hrs.	Gas+indole	Coliforms
44°c	Indole-BGBB	24 hrs.		Fecal *E.coli*

6) 10-11th June…

➢ **Sample:-** Urine (**Appearance:-** Clear)

- **Gram Staining:-** Gm-ve
- **In microscope:-** No pus cells observed.
-

Culture plate	Colony characteristics
1.CLED plate	No growth

- **Result:-** No pathogenic organism found.

➢ **Sample:-** Pus

- **Gram Staining:-** No organism and no pus cells observed.
- **AFB Staining:-** AFB negative
-

Culture plate	Colony characteristics
1. N agar plate	No growth
2. MacConkey's plate	No growth
3. Blood agar plate	No growth

- **Result:-** No growth observed on NA/MAC/BA plates.
- **Conclusion:-** No pathogenic organism found.

7) 12th June…

➢ **Sample:-** Sputum

- **Gram Staining:-** Moderate number of GPC (Gm+ve Cocci) and GNB (Gm-ve Bacilli) bacteria observed.
- **AFB Staining:-** AFB Negative
- **In microscope:-** Moderate numbers of pus cells in pairs and epithelial cells observed.
-

Culture plate	Colony characteristics

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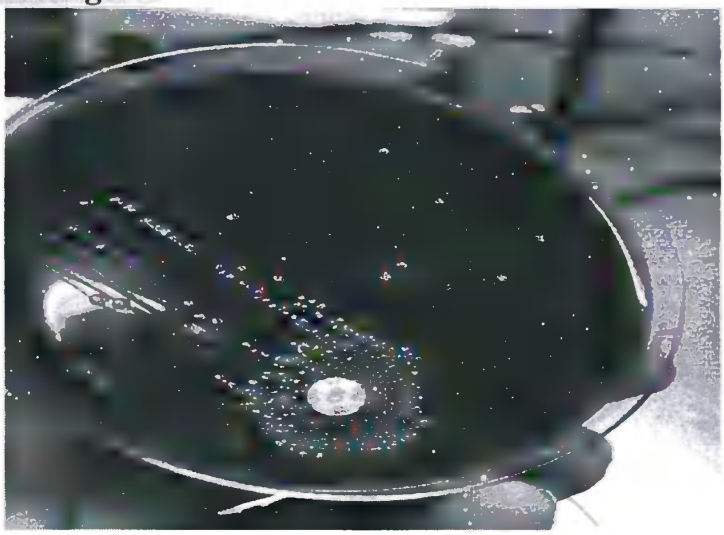
1.Blood agar	Two types of colonies… Big , round, mucoid and small ,round colonies
2.Chocolate agar	No growth
3. Macconkey's agar	Big , round, convex, mucoid colonies

- **Macconkey's plate:-**

- **Blood agar:-**



- **Gram staining from MacConkey agar plate:-** Gm-ve Rods found
- **Biochemical tests:-**

Test	Result

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Citrate	Positive
TSI	A+/A+G+
Sugar 1%	Suc/Dex/Mal/Lac..A+G+
Oxidase	Negative
MR-VP	MR-positive
PPA	Negative
Urease	Positive
Indole	Negative

(Vp positive) (Sucrose positive) (Urease Positive)

(Citrate Negative) (PPA Negative)

- **Conclusion:-**From the above test results it can be concluded that the found organism is " ***Klebsiella pneumoniae*".**

➢ **Sample:-** Plural Fluid

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- **Gram Staining:-** No organism and pus cells observed.
- **AFB Staining:-** AFB positive

- **Culturing:-**
  Day 1- Smear+ sc to NA/MAC/BA/CA
  Day 2- No growth
  Day 3- Smear+ sc to NA/MAC/BA/CA
  Day 4- No growth

- **Result:-** No pathogenic organism seen

➢ **Quality control for water analysis:-**

- **Gram Staining:-** GPC (Gm+ve Cocci) bacteria observed
- **AFB Staining:-** AFB positive
- **Result:-**

	Asodar
	MPN/100 ml
Coliform conf. at 37°c (BGBB)	01/100 ml
Gas pro. At 44°c	00/100 ml
Indole at 44°c	Negative

- **Conclusion:-** Result of the sample is Negative. So, the water is Satisfactory to drink.

8) 13th June…

➢ **Quality control for water analysis:-**

- **Gram Staining:-** GPC (Gm+ve Cocci) bacteria observed
- **AFB Staining:-** AFB positive
- **Result:-**

	Chikhodra
	MPN/100 ml
Coliform conf. at 37°c (BGBB)	<1/100 ml
Gas pro. At 44°c	<1/100 ml
Indole at 44°c	<1/100 ml

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- **Conclusion:-** Result of the sample is Negative. So, the water is Excellent to drink.

9) 14th June...

➢ **Sample:-** Urine

- **Gram Staining:-** GPC (Gm-ve Cocci) observed.
- **AFB Staining:-** AFB negative
-

• Culture plate	• Colony characteristics
• 1.CLED plate	• No growth

- **Result:-** No organism found.

10) 15th June...

➢ **ELISA test:- (Enzyme Linked Immuno sorbent Assay):-**

Procedure:-

- Add 50 micro litre Diluent, 50 micro litre Controls, ~~Calibrator and Sample in~~ the each well. Specify properly
- Prepare working reagent.
- Add 100 micro litre Conjugate.
- Cover the plate and incubate for 90 minutes and at 37°c.
- Wash it 6 times.
- Prepare chromogenic substrate. µl
- Add freshly prepared substrate 150 micro litre in it.
- Incubate the solution for 30 minutes at room temperature.
- Then add stop solution 100 micro litre.
- Now read the results.

➢ **Well plate:-**

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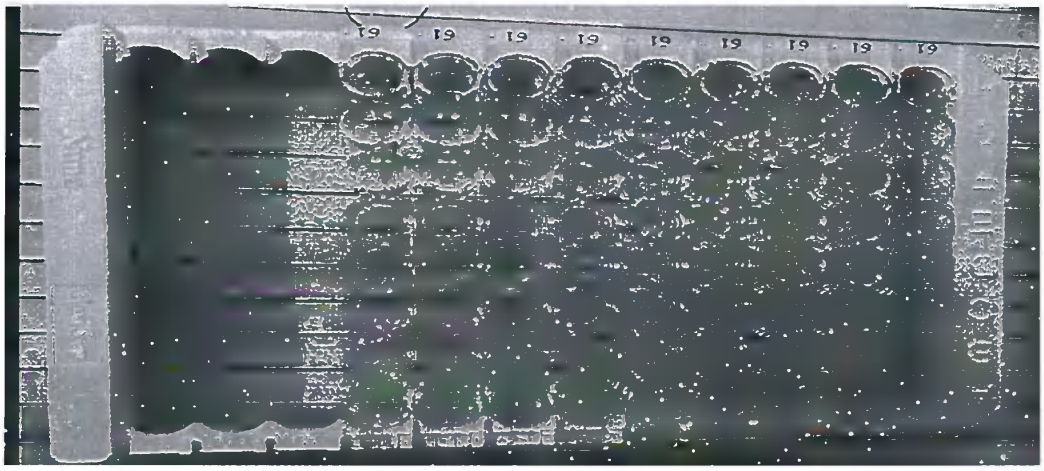
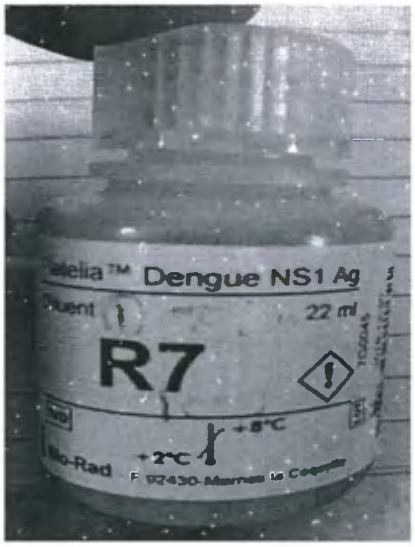
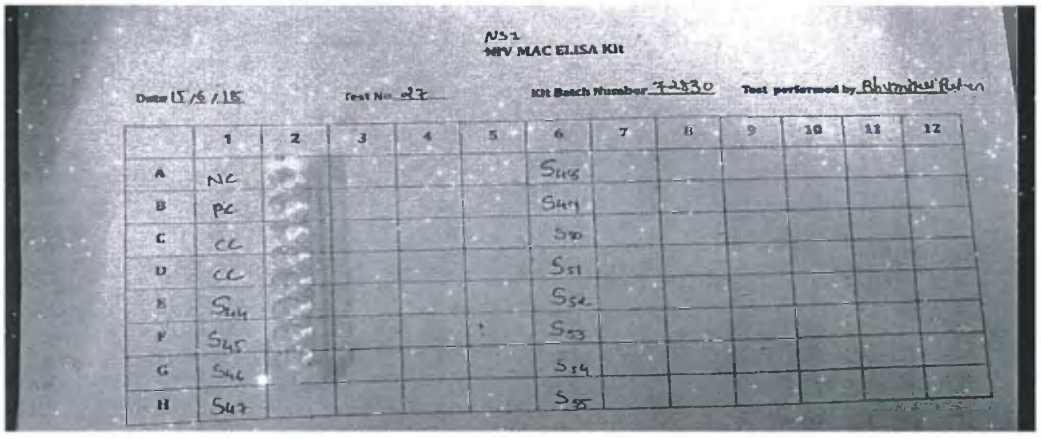


Diluent:-



Controls:-

Ns1 MAC ELISA Kit:-



NS1
MIV MAC ELISA Kit

Date 15/5/15 Test No. 27 Kit Batch Number 72330 Test performed by Bhumika Patel

	1	2	3	4	5	6	7	8	9	10	11	12
A	NC					S48						
B	PC					S49						
C	CC					S50						
D	CC					S51						
E	S44					S52						
F	S45					S53						
G	S46					S54						
H	S47					S55						

-
-
- **Some other observations…**

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- Indole test positive for fecal E.coli

Shigella colony from Stool Sample on MacConkey plate

- *Enterococcus* on chocolate agar:-

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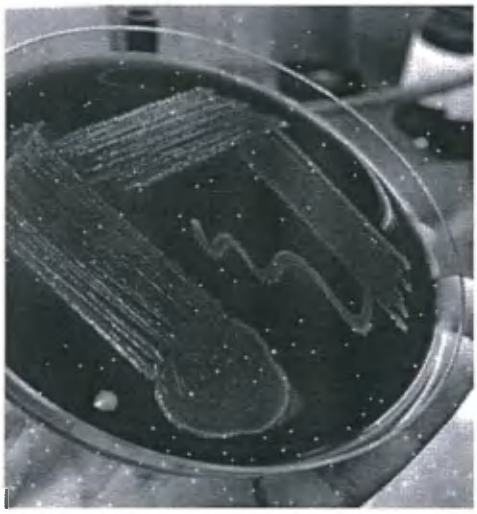
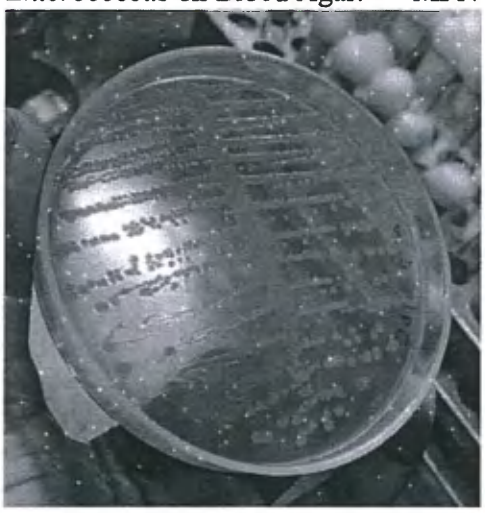


- *Enterococcus* on Blood Agar:- MPN Positive:-



- Nail Fungal on SDA agar:- Contaminated Fungi:-
  (Sabouraud Dextrose Agar)

- Steam Chemical Integrator for Sterility Checking:-

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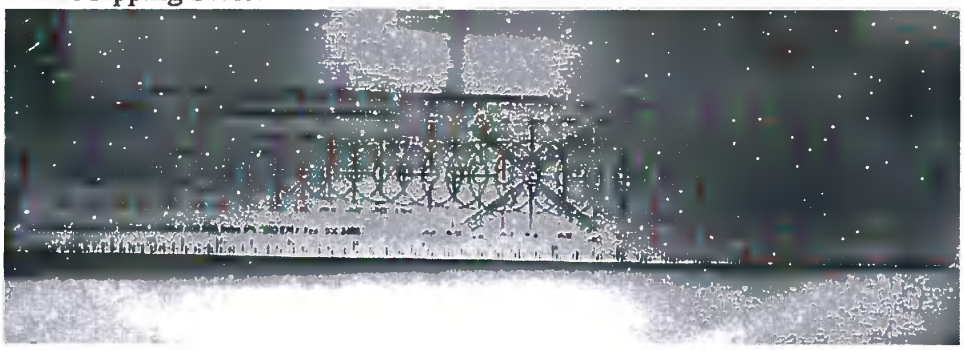
Complete Sterilization

Incomplete Sterilization

- Zone Mapping Scale:-



- Chocolate agar plate CLED agar plate

- Blood agar and Mac Conkey's agar plate:-

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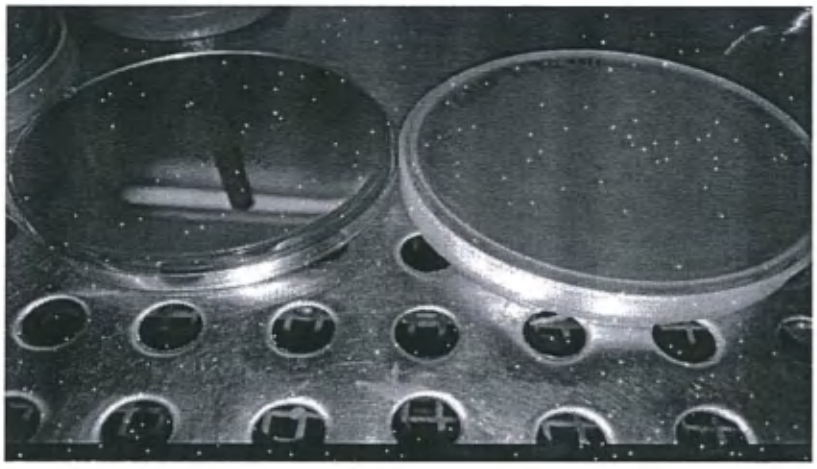

- **Work we have done in the lab...**

- **Preparation of agar:- (Muller Hinton Agar)**

1-To make Muller Hinton Agar Medium take 500 ml Distilled Water in the Conical Flask.

2-Then add 0.6 gram Agar Powder these into that.

3- After that dissolve it.

4- Then secure the mouth of the Conical Flask with the Cotton wool and put it in the Autoclaving for 15 minutes.

- **Preparation of Sugar Broth:-**

To prepare 0.1% Sugar Media..

Why do we prepare 0.1% sugar media?

1-Take 100 ml Distilled Water.

2-And add 2.1 gram agar powder into that.

Sugar Powder	Volume
1-Phenol red Maltose	2.1 gram
2-Phenol red Dextrose	2.1 gram
3-Phenol red Sucrose	2.1 gram
4-Phenol red lactose	2.1 gram
5-Phenol red Mannitol	2.1 gram

3- Now, dissolve it and autoclave .

4- Then let them to cool down and then pour in the Petri Plates.

(15-20 ml in each plate).

- **Peptone Water Preparation:-**

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- **How to make it?**

  1- Take 100 ml Distilled Water
  2- Add 1 gram Peptone type 1.
  3- Then add 0.5 grams NaCl.
  4- Boil and autoclave it.
  (If agar powder is used in the preparation of media, it is necessary to be boiled and then autoclaving it. And if the agar powder is not used, there is no need to boil before autoclaving.)

➢ Staining Methods:-

1- Gram Staining
2- Acid Fast Staining

➢ Media Preparations for MPN Method:-

- Prepare medium (either mac Conkey broth or Lactose broth) in single and double standard concentration.

  For untreated or polluted water :
  - Dispense the double std. medium in 10 tubes (10ml in each tube) and single std. medium in 5 tubes (10 ml in each tube) and add an durham tube in inverted position.

  For treated water:
  - Dispense the double std. medium in 5 tubes (10ml in each tube) and 50 ml single std. medium in 1 bottle and add a durham tube in inverted position.
- Examine the tubes to make sure that the inner vial is full of liquid with no air bubbles. And autoclave it.

➢ Biochemical Tests:-

Inoculation of colony	**Streaking of Colony**
1- Indole broth	1-Urease slant
2-M-R broth	2-TSI slant
3-Vogus-Proskaur broth	3-PPA slant
4-Urea broth	4-Citrate slant
5-Lactose sugar broth	
6-Maltose sugar broth	
7-Mannitol sugar broth	
8-Sucrose sugar broth	
9-Dextrose sugar broth	

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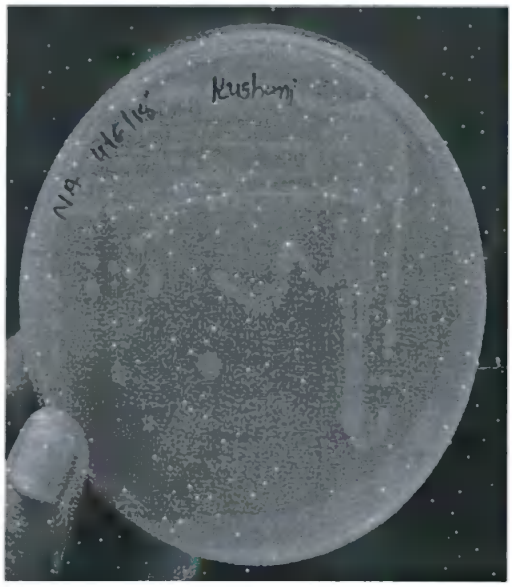
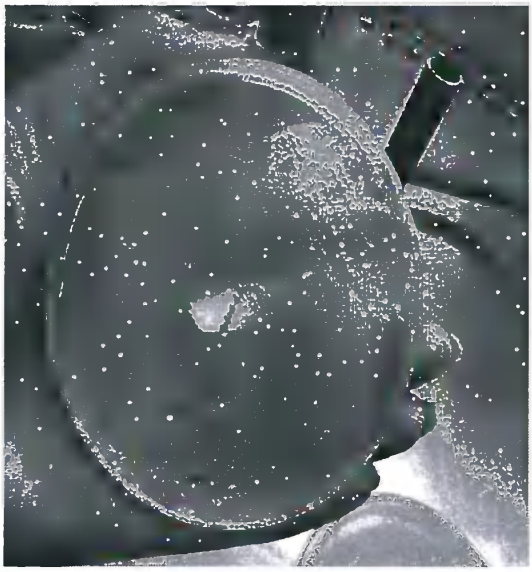
➢ **Streaking Plates:-**

1) Nutrient agar plates(*Staphylococcus aureus*) :-





Result- Large, Circular, Convex, Mucoid, Golden-yellow pigmented colonies of *S.aureus* observed on N-Agar.

2.

Result:- Contaminated colonies of *S.aureus* are seen in these both Plates.

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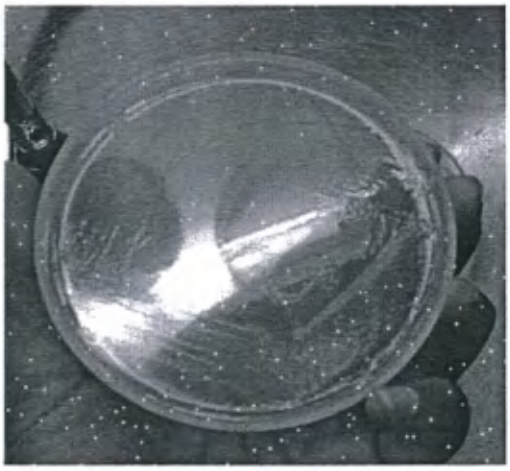
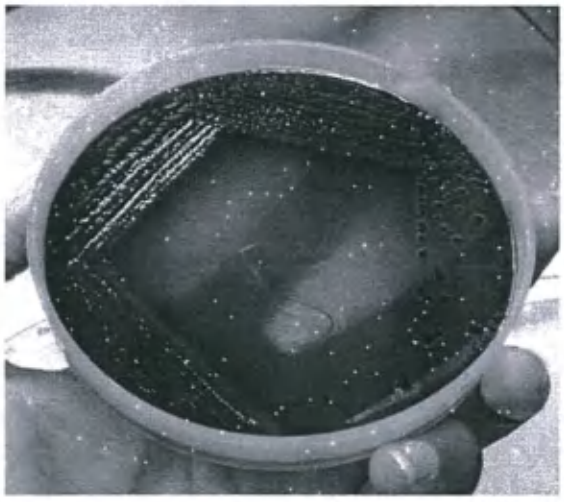
- **Nutrient Agar Plate:-** ***(Proteus mirabilis*):-**



Result:- Swarming Growth of *P.mirabilis* is observed on the N-agar Plate.

- **Blood Agar Plate:-** ***(Proteus mirabilis*):-**



Swarming growth not seen? And why do the colonies appeared black in color?

Result:- Small, Mucoid, Irregular, Convex and Black colored colonies of *P. mirabilis* are seen on the Blood Agar.

THE END…

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TRAINING REPORT

PATEL NENSY RAJESHKUMAR

17MSMLT005

(CIPS)

CHARUSAT UNIVERSITY

Guided by: Dr. Amar Pandya, Microbiologist, S.S. Hospital, Petlad

Co-guided by: Dr. Artee Tyagi, Assistant Professor, CIPS, CHARUSAT

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Host Institution: S.S. (SHREE SAYAJI) HOSPITAL, PETLAD.

Period: 4TH-17TH of June, 2018

Aim: To learn "Medical Microbiology Laboratory Techniques"

About hospital:

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S.S. hospital is headed by government as this hospital is district level multispecialty CIVIL hospital.

Establish in 1970s.

As it is CIVIL hospital it has a great useful for the patient's cannot afford the expense of private hospital.

PERSONAL LEVEL:

Microbiologist and pathologist

(DR.AMAR PANDYA & DR.MENGAR)

Senior technicians

(Miss.Bhoomika Patel)

Other technicians

(Mrs.Nupor Patel)

Other staff

(Mr.Bharat rathod)

Service profile:

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SR NO	TEST	REASON FOR TEST
1	VDRL/RPR test	Syphilis
2	HIV test	HIV-AIDS
3	Sputum for AFB	TB
4	IgM antibody	Dengue
5	Ns 1 antigen (ELISA)	Dengue
6	RA	Joint pain, joint redness, joint stiffness, joint tenderness
7	ASLO	Strep infection cause b ? gas bacteria
8	HBsAg (rapid test)	HBV(liver function)
9	Serum CRP	Infection marker
10	Hepatitis –A ELISA IgM antibody	Viral hepatitis
11	Hepatitis –E ELISA IgM antibody	Viral hepatitis
12	Cholera culture (antibiotic sensitivity)	Cholera
13	Blood culture(antibiotic sensitivity)	Blood infection
14	Diphtheria culture(antibiotic sensitivity)	Diphtheria
15	Measles ELISA IgM antibody	Measles
16	Chikungunya-ELISA IgM antibody	Chikungunya
17	HCV antibody	Hepatitis C virus infection
18	Leptospirosis(rapid antibody)	Leptospira infection
19	UPT(urine pregnancy test)	Pregnancy
20	Urine culture and antibody sensitivity)	Urine infection
21	Stool for ova and cyst	Parasite infection
22	Widal slide test	Typhoid

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INSTRUMENTS USED IN LABORATORY:

1. **LAMINAR AIR FLOW:** A laminar flow cabinet is a carefully enclosed bench designed to prevent contamination of semiconductor wafers, biological samples, or any particle sensitive materials. Air is drawn through a HEPA filter and blown in a very smooth, laminar flow towards the user. Due to the direction of air flow, the sample is protected from the user but the user is not protected from the sample.

2. **INCUBATOR:** An incubator is a device used to grow and maintain microbiological cultures or cell cultures. The incubator maintains optimal temperature, humidity and other conditions such as the carbon dioxide (CO_2) and oxygen content of the atmosphere inside.

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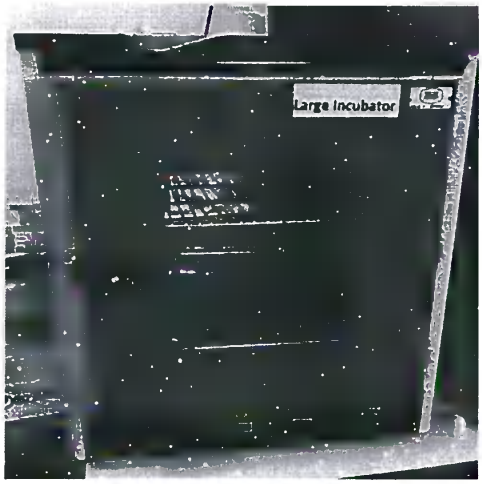
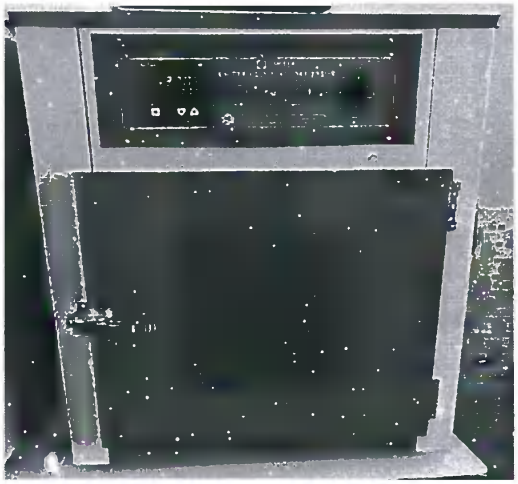
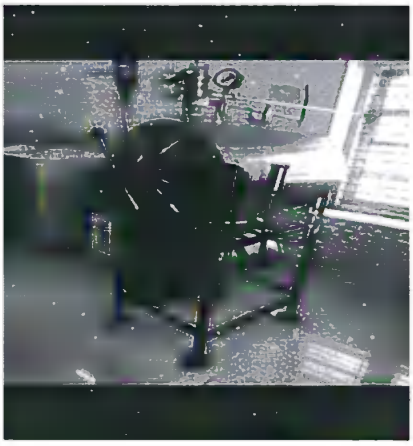




3. REFRIGERATOR:

4. AUTOCLAVE:



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Vertical autoclave Horizontal autoclave

5. MICROSCOPE:

SPECIMEN COLLECTION:

1. **Blood**

2. **Urine**

3. **Stool**

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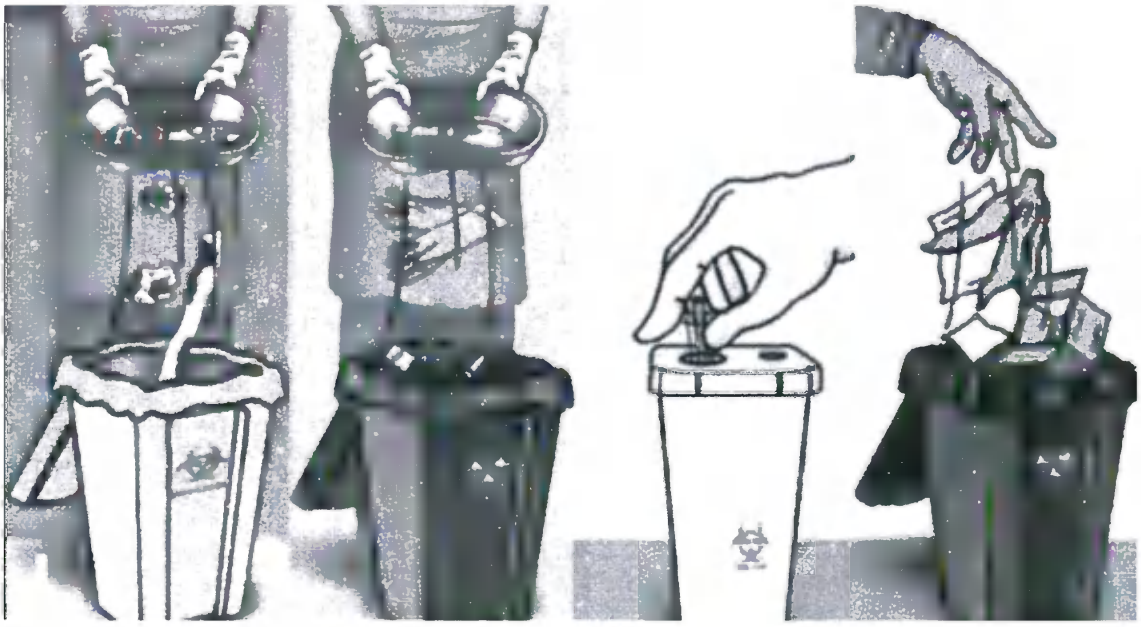
4. **Sputum**

5. **Body fluid**

WASTE DISPOSAL:



SOP FOR INOCULATION OF SPECIMEN ON CULTURE:

1. **Gram's staining:**

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- Make a smear, dry in air
- The smear is fix by passing the slide over flame 2-3 times quickly
- Cover the slide with crystal violet solution and allow to act for about 1 minute
- Pour off stain under running water and cover the slide with fresh iodine solution and to act for 2 minutes
- Pour off stain under running water and decolorize with 100% acetone. Decolonization is very rapid and is usually complete in 2-3 seconds. After this period of contact, wash thoroughly with water under a running tap
- Apply the counter stain 0.5% Safranine for 30 second
- Wash with water and blot dry and examine under oil immersion lens.

2. Acid Fast bacilli Staining:

- Make a smear, air dry and heat fix. (for sputum take from yellow purulent portion of the sputum)
- Place the fixed slide on the staining rack with the smeared side facing upwards
- Pour filtered 1% carbol fuchsine over the slide so as to cover the entire slide
- Heat the slide underneath until vapors start rising. Do not let carbol fuchsine to boil or the slide to dry. Continue the process up to five minutes.
- Allow the slide to cool for 5-7 minutes.

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- Gently rinse the slide with tap water to remove the excess carbol fuchsine stain.
- Decolorize the stained slide by pouring 25% sulphuric acid on the slide and leaving the acid for 2-4 minutes. Repeat decolorizes process 3-4 times until pink color subsides form smear.
- Counter stain the slide by pouring 0.1% methylene blue solution on to slide and let it stand for one min
- Gently rinse the slide with the tap water and tip the slide to drain off the water, dry it and see under oil immersion lense.

3. AFB staining method for the weakly acid fast organisms:

- For lepra bacilli AFB staining done in the same way as the tubercle bacillus, except that 5% sulphuric acid is used for decolourization in the place of 25% sulphuric acid
- For Nocardia AFB staining done in the same way as the tubercle bacillus, except that 0.5% sulphuric acid is used for decolourization in the place of 25% sulphuric acid.

INOCULATION OF SPECIMEN ON CULTURE MEDIA:

Blood and body fluids	**Sheep blood agar Chocolate agar(optochin disc in well if gram positive cocci**

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	seen in smear) MacConkey agar Nutrient agar
Urine	Two CLED (one for colony count and one for colony seperation) Nutrient agar
Pus/vaginal swab/cervical swab/wound swab/throat swab/conjuctival swab/corneal swab	Sheep blood agar MacConkey agar Nutrient agar
Sputum/bronchoalveolar lavage/endotracheal and tracheostomy aspirate	Sheep blood agar Chocolate agar(optochin disc in well) MacConkey agar
Stool	XLD Nutrient agar MacConkey agar Sorbitol MacConkey agar(if bloody stool) TCBS (if stool specimen suspect for cholarae and loopful specimen in to APW & after 6 hours of incubation subculture on above media except XLD)

Work done:

Peptone water preparation:

- 100ml of distilled water + 1gm of peptone type 1 + 0.5gm of NaCl. Boil it and then autoclave it. After autoclave adjust pH 6-7.

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- Use this peptone water for preservation of the bacteria.
    - Take 850ul of peptone water + 1 loopful of bacteria. Incubate it for 24 hours for growth and add glycerol to preserve it for long period of time.

Nutrient agar (for 500ml):

- 14 gm NA agar powder + 0.6 gm agar powder

MacConkey broth purple (100 ml):

- Single standard for 5ml test tube – 4 gm MCBP
- Double standard for 10 ml test tube and 50 ml bottle – 16 gm MCBP

Muller Hinton's agar (for 500ml):

- 19 gm Muller Hinton's agar powder + 0.6 gm agar powder

Sugars:

Sugar %

- Phenol red maltose broth – 2.1 gm in 100 ml
- Phenol red dextrose broth – 2.1 gm in 100 ml
- Phenol red sucrose broth – 2.1 gm in 100 ml
- Phenol red lactose broth – 2.1 gm in 100 ml

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- Phenol red manitol broth – 2.1 gm in 100 ml

Work and work observe:

4th June 2018: Observed

Sample: Sputum

Gram stain – gram positive cocci

ZN stain – AFB stain

Next day

Colony observation on: MacConkey agar, Blood agar, Chocolate agar (no optochin resistance found)

- Smear from MacConkey agar seen gram positive cocci
  Result: no pathogen isolated after 24 hours of Incubation.

5th June 2018: Work done

Sample: pus

Gram stain – moderate number of gram Positive cocci arrange in single, pair with no pus cell seen.

ZN stain – no AFB seen

Work observed:

Next day

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Colony observation on: Nutrient agar, MacConkey agar, Blood agar (shows beta-haemolytic colony).
-smear from nutrient agar nutrient agar plate colony
-biochemical test from nutrient agar plate colony

- **Catalase**: positive
- **Coagulase**: slide test and tube test positive
- **Sugars:** positive

ASO is also performed and interpreted according to the ASO chart.

Result: *Staphylococcus aureus* is isolated after 48 hours of incubation.

Sample: Vaginal swab

Work done:

Gram stain – gram positive bacilli

Work observed:

Colony observation: No growth observed on

NA, MAC, BA.

Result: no pathogen is isolated after 48 hours of incubation.

Sample: QC

Work observed:

Gram stain – gram positive cocci

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ZN stain – AFB seen.

6th June 2018: work observed

Sample: QC

Gram stain – gram positive cocci

ZN stain – AFB seen

7th June 2018: work observed

Sample: QC

Gram stain – gram positive bacilli

ZN stain – AFB seen

8th June 2018: **Sample**: QC

Gram stain – gram positive bacilli

ZN stain – AFB seen

Sample: Urine

Gram stain – no organism with no pus cells

CLED agar – negative after 48 hours of Incubation

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Sample: Blood

Gram stain – no organism found

Till 5th day of incubation no pathogen was found.

9th June 2018: Work done

Sample: QC

Gram stain – gram positive cocci

ZN stain – AFB seen

Sample: Urine

Gram stain – moderate number of gram positive cocci in single with gram positive Bacilli seen with few pus cells.

CLED – colony observe and prepare smear Shows gram positive bacilli And motility shows motile bacteria.

Biochemicals tests:

- **Citrate**: negative
- **TSI slant**: A positive/ AG positive
- **Sugars**: AG positive
- **Indole**: positive

Result: *E.coli* is isolated after 48 hours of

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Incubation

11th June 2018: Work observed and done

Sample: pus
Gram stain – no organism with no pus cells
ZN stain – no AFB seen

Sample: Urine

Gram stain – no organism with no pus cells

CLED agar shows no growth after 48 hours of Incubation

Sample: QC

Gram stain – gram positive cocci seen

ZN stain – AFB seen

12th June 2018: Work done and observed

Sample: sputum

Gram stain – gram positive cocci in pair + Gram negative bacteria with pus cells and epithelial cells.

Ratio of pus and epithelial cells

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ZN stain – AFB seen

BA, CA, MAC streaked.

Smear from MAC gram negative none motile bacteria.

Biochemicals tests:

- **Citrate**: positie
- **TSI slant**: A positive/ AG positive
- **Sugars**: AG positive
- **Oxidase**: negative
- **MR-VP**: MR positive, VP positive
- **PPA**: positive ?
- **Urease**: positive
- **Indole**: negative

Result: *Klebsiella pneumonia* is isolated after 48 hours of incubation.

Sample: plural fluid

Gram stain – no organism no pus

ZN stain – AFB not seen.

13th June 2018: Work observed

Sample: QC

Gram stain – gram positive cocci

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ZN stain – AFB seen

14th June 2018: Work observed

Sample: QC

Gram stain – gram positive cocci

ZN stain – AFB seen

4th – 11th June 2018: Work observed

WATER CULTURE (MPN METHOD)

4th June 2018:

4 SAMPLES:

Write sample number

- Unsatisfactory for drinking
- Excellent for drinking
- Unsatisfactory for drinking
- Satisfactory for drinking

7th June 2018:

2 SAMPLES:

Write sample number

- Unsatisfactory
- Satisfactory

11th June 2018:

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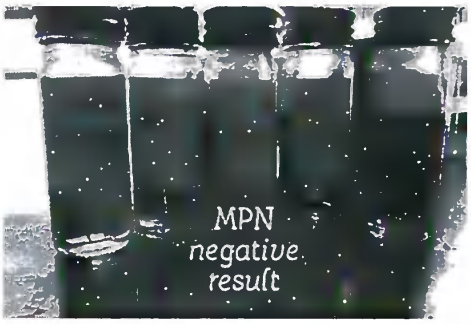
- Satisfactory

Work observed:

MPN test:



Has formation +ve in bgbb 2nd day procedure for MPN method for water analysis

Indole test:

Indole test positive for fecal ecoli

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Coagulase test:

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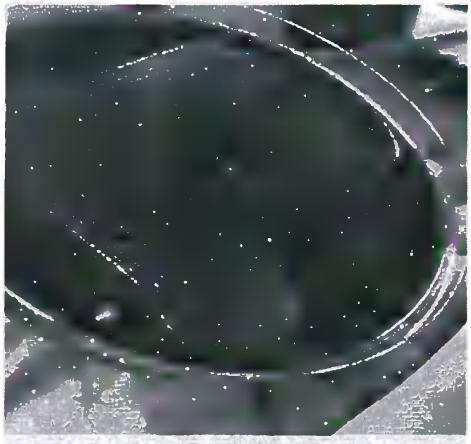
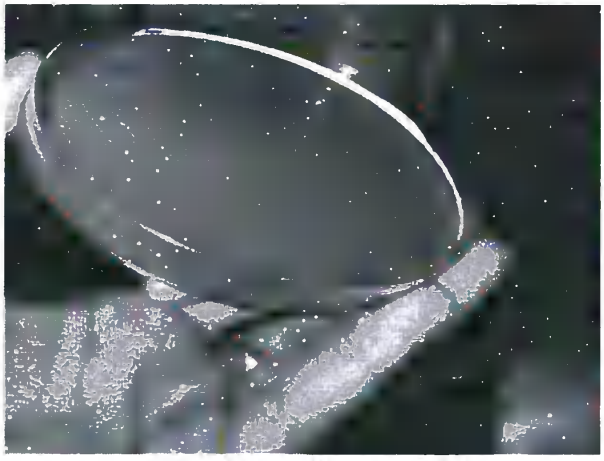
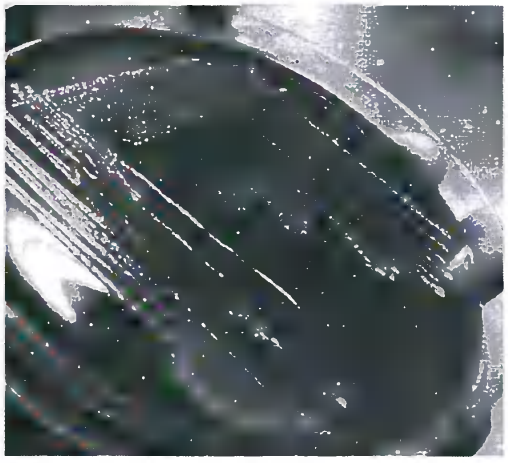
Streaking plate:



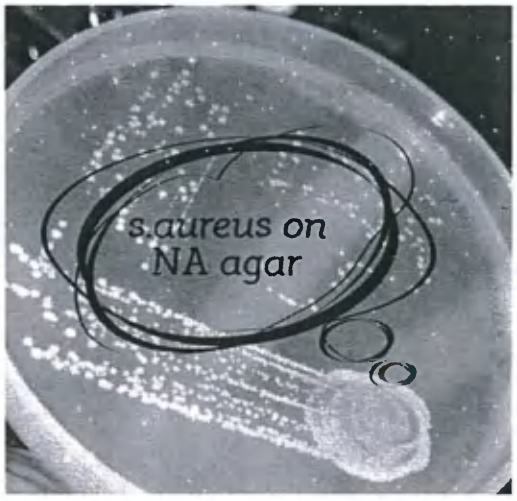
Enterococcus on blood agar



Enterococcus on chocolate agar



Enterococcus on chocolate agar



Blood agar s.aureos

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Klebsela on Mac ATCC

D test: D test is performed by spreading the test organism on Muller Hinton agar (MHA) for Staphylococci and MHA with 5% Sheep blood (for Group B Streptococci) and placing a 15ug Erythromycin disk near to a 2ug Clindamycin disk. After overnight incubation, a flattering of zone of incubation around the Clindamycin disk near the Erythromycin disk (producing a zone of inhibition shaped like the alphabet D) is considered a positive result and indicates that the Erythromycin has induced Clindamycin resistance (a positive "D-zone test"). This test can help us to determine whether Clindamycin should be reported as susceptible (when D test is negative) or as resistant (when D test is positive) in erythromycin resistant strains.

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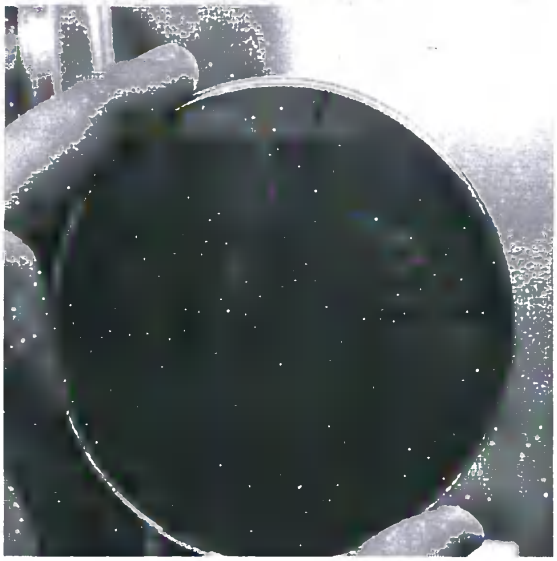
Work done:

B hemolysis blood agar s. Aureos



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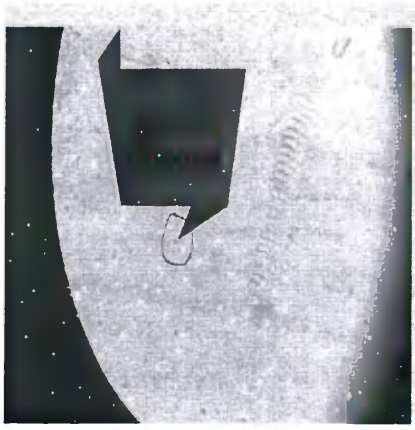
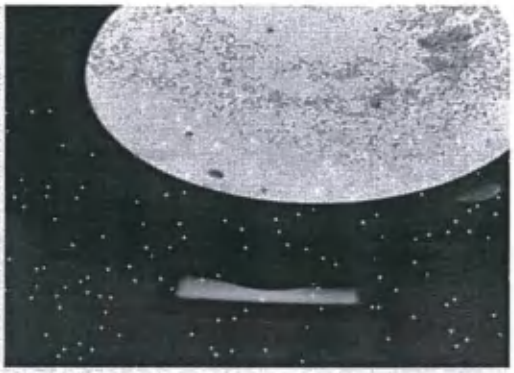
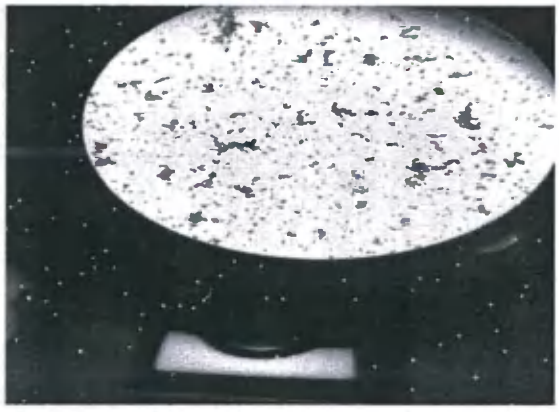
Gram staining:





Gram negative rods klebsela from sputum



Gram positive cocci in chain single and bunch from blood sample

Biochemical tests:

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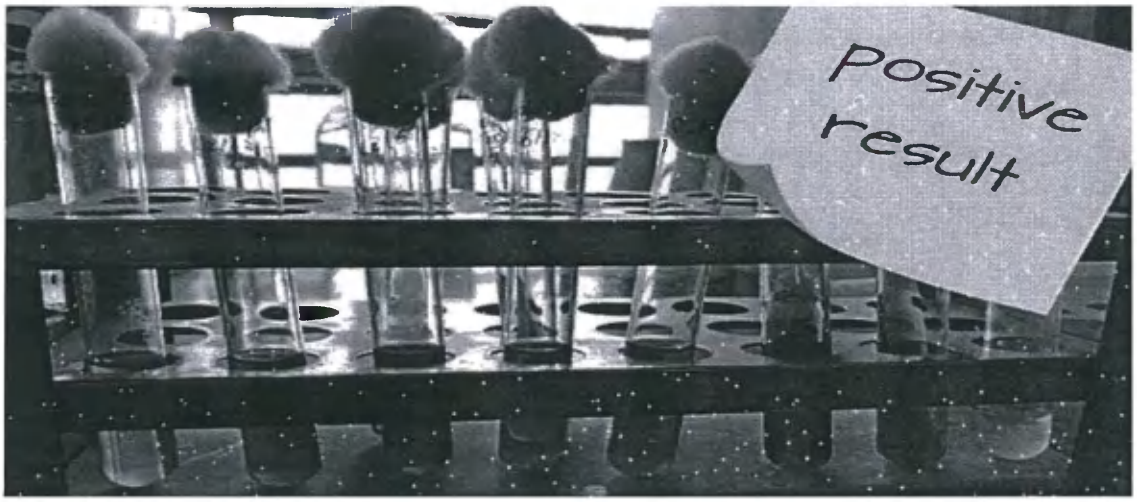

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Summer Training Report 2018

Duration: 4th June 2018 to 15th June 2018

Done at

S.S. HOSPITAL, PETLAD

M[illegible]OJA KETAN[illegible]AR[illegible]NDHI

1st [illegible]

[illegible]ICAL [illegible]

अमृतं तु विद्या

CHARUSAT

Under the guidance of

[illegible]R. A[illegible]AR P[illegible]NDYA

MICROBIOLOGIST

S S HOSPITAL, PETLAD

Under the co-guidance of

Dr. ARTEE TYAGI

Assistant professor

CHAROTAR INSTITUTE OF PARAMEDICAL SCIENCE

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CIPS
CHAROTAR INSTITUTE OF PARAMEDICAL SCIENCES

Charotar Institute of Paramedical Sciences

Charotar University of Science and Technology

DECLAR

I, the undersigned Pooj umar the otar institute of paramedical sciences a te Charotar U o nd technology, Anand, hereby sincerely declar at teen mi .HOSPITAL, PETLAD is based on my own learning work and has not been previously submitted to reason. This work is purely carried out to my own understanding and my sincere efforts.

अमृतं तु विद्या

CHARUSAT

Place: - Petlad

Date: -

Pooja Jetankumar Gandhi.

First year Msc.

Medical laboratory technology

Certified By:

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ACKNOWLEGMENT

It is universal truth that each & every Endeavour is the culmination of the efforts put by more than one individual. This is obvious not the exception. Truly speaking rather for writing this project, thought it was a tedious work, but it has been done with the movements of joy and interwoven in it. Naturally many people have stood by me to see my project on completion.

My sincere, "THANKS" goes to my teachers guide DR.DHARSAN PATEL,DR. DHARA PATEL,DR.ARTEE TYAGI,MR.DEBAYAN BAIDYA whose timely help and genuine interest in my work and consideration kept me going through the rough patches, I encountered during my work.

Also I express my profound gratitude to DR.AMAR PANDYA (HEAD MICROBIOLOGIST) for allowing me to do the training in the microbiology department, project report at S.S.HOSPITAL.

I do precise my appreciation towards the sta[illegible]OSPITAL namely MISS.BHOOMIKA PATEL and MR.BHARAT THAKOR.

It is pretty difficult for m[illegible]ress my gratitude to [illegible]ers who have provide me the useful yet impor[illegible]mati[illegible]ata[illegible]ing[illegible]bject with their cent percent participation, coo[illegible]n and with [illegible]ou[illegible]e to do the project.

I also appreciate the help of other technicians and assistants who have given me insightful suggestions, comments and tips during my training period.

I am extremely thankful to my friends, who have contributed and assisted me in my work. I am thankful to the staffs of CPS and people who have given the necessary information whenever required.

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OBJECTIVES

THE FOLLOWING ARE THE MAIN OBJECTIVES OF THE TRAINNING.

- To know about the practical aspects of the laboratory in more details.
- To know more about laboratory management, its organization, its layout, its financial aspects, etc.
- To get experience in various aspects like patient's interaction. Interaction between other technicians, laboratories& hospitals, case study etc.
- To know about automated, semi automated instruments & test like ELISA etc.
- Overall the main objective is to be aware of all the basic aspects of laboratory training.

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LIMITATIONS

EVERY LABORATORY HAS CERTAIN LIMITATIONS FOLLOWING ARE SOME LIMITATIONS WHICH WAS FACED DURING THE TRAINING.

- First of all in the haematology department test like CBC were done by fully automated machine while in biochemistry test were done by semi automated machines which limited the practical knowledge by manual method.
- As I am not aware of microbiology practical I have take the training only in microbiology department.
- The microbiology department also has some limitations as the samples are blood, urine, stool, sputum and other body fluids we were restricted to do hands on practice.

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CHAPTER 1

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INTRODUCTION OF LABORATORY

HISTORY:

SHREE SAYAJI HOSPITAL is headed by a government as this hospital is district level multispecialty CIVIL hospital. It was established in 1970s.

As it is civil hospital it has a great useful for the patients who can't afford the expense of private hospitals.

PROFILE:

The hospital is situated in the main area of petlad.

Its exact location is;

S.S.HOSPITAL

Near railway station, petl[illegible]-3860[illegible]

[illegible]

The following tests are pe[illegible]ne[illegible]epartm[illegible]

Sr.NO.	Test	
1	VDRL/RPR test	
2	HIV test	
3	Sputum for AFB	
4	IgM antibody	Dengue
5	Ns1 antigen (ELISA)	Dengue
6	RA	Joint pain, joint redness, joint stiffness, joint tenderness
7	ASLO	Strep infection cause by GAS bacteria
8	HBsAg(Rapid test)	HBV(liver infection)
9	Serum CRP	Infection
10	Hepatitis –A ELISA IgM antibody	Viral hepatitis
11	Hepatitis-E ELISA IgM antibody	Viral hepatitis
12	Cholera culture (antibiotic sensitivity)	Cholera
13	Blood culture (antibiotic sensitivity)	Blood infection
14	Diphtheria culture (antibiotic sensitivity)	Diphtheria
15	Measles ELISA IgM antibody	Measles
16	Chikungunya- ELISA IgM antibody	Chikungunya
17	HCV antibody	Hepatitis C
18	Leptospirosis(Rapid antibody)	Leptospirosis
19	Urine pregnancy test (UPT)	Pregnancy
20	Urine culture and antibody sensitivity	Urine infection
21	Stool for ova and cyst	Parasite infection
22	WIDAL slide test	Typhoid

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✦ LABORATORY LAYOUT:

ORGANIZATION LEVEL:

Firstly, patient is referred by doctor

⇩

Go for slip & money

⇩

Collection of various specimens

⇩

r system)

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Investigatio n

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PERSONAL LEVEL:

Microbiologist & Pathologist
(DR.AMAR PANDYA & DR.MENGAR)

⇩

Senior technicians
(Miss.Bhoomika Patel)

⇩

⇩

Other

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SPECIMEN COLLECTION:

1) BLOOD SPECIMEN:

The blood collection is done by a phlebotomist either by venipuncture technique or capillary technique but most venipuncture technique is used. Sterile needle and tubes are used. Before collection labelling is done on the tube by numbering methods and selection of vein or artery is done and cotton swab soaked in spirit is used.

Vacutainer co Used for what purpose? e is attached to colored tube known as vacutainer.

There are certain vacutainer used in this microbiology department.

2) URINE COLLECTION:

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Mid stream urine collection is preferable for the collection. Use of some anticoagulants is done for the storage of urine for later analysis. For collection wide mouth sterile container is used according to the volume needed. Before collection labelling of container is very much necessary.

In microbiology department anticoagulant is not used because the culturing done of the fresh urine sample.

3) STOOL COLLECTION:

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Wide mouth sterile container is used for the collection purpose. Label the container before collection.

4) SPUTUM COL

Wide mouth cont sed and labelling ne point to be noted that instruct the patient to giv not sali Make sur bef ample collection patient didn't had a mouth was ng.

5) BODY FLUID COLLECTION:

Body fluid is collected by the doctor its self and sample is transfer to the laboratory with proper labelling such as what is the sample, from where it is taken, time of collection, date ,patients name or ID, name of the doctor who take the sample.

WASTE DISPOSAL:

There are many waste generated in clinical microbiology laboratory. This waste includes used spirit cottons, blood tubes, stool & urine container, sputum container, used vacutainer, used syringe, etc. They need to be disposed properly so that they cannot harm to surrounding environments.

This waste can be called as biomedical waste that can be lead to occupational hazard.

These wastes are disposed in suitable colored bags listed below.

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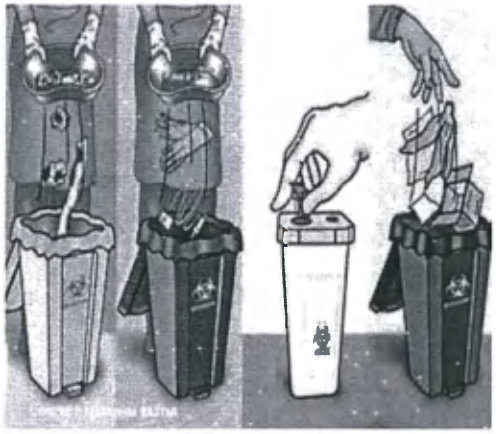

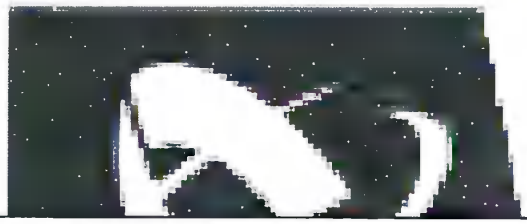

Make a table and enlist in short what kind of waste is disposed in different color coded bags

INSTRUMENTS OF LABORATORY:

MICROBIOLOGY:

In this laboratory blood culture, urine culture,other body fluid culture,sputum culture,stool culture collection are done. Samples are collected in sterile container.

Fror the blood culute collection,wash the collection area with spirit, then collect minimum 5ml of blood and insert in culture tube and mix it properly.after collection samples are transfer to the microbiology laboratory.

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After 7 days,report are given to the patients,if sample is urine , stool, sputum or other body fluids reports are given within 3or 4 days.if any fungal infection is suspected report given within 10 days or after 1 month.

Many instruments are used for different purpose:

Laminar air flow chamber:

[Laminar air flow]

It is a chamber used for aseptic transfer of sterilized materials, as well as for inoculation of microbes. The chamber does not get contaminated with the microbes present in the outside air. Though the door is kept opened during inoculation or transfer of media. An UV lamp [illegible] chamber sterilizes the chamber before operation.

USAGE OF SODIUM HYPOCHLORITE IS CONTRAINDICATED

[illegible] steel platform with provision for gas pipe connection for a Bunsen burner. Before use, the platform is cleaned and disinfected with Lysol or other disinfectant, the Bunsen burner is connected and then the glass door is closed.

The UV light is switched on for 10 minutes to sterilise the environment inside the chamber and then switched off. The glass should not be open when UV light is on because it affects the skin and vision. The blower is switched on and then the glass door is opened.

Now the Bunsen burner is lighted and transfer or inoculation is done aseptically in the chamber. If extremely hazardous microbes are to be handled, inoculation has to be done with wearing hand glows and mask and keeping the front door closed.

MICROSCCOPE:

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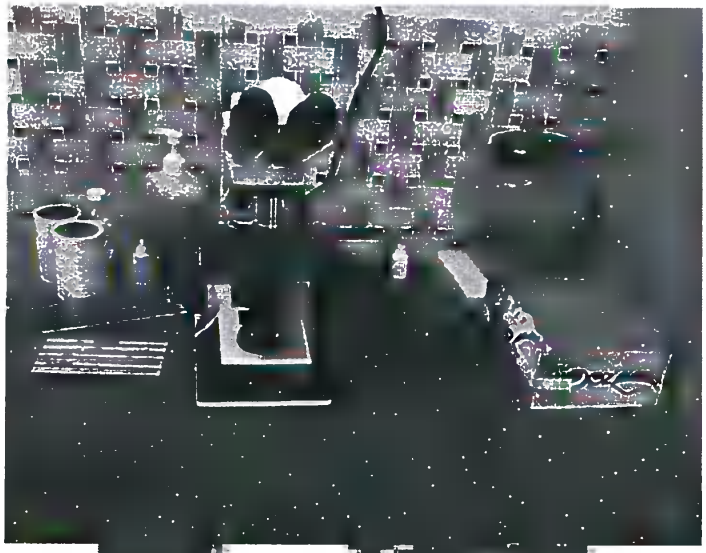

[Microscope]

Different types of [illegible] used for vi[illegible] of morphology, motility, staining, and fluo[illegible] acti[illegible] teria.

DEEP FRIDGE:

It is used to store [illegible] samples at very low subzero temperatures.

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REFRIGERATOR:

[Refrigerator]

It serves as a repository for thermo labile chemicals, solution, antibiotics, serums and biochemical reagents at cooler temperature (2°C).stock cultures of bacteria are also stored

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in it between sub-culturing periods. It is also used for the storage of sterilized media, so as to prevent their dehydration.

MICROBIOLOGICAL INCUBATOR:

Profuse growth of microbes is obtained in the [illegible]ory [illegible]rowing them at suitable temperatures. This is done by [illegible]ting the [illegible] in to a suitable culture medium and then incubating it [illegible] its growth.

As most of the microbes pathogenic to [illegible] profusely at body temperature of normal human being (i.e. 37°C), the usual temperature of incubation is 37°C.
The incubator has a thermostat, which maintains a constant temperature, set according to requirement.

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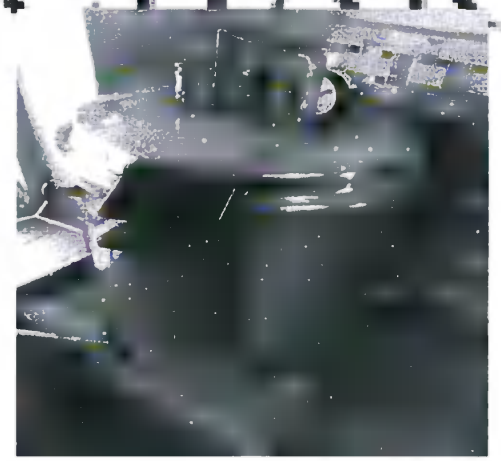
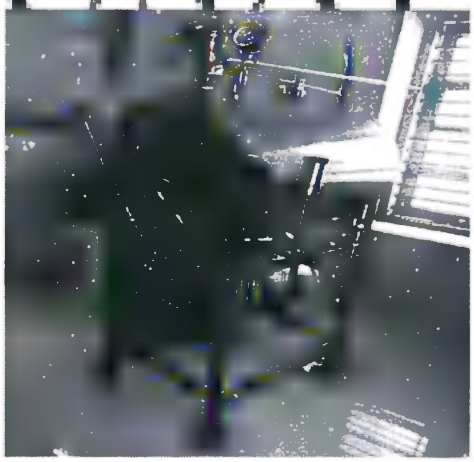
AUTOCLAVE:





Horizontal autoclave **vertical autoclave**

Autoclave is the nucleus of a microbiology laboratory. It is used not only to sterilize liquid substances such as prepared media saline (diluents) solutions, but also to sterilize glassware's, when required.

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It has the same working principle as a domestic pressure cooker. The maximum temperature that can be obtained by boiling water in an open container is 100°C (boiling point of water).

This temperature is sufficient to kill only the non-spore formers, but it is difficult to kill the spore-forming bacteria at this temperature, as they escape by forming heat resistant spores. It takes very long time to kill the spores at this temperature.

On other hand complete sterilization is done at 121°C (a pressure of 15 pounds per square inch i.e.15 psi) for 15 minutes. The required time is considered from the point, when the required temperature-pressure is attained. The pressure and temperature inside goes on increasing .the pressure increase is observed on the pressure dial.

After 15 minute, heating is discontinued and steam release valve slightly opened. If fully opened immediately, due to sudden fall in pressure liquids may out from the containers. The autoclave should never be opened, when there is still pressure inside. The hot sterilize materials are removed by holding them with piece of clean cloth or asbestos coated hand glows.

HOT AIR OVEN:

It is used for sterilization of glassware's, such as test tubes, pipettes and Petri dishes. Such dry sterilization is done only for glassware's. Liquid substances, such as prepared media and saline solutions cannot be sterilized in oven, as they lose water due to evaporation.

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STANDARD OPERATING PROCEDURES OF THE LABORATORY:

Every laboratory has own standard operating procedure (SOP). So, to work with any laboratory first have to know and be aware of the laboratory SOP.

Here during the training we have done gram staining, acid fast staining, and we have made media (all the sugars, Muller Hinton's {MH} agar), streak the plates and inoculate the biochemical media.

There is standard operating procedure for gram's staining and acid fast staining.

SOP FOR GRAM'S STAINING:

- Make a smear, dry in air
- The smea[illegible] by passing the s[illegible] times quickly
- Cover the [illegible] h c[illegible]al violet solu[illegible] all[illegible] act for about 1 minute
- Pour off s[illegible] ru[illegible]ter and [illegible] th[illegible] with fresh iodine solution and act for 2 [illegible]
- Pour off s[illegible] nd [illegible]nning-wa[illegible] d[illegible] 100% acetone. Decolourization is very rapid and [illegible] complete in 2-3 seconds. After this period of contact, wash thoroughly with water under running water.
- Apply the counter stain 0.5%safranine for 30 second
- Wash wit[illegible] rsion lens. [For uret[illegible] tain 0.5% safranine for 5 minutes]

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SOP FOR ACID FAST STAINING:

- Make a smear, air dry heat fix. (For sputum take from yellow purulent portion of the sputum).
- Place the fixed slide on the staining rack with the smeared side facing upwards.
- Pour filtered 1% carbol fuchsine over the slide so as to cover the entire slide.
- Heat the slide underneath until vapours start rising. Do not let carbol fuchsine to boil or the slide to dry continue the process up to five minutes.
- Allow the slide to cool for 5-7 minutes.
- Gently rinse the slide with tap water to remove the excess carbol fuchsine stain.
- Decolorize the stained slide by pouring 25% sulphuric acid on the slide and leaving the acid for 2-4 minutes. Repeat the decolorize process 3-4 times until pink color subsides from smear.
- Counter stain the slide by pouring 0.1% methylene blue solution on to slide and let it stand for 1 minute.
- Gently rinse the slide with the tap water and tip the slide to train off the water. Dry it and see under oil immersion lens.

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AFB STAINING METHOD FOR WEEKLY ACID FAST ORGANISM:

- For lepra bacilli AFB staining done in the same way as the tubercle bacillus, except that 5% sulphuric acid is used for decolourization in the place of 25% sulphuric acid.
- For Nocardia AFB staining done in the same way as the tubercle bacillus, except that 0.5% sulphuric acid is used for decolourization in the place of 25% sulphuric acid.

SOP FOR INOCULATION OF SPECIMEN ON CULTURE:

Specimen	Media used for inoculation
Blood and body fluids	Sheep blood agar Optochine disc in well if Gram positive cocci seen in smear) MacConkey agar Nutrient agar
	CLED agar (one for colony count and one for colony separation) Nutrient agar
Pus/vaginal swab/cervical swab/wound swab/throat swab/conjuctival swab/corneal swab	Sheep blood agar MacConkey agar Nutrient agar
Sputum/bronchoalveolar lavage/endotracheal and tracheostomy aspirate	Sheep blood agar Chocolate agar(optochine disc in well) MacConkey agar
Stool	XLD Nutrient agar Sorbitol MacConkey agar(if bloody stool) TCBS (if stool specimen suspect for Cholera and loopful specimen in to APW & after 6 hrs of incubation Subculture on above media except XLD)

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SOP FOR ANTI-STREPTOLYSIN-O (ASO) TEST:

1. **Name of test:** Anti-streptolysin-O (ASO) test

2. **Scope:** for the qualitative and semi-quantitative determination of anti-streptolysin-O (ASO) in serum

3. **Specimen requirements:**

   A) Type of specimen: serum
   B) Mount of specimen: 2ml blood collected in plane bulb.

4. **Specimen collection:**

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Type of specimen: blood
Container used: pre-labelled plain bulb

5. Specimen reception:

Criteria for rejection: haemolysed serum/lipemic serum

: Incomplete request form

: Incomplete labelling

: Quantity insufficient

6. Principle of the test: the test is based on presence of polystyrene latex particles, coated with stabilized streptolysin O a[illegible]reptolysin O (ASO) antibodies in the patient's serum. The [illegible]ction is [illegible]visible agglutination of latex particles (card agglutinati[illegible]

7. Reference standards/r[illegible] ma[illegible]ontrol re[illegible] p[illegible] control negative control sera are provided with the kit.

8. Description of procedu[illegible]

- Perform the qual[illegible]s(refer to it insert)
- Distinct agglutina[illegible]l in the non-diluted sample.
- Perform the sem[illegible]luting as 1:2, 1:4, 1:8, 1:6, and so on. To determine the titre, the highest dilution giving agglutination is multiplied with the conversion factor 200 (sensitivity) to get the results in IU/ml.

9. Sou[illegible]es of error:

- Sample error:
  - Error in collection
  - Bacterial/chemically contaminated container
  - Markedly lipemic sera.
- Technical error:
  - Improper technique

10. Limitation:

- Marked lipemic, haemolysed and contaminated serum samples could produce non specific results.
- Serum samples having marked higher protein content may produce non specific results.
- Limit of detection of ASO:200 IU/ml

11. Storage of kit:

- Store the kit at 2-8°C

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12. Reference range: 200 IU/ml

13. Clinical significance: An elevated titre of more than 200 IU/ml indicates acute streptococcal infection. Increased ASO titres may be associated with rheumatic fever and glomerulonephritis. The titre of the ASO should be monitored every 2 weeks over a period of 4 to 6 weeks, in patients who have tested positive.

14. Critical value/alert: Positive report should immediately be informed to the concerned clinician/ward sister and entered in the clinical alert register.

SOP FOR URINE CULTURE [illegible] SITIVI[illegible]

1. Name of test: Urine cu[illegible] d s[illegible]nsitiv[illegible]

2. Scope: Isolation, Ident[illegible]ion [illegible] micro[illegible] [illegible]ens from urine sample.

3. Specimen requirement[illegible]

A. Type of specimen[illegible]

a) Male pat[illegible]

i. The prepuce should be retracted and the area (glans penis) cleaned with s[illegible]ap and [illegible]ater.

ii. [illegible]ne [after [illegible]oiding [illegible] discar[illegible]ing an initia[illegible]mall amou[illegible]] is col[illegible]cted d[illegible]ectly in to [illegible]ster[illegible]e, w[illegible]de mo[illegible]unted screw-ca[illegible]ped conta[illegible]ner(m[illegible]dstream Urine-clean catch)

iii. The container should be labelled properly and brought to the laboratories early as possible within 30 minutes of collection. If this is not possible, refrigerate specimen at 2-8°C, but keep no longer than 1-3 hours.

b) Female patient:

The vulva should be cleansed with soap and water, step (ii) to (iii) as above (as for male patients).

c) Indwelling catheterized patients:

5-10 ml of urine should be aspirated aseptically from the proximal part of the catheter (if needed, after clamping) with sterile needle and syringe, after antiseptic application over the surface of the catheter. The sample should be collected by a doctor or nursing staff.

d) Patients with condom catheters (Unconscious male patients):

The condom should be removed, glans penis cleansed with mild antiseptic, and urine collected aseptically with a simple rubber catheter.

B. Amount of specimen: 2-5 ml

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4. Specimen collection:

Work area: In laboratory and respective wards for indoor patients.

Job responsibility: medical officer.

Type of specimen: urine

Container used: pre-labelled (laboratory ID.number and investigation to be done) leak proof container.

5. Specimen rejection:

Criteria for reject[illegible]

[illegible]plete labelling

[illegible]g con[illegible]

6. Principle of the test: I[illegible] of pathogen[illegible] uri[illegible]n on suitable primary culture media, followed by iden[illegible]lo[illegible] and A[illegible] ob[illegible] test of the microorganisms isolated.

7. Apparatus and equipm[illegible]

- [illegible]
- [illegible]ration of culture media
- Fixed diameter(calibrated) loop (4mm diameter)

8. Reference standard/Reference material, control required:

- Control strains for media and biochemical tests as described in section.

9. Description of procedure:

a. Culture media used:

- Urine is inoculated on CLED (cystine lactose electrolyte deficient medium) as it favours the growth of gram positive bacteria, gram negative bacteria and yeast. It also differentiates between lactose fermenters and non-fermenters.
- Two plates of CLED medium are inoculated. The first one for t[illegible] Semi-quantitative assay and second for colony separation.
- One plate of Nutrient agar is inoculated to demonstrate swarming of Proteus species.

b. Inoculation of specimen:

- Inoculation of urine sample is to be done immediately on receipt of the specimen.
- Nichrome wire loop (no.24 SWG) is bent into flat, circular and completely closed loop of 4mm internal diameter. It is used for inoculation of urine samples.

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- Before inoculation the wires are sterilized by holding vertically in a Bunsen burner flame so that the wire becomes red-hot. The red-hot wire is allowed to cool and dipped into the specimen vertically. One loopful (0.01ml) of the specimen is then inoculated on the solid media (plate).

c. Direct microscopy of wet mount: for urine samples, microscopic examination of unspun sample is done for all specimens.

10. Estimating bacterial numbers:

The approximate number of bacteria per ml of urine is estimated by calibrated loop method. Approximate number of colonies i.e. colony forming units, is counted after incubation. This is multiplied by the dilution [illegible] ed by the in-use loop) to get the bacterial count per ml ur[illegible]

- Plates are incuba[illegible] ubator at 37[illegible] ally [illegible] ight.
- Proceed for identification and antibiotic sensitivity testing by either manual methods or miniAPI automated system, as [illegible] policy de[illegible] b[illegible] ompetent authority from time to time.

Manual method for id[illegible] ica[illegible] tibiot[illegible]
After overnight incub[illegible] bacterial colonies. If any growth is observed, c[illegible]

Identical, isolated colonie[illegible] ated in peptone water for preparation of bacterial s[illegible] ning.

- From bacterial suspension various biochemical media like TSI (Triple sugar Iron Agar slant), citrate, urease, PPA (phenylalanine agar), Bile esculin (BE) slants and tryptophan broth for indole production are inoculated. Biochemical tests like Oxidase, Catalase and Coagulase tests are done for identification of bacteria.

Antibiotic sensitivity testing:

Preparation of inoculums: pure colonies(3-4) picked up with straight wire is inoculated in the peptone water or nutrient broth and inoculated aerobically at 35 ± 2° C for 3-4 hrs till a standard turbidity is achieved. The turbidity is standardized by comparing with an opacity standard, viz.0.5 Mc Farland's standard.

- Media used for Antibiobiogram: Muller Hinton Agar Plates.
- Methods used: Disc Diffusion Method (Kirby Bauer's technique)

  The plate is uniformly seeded with the standardized inoculums by swabbing with sterile swabs. The plates are dried for 5 minutes before application of antibiotic discs.
- Discs used: commercially available antibiotic discs of recommended concentrations as per CLSI guidelines.
- The antibiotic discs are preserved at 4-8°C in desiccater. These are brought out and kept at room temperature for 30 minutes, before being applied seeded plates.

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Discs are picked up with sterilized forceps and put on the seeded plate. The discs should be about 15mm from the edge of the plate and no closer than about 25mm from disc to disc. Not more than 6 discs should be applied (90 mm petridish). Each disc should be lightly pressed down to ensure its content with the agar. It should not be moved once in place.

Within 30 minutes of applying the discs, invert the plate and incubate it aerobically at 35 ± 2° C for 24 hrs,
After overnight incubation plates are examined for zone of inhibition and using a ruler measure, the diameter (in mm) of each zone of inhibition is recorded. The endpoint of inhibition is where growth starts.

Interpretation of zone siz

Using the interpretative c pret the zo crobial, reporting the organism as "resistant" "sensitive" erately sensitive lines.

10. Report generation:

- The result is reco th og bo olo nst the sample number.
- The result is ente th uter re signatories.
- Computer genera epo and sign orized signatory of microbiology dep

11. Sources of error:

- Sample error:
- Error in collection
- Bacterial/chemically contaminated containers

12. Limitations: NA

13. Preparation and storage of media:

Different types of media are prepared for culture and biochemical identification of microorganisms. All dehydrated media are prepared, sterilized and stored as per the manufactures instructions. Pouring of sterilized media is done only in a dust free room. The media is appropriately labelled with date and time of preparation along with the signature of the person preparing the media. The whole batch or some of the plates are subjected to sterility check before use. The prepared media is used only if the results of 'quality control tests' are satisfactory.

14. Reference range: NA

15. Clinical significance:

Urinary tract infection (UTI) could be of the lower urinary tract encompassing the bladder and urethra or of the upper urinary tract infecting the ureters and kidneys. Because of shorter urethra, bacteria can reach the bladder more easily in females. All areas of the urinary tract above the urethra in healthy humans are sterile, hence urine is normally sterile.

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- Causative organisms

  E.coli is by far the commonest causes of uncomplicated community acquired urinary tract infections. Other members of *Enterobacteriaceae* can also cause UTI. The causative agents are listed.

CAUSATIVE AGENTS OF UTI: • *E.coli* • *Proteus mirabilis* • *S.aureus* • *S.saprophyticus* • *Group B streptococci* • *Enterococci*
Complicated UTI which occurs in catheterized patients or with obstruction is caused by: • *E.coli* • *Klebsiella spp* • *Enterobacter spp* • *Proteus spp* • *Pseudomonas aeruginosa* • *S.aureus*

15. Specimen post-test:

Storage time: 3 days

Storage temperature: 2-8°C

SOP FOR PUS CULTURE AND SENSITIVITY

1. **Name of test:** pus culture and sensitivity
2. **Scope :**Isolation, identification and antimicrobial sensitivity of pathogens from pus
3. **Specimen requirement:**

   A) Type of specimen:
   - Specimen should be collected by a medical officer or an experienced nurse.
   - Pus from an abscess is best collected at the time the abscess is incised and drained, or after it has ruptured naturally.
   - When collecting pus from abscesses, wound, or other sites, special care should be taken to avoid contaminating the specimen with commensal organisms from the skin.
   - Specimen should be collected before antiseptic dressing.
   - Using sterile technique, aspirate or collect the specimen in a leak proof container.
   - Alternatively if the purulent material is too less specimen from a draining sinus tract using a sterile hypodermic needle to lift up the crist surface over the sinus opening.
   - Transfer the pus to a sterile container. Specimen from patients with suspected plague or anthrax is highly infectious. Label specimens as HIGH RISK and handle them with care.

   B) Amount of specimen: 2-5 ml.

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4. **Specimen collection:**
   - Work area: in laboratory and respective wards for indoor patients.
   - Job responsibility: medical officer
   - Type of specimen: Pus
   - Container used: pre-labelled (Laboratory I.D. number and investigation to be done) sterile syringe/leak proof container.
5. **Specimen rejection:**

   Criteria for rejection: incomplete request form

   : Incomplete labelling
6. **Principle of test:** Isolation of pathogens from the pus specimen on suitable primary culture media, followed by identification tests and Antimicrobial susceptibility test of the microorganisms isolated.
7. **Apparatus and e[illegible] required:**
   - Inoculation hood for culture manipulations
   - Autoclave for sterilization of glass [illegible] preparation of culture media
8. **Reference standa[illegible]ren[illegible]material/Co[illegible]uire[illegible]**
   - Control strains for medi[illegible]iochemic[illegible]ts[illegible] described in section
9. **Description of procedure:**
   a. Describe the specimen [illegible]en fro[illegible]pected mycetoma or actinomycosis, repor[illegible]earance of [illegible]hether it contains granules.
   b. Examine microscopically:
      - Gram smear: for pus cells and bacteria
      - ZN smear: if AFB suspected
      - KOH preparation when fungal or actinomycosis infection is suspected.
      - Polychrome methylene blue: when cutaneous anthrax is suspected.
      - Dark-field microscopy to detect treponemes when yaws or pinta is suspected.
   c. Culture media used:
      - Pus is inoculated on (a) % sheep blood agar-incubate aerobically.(b) MacConkey agar-incubates aerobically (c) Nutrient agar-incubated aerobically
   d. Inoculation of specimen:
      - Inoculation of pus samples is to be done immediately on culture media plate .before inoculation the wires are sterilized by holding vertically in a Bunsen burner flame so that the wire becomes red-hot. The red-hot wire is allowed to cool and dipped into specimen. One loopful of specimen is then inoculated on the solid media (plate). A 'well' is made on one side ,the loop is heated and cooled and used to make primary,secondary,tertiary and quaternary streaks on the plate.
      - In case of a pus swab, the swab is rotated over the culture media plates to make a well and then is used for making a smear for gram stain.
      - Examine and report the culture: Blood agar, MacConkey agar and Nutrient agar- Look particularly for *S.aureus, S.pyogenes, P.aeruginosa, Proteus spp., E .coli, Enterococcus, Klebsiella spp.*
      - Proceed for identification and antibiotic sensitivity testing by manual methods as per the policy decided by the competent authority from time to time.

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e. Manual methods for identification & Antibiotic sensitivity testing

- Identical, isolated colonies (4-5) are picked up with straight wire and inoculated in peptone water for preparation of bacterial suspension. Smears are also prepared for gram staining. Follow the chart of identification for selecting test for gram positive or gram negative cocci or bacilli.
- From bacterial suspension required biochemical media like TSI (Triple sugar iron agar slant), citrate, urease, PPA (Phenylalanine agar), Bile-esculin (BE) slants and tryptophan broth for indole production are inoculated. Other biochemical tests like oxidase,catalase,coagulase tests are done for identification of bacteria
- Antibiotic sensitivity testing may be required for *S.aureus, Enterobacteriaceae* and non fermentative gram negative rods
- Preparation of inoculums: pure colonies(3-4) picked up with a straight wire is inocu[illegible]th and inoculated aerobically at 37°C [illegible]till a stand[illegible]ed. The turbidity is standardized by co[illegible]with an opacity [illegible]c Farland's standard.
- Medi[illegible] an[illegible]ogram: Mulle[illegible] ag[illegible]ates.
- Meth[illegible]disc [illegible]metho[illegible]by[illegible]technique)

  The [illegible] uniform [illegible]ed inoculums by swabbing with [illegible] sy[illegible] The p[illegible]efore application of antib[illegible]dis[illegible]
- Dis[illegible] recommended con[illegible]
- The [illegible]ater. These are brought out [illegible]fore being applied seeded plates.
- Dis[illegible] are pic[illegible]ed up w[illegible] sterilize[illegible] forceps an[illegible] pu[illegible] on the [illegible]eeded p[illegible]te. The disc[illegible] should b[illegible] about 15 mm fro[illegible] the edge o[illegible] the plate an[illegible] no clo[illegible]er than abo[illegible]t 25mm fr[illegible]m dis[illegible] to [illegible]isc. N[illegible]t more than 7 d[illegible]sc should [illegible]e app[illegible]ed (90mm Petri dish).each disc should be lightly pressed down to ensure its contact with the agar. It should not be moved once in place.
- Within 30 minutes of applying the discs, invert the plate and incubate it aerobically at 35 ± 2°C for 24 hrs.
- After overnight incubation plates are examined for zone of inhibition and using a ruler measure, the diameter (in mm) of each zone of inhibition is recorded. The end point of inhibition is where growth starts. Interpretation of zone sizes.
- Using the interpretative chart, interpret the zones size of each antimicrobial, reporting the organism as 'Resistant' 'sensitive' and 'moderately sensitive' as per CLSI guidelines.

10. Report generation:

- The result is recorded in the log book for bacteriology tests against the sample number.
- The result is entered in the computer by authorized signatories.

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- Computer generated report is checked and signed out by an authorized signatory of microbiology department.

11. Sources of error:

- Sample error: error in collection

12. Limitations: N.A.

13. Preparation and storage of media:

Different types of media are prepared for culture and biochemical identification of microorganisms. All dehydrated media are prepared, sterilized and stored as per the manufactures instructions. Pouring of sterilized media is done only in a dust free room. The media is appropriately labelled with date and time of preparation along with the signature o the person preparing the media. The whole batch or some of the plates are subjected to sterility check before use. The prepared media is used only if the results of 'quality control tests' are satisfac[illegible]

14. Reference range: [illegible] detected.

15. Clinical significance:

S.au[illegible] m[illegible] common pa[illegible]ola[illegible] from subcutaneous abscesses and skin wounds. [illegible] and [illegible]llin resis[illegible]tra[illegible] *S.aureus* are common causes of hospital-acqui[illegible]tions. *P*[illegible] infected burns and hospital-acquired infectio[illegible] *col*[illegible]*oteus* [illegible] *cteroides* are the most common pathoge[illegible]ola[illegible] abdom[illegible]nds. *M.tuberculosis* is associated with c[illegible] with HIV diseases caused by *S.aureus, S.p*[illegible]

- CAUSATIVE ORGANISMS:

  a. Gram positive: [illegible] *Anaerobic Streptococci,* [illegible] *d other Clostridia, Actinomycosis, A.israeli.*

  b. Gram negative: *K.pneumonae, P.aeruginosa, E.coli, Bacteroides spp., Pasteurella spp., Proteus*

  c. Commensal: *S.aureus, S.epidermidis, S.viridans, Micrococci, Diphtheroids, Coliforms, P.acnes.*

16. Specimen post-test:

- Storage time:3 days
- Storage temperature: 2-8°C.

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CHAPTER 2

Work done and work observed in laboratory

- **Work done and observe**

Date	Work done and observed.
4th June 2018	**Observed:** **Sample** : Sputum • Gram stain:-gram positive cocci • ZN stain:- AFB seen Next day {5th June 2018} Co[illegible]C), Blood agar (BA), Chocolate ag[illegible] -sr[illegible] MacConkey [illegible]ive cocci. **Result:** - no pathogen isolated after 24hrs of incubation.
5th June 2018	**1.S[illegible]bus[illegible]** **V[illegible]:** [illegible]n stai[illegible]positive cocci arrange in [illegible]pair [illegible] ZN [illegible]no AF[illegible] **V[illegible]ob[illegible]** N[illegible] C[illegible]onkey agar (MAC), Blood ag[illegible] - s[illegible] - b[illegible] • Catalase:- +ve • Coagulase :- slide test and tube test +ve • Sugars:- +ve ASO is also performed and interpreted according to the ASO chart. **Result:** - *Staphylococcus aureus* is isolated after 48hrs of incubation. **2.Sample :- Vaginal swab** **Work done:** • Gram stain:- gram positive bacilli **Work observed:-** Colony observation: No growth observed on NA, MAC, BA. **Result:** - no pathogen is isolated after 48 hrs of incubation. **3.Sample:-QC** **Work observed:-** • Gram stain:- Gram positive cocci • ZN stain: - AFB seen.
6th June 2018	**Sample :- QC** **Work observed:-** • Gram stain:- Gram positive cocci • ZN stain:- AFB seen
7th June 2018	**Sample :- QC** **Work observed:-**

What is the sample for QC?

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	• Gram stain:-gram positive bacilli • ZN stain:- AFB seen
8th June 2018	1. **Sample:- QC** • Gram stain:- gram positive cocci • ZN stain:-AFB seen 2. **Sample:- Urine** • Gram stain:-no org. With no pus cells • CLED agar:- negative after 48 hrs of incubation 3. **Sample:- Urine** • Gram satin:- no org with no pus cells • CLED agar:- negative after 48 hrs of incubation 4. **Sample:-Urine** • Gram stain:-no org with no pus cells [illegible] hrs of incubation [illegible] Gram sta[illegible] Till 5th day o[illegible] n [illegible]hogen was found.
9th June 2018	W[illegible] [illegible]ple [illegible] • Gr[illegible]os[illegible] ZN st[illegible]en Sa[illegible] Urine Gram stain: - moderate number of gram positive cocci in single with gram positive bacilli seen with few pus cells. [illegible]hows gram positive bacilli [illegible] Citrate: [illegible] TSI slant:- A+ ve /AG +ve Suga[illegible]s:- [illegible]G +ve Indo[illegible] +ve Re[illegible]lt:- *E.coli* is isolated after 48hrs of incubation
11th June 2018	**Work observed and done:** 1. **Sample:- PUS** • Gram staining:- no org. with no pus cells • ZN stain:- no AFB seen • NA,MAC,BA shows no growth after 48hrs of incubation 2. **Sample:- Urine** • Gram stain:-no org. with no pus cells • CLED agar shows no growth after 48 hrs of incubation 3. **Sample:-QC** • Gram stain:-gram positive cocci seen • ZN stain:- AFB seen
12th June 2018	**Work done and observed** 1. **Sample:-Sputum** • Gram stain:-gram positive cocci in pair + gram negative bacteria with pus cells and epithelial cells. • ZN stain:- AFB not seen • BA, CA, MAC streaked. • Smear from MAC shows gram negative non motile bacteria.

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	• Biochemical test :- - Citrate:- +ve - TSI:- +A/AG +ve - Sugars:- +ve - Oxidase:- -ve - MR-VP:- MR +ve, VP +ve - PPA:- -ve - Urease:- +ve - Indole:- -ve **Result:** - *Klebsiella pneumonia* is isolated after 48 hrs of incubation. **2. Sample:- plural fluid** • Gram stain: - no org. no pus. • ZN stain: - AFB not seen.
13th June 2018	**Work observed:** **Sample:- QC** • Gram stain:- gram positive cocci • ZN stain:- AFB seen
14th June 2018	**Work observed:** **Sample:- QC** • Gram stain:- gram positive cocci • ZN stain:- AFB seen
4th june-11th June 2018	**Work observed:** **WATER CULTURE (MPN METHOD)** ➢ **4th June 2018** ✓ **4 SAMPLES:-** - 1.Unsatisfactory for drinking - 2.satisfactory for drinking - 3.unsatisfactory for drinking - 4.satisfactory for drinking ➢ **7th June 2018** ✓ **2 sample:-** - 1.Unsatisfactory - 2.satisfactory **11th June 2018** - 1.satisfactory

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Work done :-

- **Peptone water preparation:**

✓ 100ml of Distilled water + 1gm of peptone type I + 0.5 gm of Nacl boil and then autoclave it. After autoclave adjust the ph 6-7.

✓ Use this peptone water for preservation of the bacteria.

- Take 850µl of peptone water + 1 loopful of bacteria .incubate it for 24 hours for growth and add glycerol to preserve it for long period of time.

- **Nutrient agar(for 500 ml):-**

✓ 14 gm NA agar powder + 0.6 gm agar powder

- **MacConkey broth purple(100 ml):-**

✓ Single standard for 5ml test tube – 4gm MCBP

✓ Double standard for 10ml test tube and 50ml bottle – 16 gm MCBP

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- **Muller Hinton's agar (for 500ml):-**
  - ✓ 19 gm Muller Hinton's agar powder + 0.6 gm agar powder
- **Sugars (0.1%):-**
  - ✓ Phenol red maltose broth – 2.1gm in 100ml
  - ✓ Phenol red dextrose broth – 2.1gm in 100ml
  - ✓ Phenol red sucrose broth – 2.1gm in 100ml
  - ✓ Phenol red lactose broth – 2.1gm in 100ml
  - ✓ Phenol red manitol broth – 2.1gm in 100ml

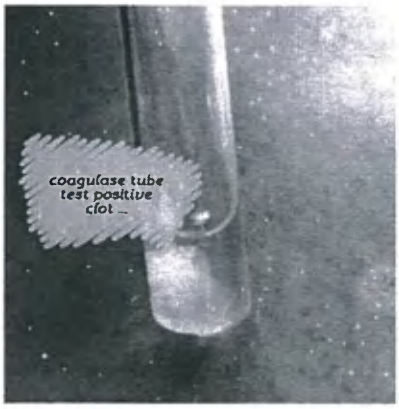
Work observed:-

- **D test :-**
  - ✓ D[redacted]ganism on Muller Hinton agar (MHA) for [redacted] Sheep blood (for Group B *Streptococci*) and placing a 15-µg Erythromycin disk near to a 2-µg Clindamycin disk. After overnight incubation, a flattening of zone of inhibition around the Clindamycin disk near the Erythromycin disk (producing a zone of inhibition shaped like the alphabet D) is considered a positive result and indicates that the Erythromycin has induced Clindamycin resistance (a positive "D-zone test"). This test can help us to [redacted]mine whether Clindamycin should be reported as susceptible (when D [redacted] negative) or as resistant (when D test is positive) in erythromycin [redacted]ant strains.

If D-test is positive then what is the susceptibility of clindamycin?

CHA SAT

- **Coagulase test:-**



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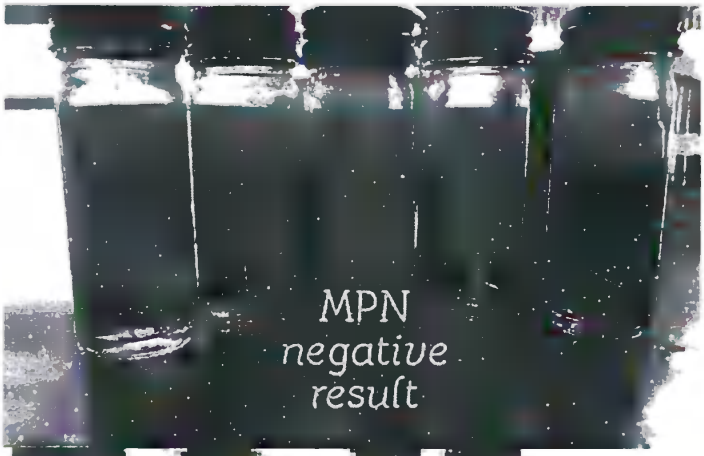
Tube test **Slide test**

- **MPN test**
  - ✓ **Negative result:-**



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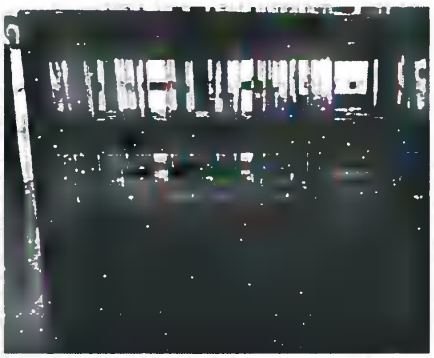
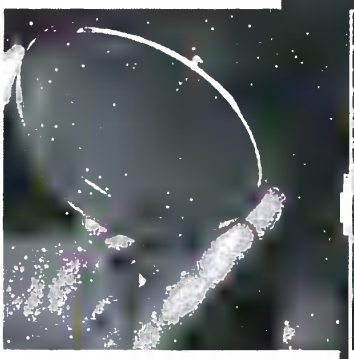
Has formation +ve in bgbb 2nd day procedure for MPN method for water analysis



Indole test positive for fecal ecoli

- Plate ob



Enterococcus on chocolate agar

Enterococcus on chocolate agar

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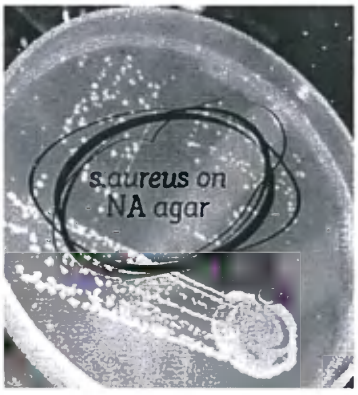
Enterococcus on blood agar



Klebsela on Mac ATCC

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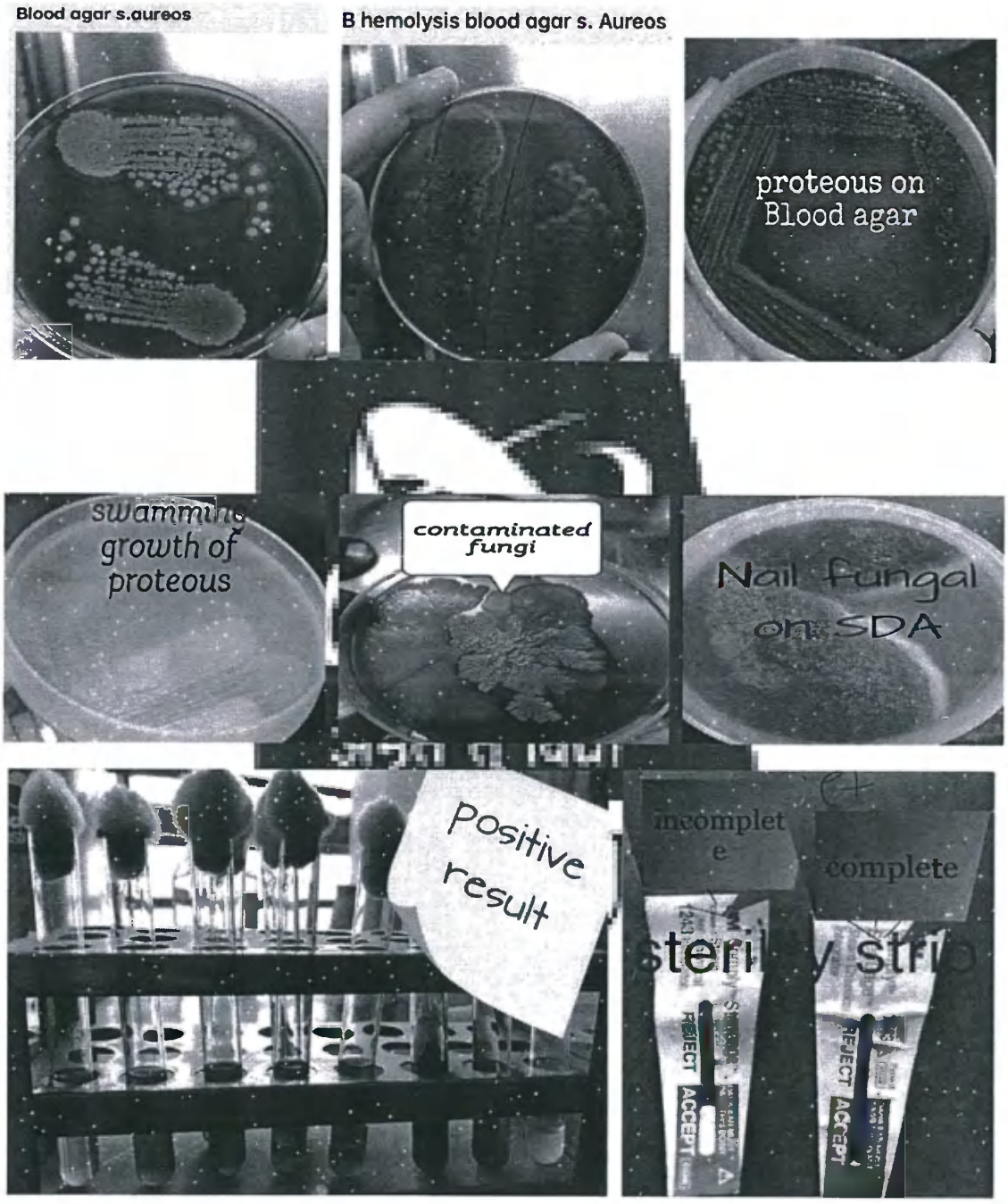

- **Microscopic observation:-**

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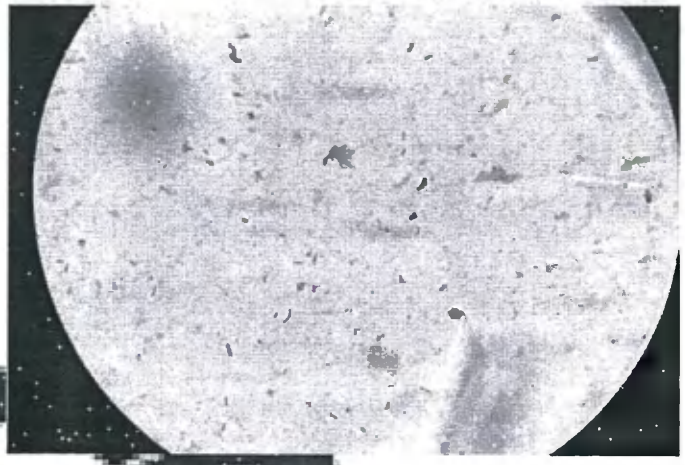
Vaginal gram staining

Gram positive cocci in chain single and bunch from blood sample



Gram negative rods klebsela from sputum

Result of biochemical test done of the previous sample of Proteous mirabilis:-

In TSI mention the result and not negative /positive.

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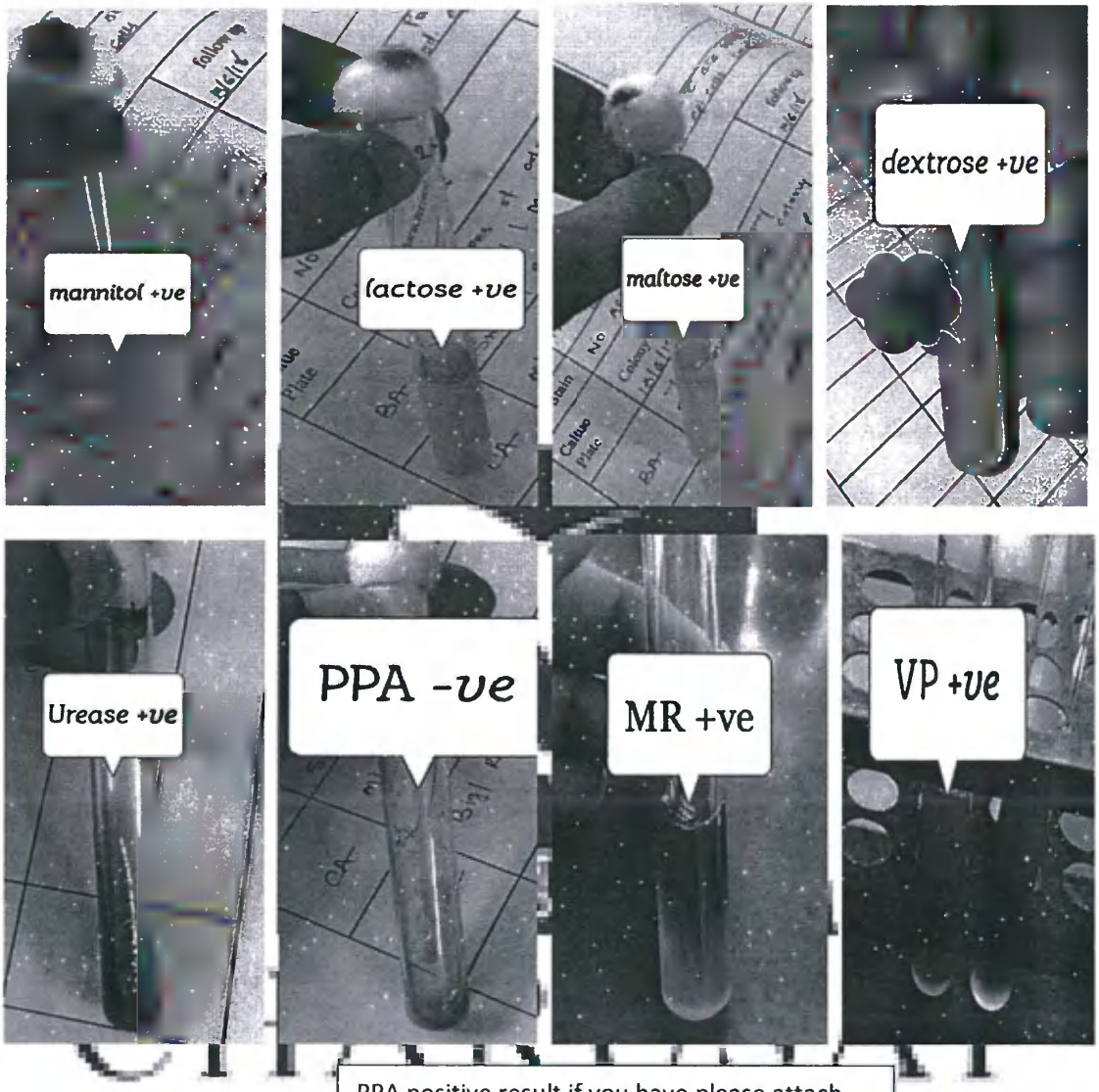

PPA positive result if you have please attach

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CHAPTER 3

Write duration from date to date

CONCLUSION:-

I did my training at S.S. HOSPITAL, PETLAD. The laboratory is very organized and well managed. During the training I have gain lot of knowledge practically & learn about the code of conduct of clinical laboratory. I am very thankful to CHAROTAR INSTITUTE OF PERAMEDICAL SCIENCE COLLAGE for this great opportunity of 15 day training in laboratory from 4th June to 15th June.

In the microbiology department total 3 staffs are working. They all are co-operative in nature. They give us guidance & support whenever required during training.

In this department total 12 samples were some that include blood, urine, body fluid, stool, sputum, etc. From which only 2 samples shows positive results.

Other 10 samples are [illegible] control and all [illegible] ults.

And 8 samples are of [illegible] water [illegible] sis from [illegible] s excellent for drinking, 3 are unsatisfactory for dri[illegible] 4 are [illegible]

Here in the laborator[illegible] one by [illegible] d of the day reports were checked by the DR.A[illegible] PA[illegible] next day [illegible]

This training has prov[illegible] e the instruments, clerical work, how to deal wi[illegible] many more other experiences, which m[illegible]

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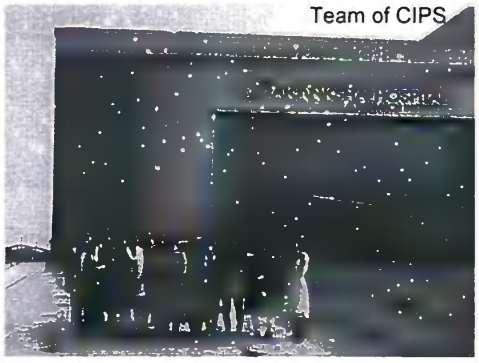
CIPS

CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY
FACULTY OF MEDICAL SCIENCES
CHAROTAR INSTITUE OF PARAMEDICAL SCIENCES (A Constituent of CHARUSAT)
DEPARTMENT OF MEDICAL LABORATORY TECHNOLOGY

A REPORT ON ONE DAY EDUCATIONAL WORKSHOP TO AKANKSHA HOSPITAL & RESEARCH INSTITUTE 14th NOVEMBER, 2017

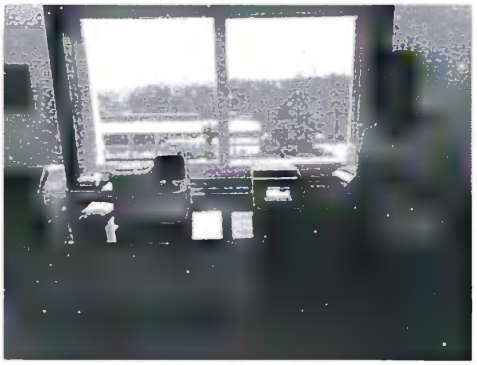
Department of Medical Laboratory Technology from Charotar Institute of Paramedical Sciences (CIPS), a constituent of CHARUSAT has visited Akanksha Hospital & Research Institute, Anand on 14th November 2017, as a part of industrial visit & workshop. 10 post graduate students along with 3 faculty members (Dr. Dhara Patel, Dr. Artee Tyagi and Mrs. Amita Patel) reached the destined institute at 10:45 am. Akanksha Hospital, under the flagship of Satkaival Trust is a well-known In vitro Fertilization clinic nationally as well as internationally.


Team of CIPS

Mrs. Harsha Ahir (Chief Embryologist, Akanksha IVF centre) and her Asistant Ms. Kruti Patel (M.Sc. Embryology) gave an introduction about vision and mission of Ankansha IVF Hospital and Research Institute. Our Paramedical team visited various departments of the institute from 11:00 am to 1:30 pm in the noon.

Our team started from Physiotherapy department and its importance during all the three trimesters of pregnancy. The head of the physiotherapy department shared her experiences in treating patients with various medical complications. The next department was dental department and we were explained about all different types of neonatal dental problems and prenatal dental problems. They shared with us the latest medical therapy they are using for treating patients. As a part of treatment they use platelet rich plasma injections for regeneration of new dental tissues. Another attractive department was of Cosmetology, the chief cosmetologist again shared her experiences and ongoing recent techniques in the field of cosmetic surgery, liposuction and various other post pregnancy treatments. She also explained the usage of platelet rich plasma in hair transplantation, cosmetic surgery and face lifting.

Our next destination was the Molecular Biology Lab where a detailed explanation by Ms. Shefali helped us tknow the latest techniques of DNA fingerprinting, karyotyping and Polymerase Chain Reaction based determination of various genetic mutations. She also showed us an Illumina platform based Ion Torrent Next Generation Sequencing Technique to rule out certain rare genetic mutation right from the developing embryo. She also explained various basic instruments used in the molecular biology lab like centrifuge, SDS gel units, Agarose gel units.


Equipments in laboratory

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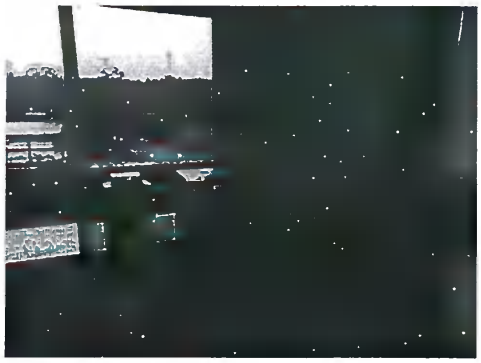
Different Equipments in laboratory



Dr. Ketan, Chief Pathologist of the Pathology department gave detailed information about various immunological based tests for hormones. The pathology department was well equipped with modern instruments including Cobas, Automated ESR, Coagulometer, Automated Urinalysis, Biochemistry Analyzer and Haematological Cell Counter. He interacted with students by asking them questions and to which our students responded very well.

We departed from pathology lab to visit the final and the most awaited lab of the hospital which was the Embryology lab. Ms. Harsha and Ms. Kruti showed us various techniques used in collection of embryo and semen. She in detail explained the in vitro fertilization technique and its importance in infertility. She showed her painstaking work for the selection of best embryo to be implanted. She demonstrated the in vitro stage by stage development of the embryo through video. She also highlighted another technique called Intracytoplasmic Sperm Injection (ICSI). We had a lunch break from 1:30 pm to 2:00 pm where we enjoyed the meal served inhouse.

Photographs showing different activities done at Akanksha hospital

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The second session from 2:00 pm onwards was interactive session where Dr. Maulina Patel, Ms. Harsha Ahir and Ms. Kruti Patel gave power point presentation on various fertilization techniques and showed various videos showing the whole IVF and ICSI technique and cleared all the doubts regarding it which were raised by students. Finally we left the institute at 3:45 pm with all the knowledge absorbed throughout the visit. We returned back the campus by 4:15 pm. The visit created interest in students and encouraged to think about research going on in the field.

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CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY

CHARUSAT

Formed under Gujarat State Act No. : 8 of 2009

Accredited Grade A by NAAC

Circular

Department of Medical Laboratory Technology (MLT) from Charotar Institute of Paramedical Sciences (CIPS) is organizing one-day visit at Akanksha IVF Hospital & Research Institute, Anand on 14th November 2017, as a part of industrial visit for post graduate students of the department. Mrs. Harsha Ahir (Chief Embryologist) and Ms. Kruti Patel (M.Sc. Embryology) from Akansha Hospital will be monitoring the visit.

Dr. Darshan Patel

Principal, CIPS

Dr. Dhara N Patel

HOD, MLT, CIPS

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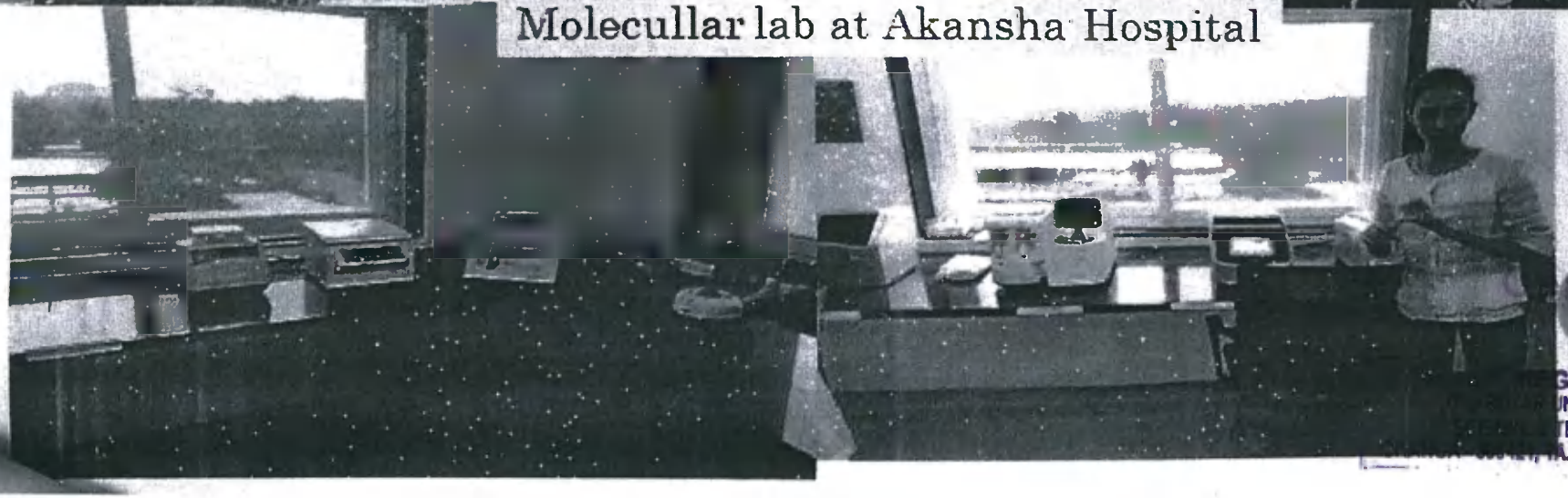
Visit to Akansha Hospital
Date: 14/09/2017

Molecullar lab at Akansha Hospital



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CHAROTAR INSTITUTE OF PRAMEDICAL SCIENCE
DEPARTMENT OF MEDICAL LABORATORY TECHNOLOGY

Educational tour to Akanksha Hospital
MSMLT STUDENTS
ACADEMIC YEAR 2017-2018

Resource Person Detail

Name	Dr. Harsha Bhadraka Ph.D
Designation	Lab Director & Chief Embryologist
Department	Embryology & IVF
Organisation	Akanksha Hospital & IVF centre
Phone No.	7069255511 02692-617300

Name	Piyush Chudasma
Designation	Research Scientist
Department	Research & Development
Organisation	Sat Kaival Hospitals (pvt) LTD
Phone No.	9974447914

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SCIENCE & TECHNOLOGY
CHANGA - 388421, TA. PETLAD, DI. ANAND

CHAROTAR INSTITUTE OF PRAMEDICAL SCIENCE
DEPARTMENT OF MEDICAL LABORATORY TECHNOLOGY

Educational tour to Akanksha Hospital
MSMLT STUDENTS
ACADEMIC YEAR 2017-2018

Resource Person Detail

Name	Shefali Macwan
Designation	Research Associate
Department	Research & Development
Organisation	Sat Kaival Hospitals (pvt) LTD
Phone No.	8153979893

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Curriculum Vitae

Dr. Harsha Bhadarka

Ph.D

Diploma in IVF and reproductive medicine (Keil, Germany)

Director - IVF lab,

Chief Embryologist,

Secretory – Sat kaival hospital private limited institutional ethics commeette

Akanksha Hospital and Research Institute.

ANAND,

Gujarat,

INDIA.

E mail: harshabhadarka@yahoo.co.in

Experience

20years' experience in the field of clinical embryology, currently working as Lab Director and Chief Embryologist at Akanksha Hospital and Research Institute.

Patent

Applied patent in Male infertility "A method of In vitro maturation of spermatid"

Menberships:

- ISAR(indian Society for assisted reproduction) life time membership
- ESHRE(Europesn society of human reproduction and embryology) life time membership
- IFS(Indian fertility society) life time membership
- ACE(Academe of clinical embryologist) life time membership

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- ASPIRE(Asia Pacific Initiative on Reproduction) membership
- **Objectives**
- IVF Laboratory Staff management /Laboratory Director Services. Contract on-call embryology services, new IVF lab set-up. Embryology services like to perform all hands on embryology and Andrology work, embryo culture, embryo and sperm cryopreservation/ vitrification, assisted hatching, ICSI, TESE, PESA, micro TESE, ROSI/ROSNI, embryo biopsy(We have in house genetic laboratory, so embryo biopsy is routinely done). PRP preparation in ovarian, testicular and endometrium rejuvenation, implement quality control, quality assurance (as present clinic is NABH, ISAR and ICMR accredited). Responsible for initial IVF laboratory set-up, equipment set-up and purchase. Act as a laboratory director with duties including write-up of laboratory manuals, protocols, and laboratory regulatory policies

Publications:

- Dr. Nayana Patel, **Harsha Bhadarka**, Kruti Patel, Salil Vaniawala, Arpan Acharya, Pratap N., Mukhopadhyaya, Nilofar Sodagar, Embryo genome profiling by single-cell sequencing for successful preimplantation genetics diagnosis in a family harboring CLO4A1 c. 1537G>A; p. G513S mutation Journal of human reproductive sciences 2016;9:200-6

- **Bhadarka HK**, Patel NH, Patel KB, Jadeja YD. Could zona-free blastocyst transfer be the next step in optimizing *in vitro* fertilization outcomes? A case report of successful outcome after zona-free fresh embryo transfer with pre implantation genetic screening. IVF Lite 2016;3:124-7.

- **Harsha K Bhadarka**, Nayana H Patel, Kruti B Patel, Nilofar R Sodagar, Yuvraj D Jadeja, Niket H Patel, Molina N Patel, Atul V Patel, Darshan H Patel, Jagdish

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S Patel. Study of Morphokinetics in Day 3 Embryo with Implantation Potential and Effect of Sperm Cryopreservation on Embryogenesis, Int J Infertil Fetal Med 2017;8(2):1-7.

- Nayana H. Patel, Yuvraj D. Jadeja, **Harsha K.. Bhadarka**, Molina N. Patel, Niket H. Patel, Nilofar R. Sodagar. Insight into Different Aspects of Surrogacy Practices, J Hum Reprod Sci 2017

- **Harsha Bhadarka**, Nayana Patel Kruti Patel, Yuvraj Jadaja , Niket Patel, molina Patel "A first case of successful implantation and live birth after double trophectoderm biopsy before and after vitrification on the same cohort of blastocyst."

- **Harsha Bhadarka**, Dr. Nayana Patel, Dr. Niket Patel, Dr. Molina Patel, Kruti Patel, Nilofar Sodagar, Ajay Phatak, Dr. Jagdish Patel. Impact of embryo co-culture with cumulus cells on pregnancy and implantation rate in patients undergoing in vitro fertilization using donor oocyte. The Indian Journal Of Medical Research.
- Nayana H. Patel, **Harsha K. Bhadarka**, Yuvraj D. Jadeja, Molina N. Patel, Niket H. Patel, Nilofar R. Sadogar Regenerative Medicine for Infertility: What is Known and What Future Holds?

- Chapter "New Techniques in IVF Lab" published in ART book named The Techniques of IVF Made Easy, Second Edition: 2018

- Preimplantation Genetic Testing , Volume 12, NEXUS Indian fertility Society & ORIGIO India Initiatives, August 2019

- Chapter "Triple parenting" published in ART book named Advances in Assisted Reproductive Technology, 2019.

- Chapter "co culture tachniques" published in ART book named Advances in Assisted Reproductive Technology, 2019.

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Attended Trainings and conferences as a faculty and Delegate:

- ✓ Training at Singapore Christopher Chen IVF Center in 2008 for modified method of slow freezing ,Embryo thawing assessment of post thaw survival ,All aspect of vitrification including selection of carries process of vitrification ,warming of embryo, post warming assessment of eggs and embryo. strict morphological assessment using Kruger's criteria. Sperm function tests-hyluronon binding assay and sperm DNA Fragmentation Test. Embryology Laboratory Trouble Shooting.

- ✓ International Conference and workshop for Oocyte banking, methods maintenance and Embryology techniques at Spain in 2004.

- ✓ Participation of hands on workshop for PRE-IMPLANTATION OF GENETIC DIAGNOSIS conducted by Reliance Life sciences at Mumbai in september 2010.

- ✓ Participation in workshop for Human embryonic Stem Cell Culture Techniques conducted by Reliance Life sciences at Mumbai in November 2011.

- ✓ Participation in workshop for mammalian Cell Culture Techniques conducted by Relience Life sciences at Mumbai in September - 2011.

- ✓ Participation in EMPOWERING EXCELLENCE IN EMBRYOLOGY WORKSHOP AND CONFERENCE 2011conducted by EART Mumbai & Alpha research scientists.

- ✓ Fellowship for ,preparing of MEF feeder from rats, Handling of live mouse, Embryonic stem cell culture techniques , freezing and Thawing of Stem cells basic knowledge for clinical application of stem cells IVF procedures, Vitrification and warming method

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for eggs and embryo freezing, quality management and maintenance of IVF and Stem cell lab. at CHA gagman medical center, CHA research institute, CHA university, Korea in 2012.

- ✓ Stem cell training of one month at Akanksha PVT. LTD. – ANAND (Gujarat) by International Faculty Dr. Paul, Dr. Nadin, Dr. Richie (Australia)

- ✓ Participated as faculty in IVF and IUI Training programs organized by Bavishi fertility Clinic.
- ✓ As a Faculty Diploma in IVF and reproductive medicine courses organised by UKSH, Keil University, Germany,2018

- ✓ Faculty at ACE masterclass,2018 ,Mumbai.

- ✓ Workshop attended on cryopreservation of ovarian tissue and ovarian tissue activation organized by Anderson clause, copenhegan, Denmark - 2018

Clinical trial projects of various companies in ART techniques:

1. A phase iv clinical trial named PALO study (study of ovarian response to recombinant gonadotrophins in controlled ovarian hyper stimulation for ART in women with poor response and/or advanced reproductive age in Asia)
2. A prospective, comparative, randomized multicenteric phase iii study to compare the safety, efficacy of follicle stimulating hormone of Intas biopharmaceuticals Ltd against Gonal-f of EMD Serono for the induction of ovulation in infertile female subjects.
3. A study to evaluate the impact of different controlled ovarian stimulation protocols on physical and psychological burden in patients undergoing In-Vitro Fertilization/In-Vitro Cytoplasmic Sperm Injection.

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4. Multicentric Randomized controlled growth of GnRh antagonist v/s long GnRh for COH in IVF-ET.

Guided UG & PG students for their annual dissertation works for embryology projects.

HARSHA BHADARKA

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Contact

www.linkedin.com/in/piyush-chudasama-13383962 (LinkedIn)

Top Skills

Cell biology, Animal tissue culture, Pharmacology
Research
Biotechnology

Languages

English
Learning Spanish
Hindi

Honors-Awards

CSIR UGC NET- LS

Piyush Chudasama

Scientist By Profession and Entrepreneur by Chance....:)
Anand

Summary

I am passionate about science specially for my area, Biochemistry and cell biology. The objectives are developing myself for the science community as much as i can do.

Experience

BPC drafting services (www.bpcdrafting.com)
Assistant Managing Director
September 2016 - Present (4 years 5 months)
Ahmedabad Area, India

Though i do not have any specialization in the architectural field, i am helping as assistant managing director of our own start up. Mostly i am working as public relation officer for the start up. Also utilizing my basic skills of power point, corel draw and other adobe softwares for drawing.

Sat Kaival Hospital Pvt Ltd
Research Scientist
December 2015 - Present (5 years 2 months)
India

Working with world renowned IVF clinic (Dr Nayana Patel's IVF clinic). Holding a Key position in molecular diagnostics division of the company. Experience of more than 100 sequencing run for PGS (preimplanation genetic screening). Other then these, Our team work for developing novel assays for diagnosis, specifically in the field of embryology and gynecology.
Apart from molecular work, also working as in charge of cell biology lab. Culturing and characterization of bone marrow concentrate for research purpose is our primary goal. I am also developing cell based assays for variety of Ayurvedic formulations for Andrology applications.

Charotar University of Science & Technology (CHARUSAT)
9 years 1 month

Research Scholar
January 2012 - Present (9 years 1 month)
Anand, Gujarat

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i am working as Animal tissue culture incharge and routinely involved in experiments like MTT assay, Anti-apoptotic assay, Comet assay, Antioxidant assays. I am also involved in identification and purification of bio active compounds which can be utilized for therapeutic purpose, specially diabetic complications. Other work inculude drug transportation studies using caco 2 as model system.

Project Assistant
January 2014 - January 2016 (2 years 1 month)
Anand

Anand Agricultural University
Research Student
October 2014 - December 2015 (1 year 3 months)
Anand

PERD Centre
Research Scholar
January 2011 - October 2011 (10 months)

I was working in Department of Pharmacology and toxicology. I have learnt handling, dosing of rat and mouse. I have also learnt some of the animal model development like streptozotocin induced diabetes type II, Uninephroctomy model for hypertension, stroke model. Have understood basics of pharmacology for drug development and testing.

Centre for Environment Education
Project assistant
October 2010 - January 2011 (4 months)

I was working as part time project assistant in a project which aimed for environment education and basic learning among school students.

Intas Pharmaceuticals
QC/R & D
May 2010 - December 2010 (8 months)

I was working mostly with HPLC (Agilent technologies). Checking stability of the domestic as well as US-FDA approved drugs was my job description.

St. Xavier's College
Student
2005 - 2008 (3 years)

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Education

Gujarat University

Master's Degree, Biochemistry · (2008 - 2010)

St xavier's collage, Ahmedabad

Bachelor's Degree, Biochemistry/Biotechnology · (2005 - 2008)

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Shefali Macwan

A/15 Sharon Park,
B/H Heart Hospital,
Mission Road,
Nadiad. Gujarat. India
08153979893
shefali2790@gmail.com
linkedin.com/in/shefali-macwan-7668474a

Well organized, Result-driven Research Biologist specialized in Molecular biology and Cytogenetic possessing extensive research and experimental experience and a proven ability to manage challenging research schedules while working in highly demanding environment.

- Genetic material extraction
- PCR, qPCR, PCR-RFLP
- Agarose Gel Electrophoresis, SDS-PAGE
- Plant Tissue Culture, Animal Tissue Culture
- TA-Cloning
- DNA Barcoding
- Sequencing
- Microarray
- Softwares: Sequencing analysis, SeqScape, BioEdit, MEGA, Primer3, Clone Manager, CLC workbench, Prinseq, FastQC
- Literature reviews
- Organizational, analytical and record-keeping (Data entry)
- Precision and productive
- Excellent observer and time management skill
- Team player as well as work independently
- Oral and written communication
- Proficient with safety & hazard protocol
- Proficiency with Microsoft Office

Work Experience

19TH JUNE 2018 – TILL DATE
Research Associate / Sat Kaival Hospital Pvt. Ltd., Anand, India

- RNA and DNA extractions from samples such as blood, serum, tissue for genomic analyses
- Contributed to the amplification and quantification of several samples using the PCR (multiplex, nested) system for potential pathogenic bacterial and viral agents.
- Daily restriction digest, electrophoresis, and spectrophotometric analysis.
- Design, optimization, validation and Implementation of reverse transcription polymerase chain reaction (RT-PCR) clinical diagnostics assay to detect HSV, HIV, CMV, Toxoplasm in original patient specimens.
- Optimize and validate real-time PCR assays for the rapid detection and identification of viruses.
- Maintaining a clean and efficient laboratory setting, including calibration of instruments such as thermal cyclers.
- Responsible for inventory management and sample organization.
- Conducted supplemental scientific literature research and presented data.

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- Provided technical expertise and served as task lead in support of internal programs.
- Performed data generation, collection, documentation, analysis and presentation.
- Managed laboratory functions including organization, ordering of supplies and scheduling equipment use.
- Responsible for writing SOPs and maintaining detailed laboratory notebook.
- Identify problems, troubleshoot and take corrective actions to rectify instrumentation/sample issues.
- Record and maintain study data according to departmental SOP and protocol guidelines.
- Supervised and trained 35+ graduate and undergraduate students for PCR, PCR-RFLP, RT-PCR, agarose gel electrophoresis.

1ST APRIL 2017 - 19TH FEBRUARY 2018
Senior Research Assistant / Sat Kaival Hospital Pvt. Ltd., Anand, India.

- RNA and DNA extractions from samples such as blood, serum, tissue for genomic analyses
- Contributed to the amplification and quantification of several samples using the PCR (multiplex, nested) system for potential pathogenic bacterial and viral agents
- Daily restriction digest, electrophoresis, and spectrophotometric analysis.
- Design, optimization, validation and Implementation of reverse transcription polymerase chain reaction (RT-PCR) clinical diagnostics assay to detect HSV, HIV, CMV, Toxoplasm in original patient specimens.
- Optimize and validate real-time PCR assays for the rapid detection and identification of viruses.
- Maintained a clean and efficient laboratory setting, including calibration of instruments such as thermal cyclers
- Responsible for inventory management and sample organization.
- Conducted supplemental scientific literature research and presented data
- Provided technical expertise and served as task lead in support of internal programs
- Performed data generation, collection, documentation, analysis and presentation.
- Managed laboratory functions including organization, ordering of supplies and scheduling equipment use.
- Responsible for writing SOPs and maintaining detailed laboratory notebook.
- Identify problems, troubleshoot and take corrective actions to rectify instrumentation/sample issues.
- Record and maintain study data according to departmental SOP and protocol guidelines.
- Supervised and trained 15 graduate and undergraduate students for PCR, PCR-RFLP, RT-PCR, agarose gel electrophoresis.

5TH DECEMBER 2016 - 31ST MARCH 2017
Research Assistant / Akanksha Hospital & Research Institute, Anand, India.

- RNA and DNA extractions from samples such as blood, serum, tissue for genomic analyses

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- Contributed to the amplification and quantification of several samples using the PCR (multiplex, nested) system for potential pathogenic bacterial and viral agents
- Daily restriction digest, electrophoresis, and spectrophotometric analysis.
- Design, optimization, validation and Implementation of reverse transcription polymerase chain reaction (RT-PCR) clinical diagnostics assay to detect HSV, HIV, CMV, Toxoplasm in original patient specimens.
- Optimize and validate real-time PCR assays for the rapid detection and identification of viruses.
- Maintained a clean and efficient laboratory setting, including calibration of instruments such as thermal cyclers
- Responsible for inventory management and sample organization.
- Conducted supplemental scientific literature research and presented data
- Provided technical expertise and served as task lead in support of internal programs
- Performed data generation, collection, documentation, analysis and presentation.
- Managed laboratory functions including organization, ordering of supplies and scheduling equipment use.
- Responsible for writing SOPs and maintaining detailed laboratory notebook.
- Identify problems, troubleshoot and take corrective actions to rectify instrumentation/sample issues.
- Record and maintain study data according to departmental SOP and protocol guidelines.
- Supervised and trained 09 graduate and undergraduate students for PCR, PCR-RFLP, RT-PCR, agarose gel electrophoresis.

29TH NOVEMBER 2013 – 4TH DECEMBER 2016
Research Fellow / Anand Agricultural University, Anand, India.

- DNA extractions from samples such as blood and tissue for genomic analyses by manual method.
- Daily PCR, restriction digest, electrophoresis, and spectrophotometric analysis.
- Performed Gel Electrophoresis.
- Designed PCR primers for amplification, and cloning
- Catalogued and analyzed DNA sequences using BLAST (NCBI)
- 16S and 18S rRNA gene amplification and sequencing
- Preparation and sequencing of DNA samples on ABI 310, 3730, and 3500
- Sequence analysis by SeqScape and BioEdit.
- DNA Barcoding of dragonfly, damselfly, fish, frog, spider.
- Troubleshooting problematic sequencing reactions and equipment related problem
- Performed DNA Sequencing and Fragment Analysis by Capillary Electrophoresis.
- Cultured and transformed E. coli
- Expressed recombinant genes in microbial systems
- Extracted and isolated proteins from bacteria, and fungi
- Examined proteins by western blot and enzymatic activity assay
- Assisted with the introduction, array development, and analysis for Array Comparative Genome Hybridization for the laboratory.
- Maintained a clean and efficient laboratory setting (general tidying, autoclaving of biohazardous waste etc), including calibration of instruments such as thermal cyclers

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- Maintaining lab inventories, mediums and chemical stocks for the smooth functionality of the lab.
- Conducted supplemental scientific literature research and presented data at internal progress update meetings.
- Provided technical expertise and served as task lead in support of internal programs
- Performed data generation, collection, documentation, analysis and presentation.
- Identify problems, troubleshoot and take corrective actions to rectify instrumentation/sample issues.
- Supervised and trained 09 graduate and undergraduate students for PCR, PCR-RFLP, RT-PCR, agarose gel electrophoresis.

Education

APRIL 2015
Bachelor of Education (Mathematics & Science) / Sardar Patel University, New Vallabh Vidhyanagar

APRIL 2012
Master of Science (Genetics) / Sardar Patel University, New Vallabh Vidhyanagar

APRIL 2010
Bachelor of Science (Biochemistry & Vocational Biotechnology) / Gujarat University, Ahmedabad

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Activities

UESI Librarian and Secretary: 2012; 2013, 2014, respectively

Dissertation: "Biochemical and Molecular study of mentally disable individuals from selected locations of Gujarat."

Summer training (2008): AMUL, Gujarat, India for a month

Vocational Training (2009-2010): St, Xavier's College, Ahmedabad, Gujarat, India for a year in Plant Tissue Culture where I had acted as a product designer.

Resource Person in Short Course for 10 days (2014, 2015) on Metagenomics: Role of next generation Sequencing.

Publications:

- Sex determination in ratite and non-ratite birds by molecular method (The Indian journal of animal sciences; Published on 2016).

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- Genetic Integrity in Wild Stock of *Babylonia spirata* (Linnaeus, 1758) and Babylonia *zeylanica* (Bruguiere, 1789) from Southeast Coast of India: An important Mariculture Gastropod Species (Indian Journal of Science and Technology; Published on 2016).
- Genetic characterization of horse breeds (*Equus caballus*) of Western India (Indian Journal of Animal Sciences; Accepted on July 2019; Published on March 2020).
- Gene sequence in NCBI: 2

References

Rachna Patel
Medical Lab Assistant
5788 University Avenue
Halifax
Novascotia
+1(902)329-9877
rachna.aaku93@gmail.com

Dr. Nayana H. Patel
Medical Director (M.D. Gynaec. & Obs.)
Akanksha Hospital & Research Institute, Lambhvel-Anand
02692-617306
nayana@ivf-surrogate.com

Mr. Piyush Chudasama
Research Scientist (M. Sc. Biochemistry)
Sat Kaival Hospital Pvt. Ltd., Lambhvel-Anand
0997444791
piyush.chudasama29@gmail.com

Dr. Dharamshi N. Rank
Head & Professor
Department of Genetics & Breeding, Veterinary College & Animal Husbandry, Anand
(02692) 261201
dnrank@gmail.com

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CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY
FACULTY OF MEDICAL SCIENCES
CHAROTAR INSTITUTE OF PARAMEDICAL SCIENCES (A Constituent of CHARUSAT)
DEPARTMENT OF OPTOMETRY

A REPORT ON EDUCATIONAL TRIP AT BLIND PEOPLE ASSOCIATION
6TH MAY, 2018

An educational trip was arranged by department of optometry for third year and second year B.Optometry students. The trip was organized with an aim to give practical exposure of low vision aid and awareness about the activity done by blind people at blind people association, Ahmedabad.

Event was arranged on 6th May 2018 with the aim to nurture the students to develop the skills to handle low vision and total blind patient efficiently.

Optical and Non Optical low vision devices

As a third year students, one should know about the various low vision devices that includes optical and non optical devices. To fulfill these criteria optometrist from the low vision OPD has explained all the instruments and given live demo of the same.

Students were also aware with the various activities performed by the blind person like waiving the clothes, making of handicrafts, operation of mobile devices, usage and application of computer as a blind person, making of chairs, food etc.

Expert from Blind people association explaining the importance of visual acuity in patient of Low vision

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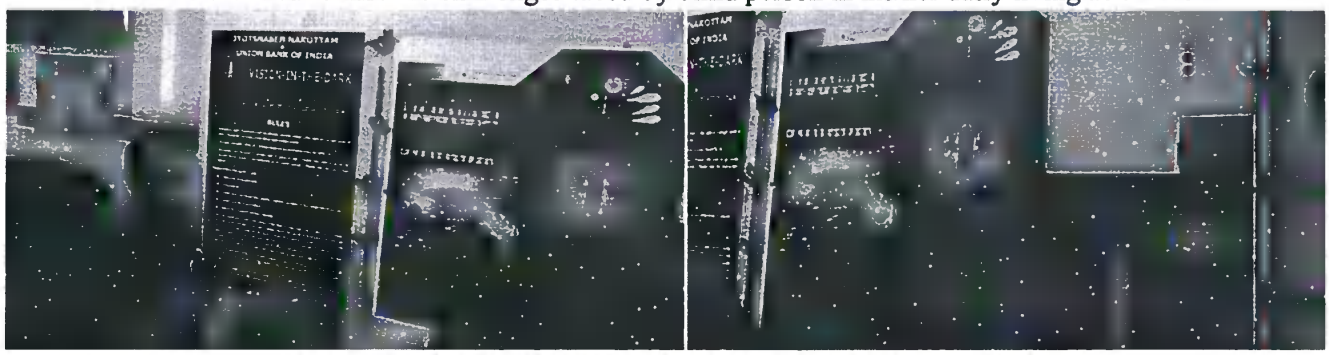
There were total of 15 students from the third year B.optometry and 5 students from second year B.Optometry students and two faculty from optometry department has attended the event and also guide the students accordingly.

Lastly the imagination of blind world has been experienced by all students and faculty. The name of the program was VISION-IN-THE-DARK (A journey into the world of blindness). All were moved by the journey of the dark world and realize the challenges faced by blind person in his/her daily living activities.



Trainer explaining the route of places to be visited an a blind

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CIPS

CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY
FACULTY OF MEDICAL SCIENCES
CHAROTAR INSTITUE OF PARAMEDICAL SCIENCES (A Constituent of CHARUSAT)
DEPARTMENT OF MEDICAL LABORATORY TECHNOLOGY

A Report on Three days workshop on Cell and Molecular Biology At Akanksha Hospital, Anand From 8th-10th March 2018

A workshop was organized by Akanksha Hospital & Research Institute from 8th march 2018 – 10th march 2018 which was attended by students of Department of Medical Laboratory Technology along with two faculty of Charotar Institute of Paramedical Science (CIPS), a constitute of CHARUSAT. The workshop was on "Cell and Molecular Biology" including "Embryology & Molecular Laboratory Techniques" for students to learn and have hands on trainings for the diagnostic techniques. The workshop basically aimed to teach students the basic technical aspects of molecular diagnostics and also how to deal with cell culturing. We were guided by Mr. Piyush Chudasama, molecular biologist and Khyati Patel, research assistant for the same. 10 post graduate Students from Department of MLT participated in the workshop.

Photographs showing series of events during the workshop

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The workshop summary:

1. The three day workshop was planned from 10:00 am - 4:00pmat Akanksha hospital.

2. First day the students were given lecturers on cell and molecular biology where various techniques like PCR and next generation sequencing was explained in detail. Next class was on cell culturing technique where they taught us the different clinical aspects of culturing. Post lunch session included visits to various labs of the diagnostics like sequencing, embryology and culturing.

3. Second day the students were divided in two groups batch1 & 2. Batch 1 were given hands on training for molecular technique DNA Isolation and RT-PCR where they tested tissues for Endometrial Tuberculosis while students of batch 2 were given a demo of cell culturing and monocyte isolation.

4. Last day batches were switched and the same techniques were taught.

5. At the end of workshop students were given certificate for the same signed by Dr. Naina as well as Dr Harsha and Mr. Piyush.

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Artee Tyagi <arteetyagi.cips@charusat.ac.in>

three days workshop at Akanksha Hospital

1 message

dhara patel <dharapatel.cips@charusat.ac.in> Thu, Mar 1, 2018 at 12:21 PM
To: Debayan Baidya <debayanbaidya.bt@charusat.ac.in>, Tithi Patel <tithipatel.cips@charusat.ac.in>, Artee Tyagi <arteetyagi.cips@charusat.ac.in>
Cc: Darshan Patel <darshanpatel.bt@charusat.ac.in>

Dear All,

As directed by the Principal and part of curriculum Mr. Debayan and Ms. Tithi are requested to join students of MSMT to Akanksha hospital from 8th March 2018 to 10th March 2018 for attending 3 days hands on training on **Cell & Molecular Biology.**
Please find the attached copy of the schedule for the workshop here with.

–
Regards

Dr. Dhara N. Patel
Assistant Professor
MLT Department
CIPS
CHARUSAT

workshop details for akanksha hospital msmt.docx
12K

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Dr. REGISTRAR
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Photographs showing series of events during the workshop

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CHAROTAR INSTITUTE OF PRAMEDICAL SCIENCES
DEPARTMENT OF MEDICAL LABORATORY TECHNOLOGY

Three days workshop on Cell and Molecular Biology
At Akanksha Hospital, Anand
From 8th-10th March 2018
ACADEMIC YEAR 2017-2018
MSMLT STUDENTS

Resource Person Detail

Name	Piyush Chudasma
Designation	Molecular Biologist, Research Scientist
Department	Research & Development
Organisation	Sat Kaival Hospitals (pvt) LTD
Phone No.	9974447914

Name	Khyati Patel
Designation	Research Assistant
Department	Research & Development
Organisation	Sat Kaival Hospitals (pvt) LTD

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Contact

www.linkedin.com/in/piyush-chudasama-13383962 (LinkedIn)

Top Skills

Cell biology, Animal tissue culture, Pharmacology
Research
Biotechnology

Languages

English
Learning Spanish
Hindi

Honors-Awards

CSIR UGC NET- LS

Piyush Chudasama

Scientist By Profession and Entrepreneur by Chance....:)
Anand

Summary

I am passionate about science specially for my area, Biochemistry and cell biology. The objectives are developing myself for the science community as much as i can do.

Experience

BPC drafting services (www.bpcdrafting.com)

Assistant Managing Director
September 2016 - Present (4 years 5 months)
Ahmedabad Area, India

Though i do not have any specialization in the architectural field, i am helping as assistant managing director of our own start up. Mostly i am working as public relation officer for the start up. Also utilizing my basic skills of power point, corel draw and other adobe softwares for drawing.

Sat Kaival Hospital Pvt Ltd

Research Scientist
December 2015 - Present (5 years 2 months)
India

Working with world renowned IVF clinic (Dr Nayana Patel's IVF clinic). Holding a Key position in molecular diagnostics division of the company. Experience of more than 100 sequencing run for PGS (preimplanation genetic screening). Other then these, Our team work for developing novel assays for diagnosis, specifically in the field of embryology and gynecology.
Apart from molecular work, also working as in charge of cell biology lab. Culturing and characterization of bone marrow concentrate for research purpose is our primary goal. I am also developing cell based assays for variety of Ayurvedic formulations for Andrology applications.

Charotar University of Science & Technology (CHARUSAT)

9 years 1 month

Research Scholar
January 2012 - Present (9 years 1 month)
Anand, Gujarat

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i am working as Animal tissue culture incharge and routinely involved in experiments like MTT assay, Anti-apoptotic assay, Comet assay, Antioxidant assays. I am also involved in identification and purification of bio active compounds which can be utilized for therapeutic purpose, specially diabetic complications. Other work inculude drug transportation studies using caco 2 as model system.

Project Assistant
January 2014 - January 2016 (2 years 1 month)
Anand

Anand Agricultural University
Research Student
October 2014 - December 2015 (1 year 3 months)
Anand

PERD Centre
Research Scholar
January 2011 - October 2011 (10 months)

I was working in Department of Pharmacology and toxicology. I have learnt handling, dosing of rat and mouse. I have also learnt some of the animal model development like streptozotocin induced diabetes type II, Uninephroctomy model for hypertension, stroke model. Have understood basics of pharmacology for drug development and testing.

Centre for Environment Education
Project assistant
October 2010 - January 2011 (4 months)

I was working as part time project assistant in a project which aimed for environment education and basic learning among school students.

Intas Pharmaceuticals
QC/R & D
May 2010 - December 2010 (8 months)

I was working mostly with HPLC (Agilent technologies). Checking stability of the domestic as well as US-FDA approved drugs was my job description.

St. Xavier's College
Student
2005 - 2008 (3 years)

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Education

Gujarat University

Master's Degree, Biochemistry · (2008 - 2010)

St xavier's collage, Ahmedabad

Bachelor's Degree, Biochemistry/Biotechnology · (2005 - 2008)

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Contact

www.linkedin.com/in/khyati-patel-101533133 (LinkedIn)

Top Skills

Ion torrent Gene Studio S5
Real-Time Polymerase Chain Reaction (qPCR)
Ion torrent PGM

Khyati Patel

Research Associate at Green Cross Genetic Lab
Anand

Summary

Experienced Research Associate with a demonstrated history of working in the Molecular biology, Genetics, Biotechnology field. Skilled in Real-Time Polymerase Chain Reaction (qPCR), RNA Isolation, DNA Extraction,Agarose Gel Electrophoresis, Preimplantation Genetic Screening (PGS). Strong research professional with a Master of Science (M.Sc.) focused in Genetics from Ashok and Rita Patel Institute of Integrated Studies and Research in Biotechnology and Applied Sciences, New Vallabh Vidyanagar.

Experience

Green Cross Genetics Lab
Research Associate
May 2019 - Present (1 year 9 months)
Ahmedabad, Gujarat, India

Sat Kaival Hospital Pvt. Ltd., Unit of Akanksha Hospital and Research Institute, Anand, Gujarat.
Research Assistant
September 2016 - April 2019 (2 years 8 months)
Gujarat, India

Education

Ashok and Rita Patel Institute of Integrated Studies and Research in Biotechnology and Applied Sciences, New Vallabh Vidyanagar
Master of Science (M.Sc.), Genetics

NV Patel College of Pure and Applied Sciences, Vallabh Vidyanagar
Bachelor of Science (BSc), Genetics

Certified By:

Dy. REGISTRAR
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Charotar University of Science and Technology
Charotar Institute of Paramedical Sciences
Board of Studies "Minutes of Meeting"
"Department of Optometry"

Date: 26/02/2018

Time: 1:00PM

Venue: CIPS conference room

The 3rd meeting of board of department of Optometry held on Wednesday 26th February 2018 at 10.00 AM in conference room of Charotar Institute of Paramedical Sciences, CHARUSAT.

Following members were present:

1.	Dr. Darshan H Patel (Principal, CIPS)	Chairperson for the joint meeting of Board of Studies in department of optometry & Faculty of medical sciences, CIPS
2.	Optom.Jyoti Dave singh (Advisor & Adjunct faculty)	Advisor for the joint meeting of Board of Studies in department of optometry & Faculty of medical sciences, CIPS
3.	Optom.Usman Memon (Advisor, Senior Lecturer, Nagar School of Optometry)	Advisor for the joint meeting of Board of Studies in department of optometry & Faculty of medical sciences, CIPS
4.	Optom.Jaydevsinh Pargara (Faculty, CIPS)	HoD for the joint meeting of Board of Studies in department of optometry & Faculty of medical sciences, CIPS
5.	Optom.Yogesh Vaghela (Faculty, CIPS)	Faculty for the joint meeting of Board of Studies in department of optometry & Faculty of medical sciences, CIPS

Agenda of the meeting

Item No. 3.1 To approve minutes of 2nd BOS meeting held on 29th March 2017

Item No. 3.2 To approve proposals of the new course for Sem IV & V

Item No. 3.3 Any other item with the permission of chairperson

Certified By:

Dr. REGISTRAR
CHAROTAR UNIVERSITY OF
SCIENCE & TECHNOLOGY
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Details of the discussion

The chairperson for the joint meeting welcomed all the members and invites to the meeting. The meeting proceeded with the agenda.

Item No. 3.1 To approve minutes of 2nd BOS meeting held on 29th March 2017

- Second BoS minutes were approved and the revised teaching curriculum for Sem 1 was presented (attached in Annexure 1 old & Annexure 2 New).
- All BoS members agreed and approved the revised teaching scheme for sem 1.

Item No. 3.2 To approve proposals of the new course for Sem IV & V

- All the board members were agreed to follow the curriculum guidelines provided by MOHFW.
- BoS members agreed with the teaching curriculum of semester IV and V involving both the core course from the MoHFW guidelines and elective courses from the University. (attached in Annexure 4 & Annexure 5)
- Mr. Usman Memon suggested two changes in guideline provided by MOHFW
  - To combine Binocular Single Vision-I and pediatric Optometry as single subject in 5th semester
  - To combine Low vision and geriatric Optometry as a single subject in 5th semester
  - The above suggestions are incorporated in the teaching scheme (attached Annexure)

Item No. 3.3 Any other item with the permission of chairperson

- To incorporate new optometric instruments to give more practical exposure to the students.

Optom. Jaydevsinh Paragara
Head of Optometry Dept.
CIPS, CHARUSAT

INSTITUTE OF PARAMEDICAL SCIENCES CHARUSAT CAMPUS CHANGA

Dr. Darshan Patel
Principal
CIPS, CHARUSAT

Certified By:

REGISTRAR
CHAROTAR UNIVERSITY OF SCIENCE & TECHNOLOGY
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ANNEXURE 1

CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY

CHAROTAR INSTITUTE OF PARAMEDICAL SCIENCES
BACHELOR OF SCIENCE IN OPTOMETRY
PRESENT TEACHING SCHEME

Degree : BOP
Total Subjects : 7
Total Regular Subjects : 6
Total Elective Subjects : 1
Semester : 1

Group Name : Regular

Course Code	Course Title	Teaching Scheme					Examination Scheme						
		CREDIT				TOTAL HOURS	TH		PR		PRJ		TOTAL
		TH	PR	PRJ	TOTAL		Internal	External	Internal	External	Internal	External	
BOP101	GENERAL ANATOMY	4.00	2.00		6.00	6.00	0/30	28/70	0/30	28/70	-	-	200
BOP102	GENERAL PHYSIOLOGY	4.00	2.00		6.00	6.00	0/30	28/70	0/30	28/70	-	-	200
BOP103	GENERAL BIOCHEMISTRY	2.00	2.00		4.00	4.00	0/30	28/70	0/30	28/70	-	-	200
BOP104	GEOMETRICAL OPTICS-I	4.00	2.00		6.00	6.00	0/30	28/70	0/30	28/70	-	-	200
BOP105	NUTRITION	2.00			2.00	2.00	0/15	14/35	-	-	-	-	50
BOP106	BASIC OF COMPUTERS	2.00			2.00	2.00	0/15	14/35	-	-	-	-	50
					26.00	26.00							900

Group Name : ELECTIVE-1

Course Code	Course Title	Teaching Scheme					Examination Scheme						
		CREDIT				TOTAL HOURS	TH		PR		PRJ		TOTAL
		TH	PR	PRJ	TOTAL		Internal	External	Internal	External	Internal	External	
HS101.01 H	LIBERAL ARTS - PAINTING		2.00		2.00	2.00	-	-	0/30	28/70	-	-	100
HS102.01 H	LIBERAL ARTS - PHOTOGRAPHY		2.00		2.00	2.00	-	-	0/30	28/70	-	-	100
HS103.01 H	LIBERAL ARTS - SCULPTING		2.00		2.00	2.00	-	-	0/30	28/70	-	-	100
HS104.01 H	LIBERAL ARTS - POTTERY AND CERAMIC ART		2.00		2.00	2.00	-	-	0/30	28/70	-	-	100
HS105.01 H	LIBERAL ARTS - MEDIA AND GRAPHIC DESIGN		2.00		2.00	2.00	-	-	0/30	28/70	-	-	100
HS106.01 H	LIBERAL ARTS - ART AND CRAFT		2.00		2.00	2.00	-	-	0/30	28/70	-	-	100
HS107.01 H	LIBERAL ARTS - FASHION DESIGNING		2.00		2.00	2.00	-	-	0/30	28/70	-	-	100
HS108.01 H	LIBERAL ARTS - INTERIOR DESIGNING		2.00		2.00	2.00	-	-	0/30	28/70	-	-	100
HS109.01 H	LIBERAL ARTS - DRAMATICS		2.00		2.00	2.00	-	-	0/30	28/70	-	-	100
HS110.01 H	LIBERAL ARTS - CONTEMPORARY DANCE		2.00		2.00	2.00	-	-	0/30	28/70	-	-	100
HS132 H	ACADEMIC ENGLISH		2.00		2.00	2.00	-	-	0/30	28/70	-	-	100

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CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY

Date : 20/01/2021

CHAROTAR INSTITUTE OF PARAMEDICAL SCIENCES
BACHELOR OF SCIENCE IN OPTOMETRY

Syllabus Details

Effective Year 2017-18

Degree : BOP
Total Subjects : 7
Total Regular Subjects : 6
Total Elective Subjects : 1

Semester : 1

Total Credit for Regular Subjects	:	26.00
Total Credit for Elective Subjects	:	2.00
Total Credit	:	28.00

Examination Grade Range & Value

Grade	Grade Points	From Marks	To Marks
AA	10.00	80	100
AB	9.00	75	79
BB	8.00	70	74
BC	7.00	65	69
CC	6.00	60	64
CD	5.00	55	59
DD	4.00	50	54
FF	0.00	0	49

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CHARUSAT CAMPUS CHANGA

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ANNEXURE 2

CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY

CHAROTAR INSTITUTE OF PARAMEDICAL SCIENCES
BACHELOR OF SCIENCE IN OPTOMETRY

REVISED TEACHING SCHEME

Effective Year 2018-19

Degree : BOP
Total Subjects : 8
Total Regular Subjects : 7
Total Elective Subjects : 1
Semester : 1

Group Name : Regular

Course Code	Course Title	Teaching Scheme					Examination Scheme						
		CREDIT				TOTAL HOURS	TH		PR		PRJ		TOTAL
		TH	PR	PRJ	TOTAL		Internal	External	Internal	External	Internal	External	
BOP101.01	GENERAL ANATOMY	4.00			4.00	60.00	0/30	28/70	-	-	-	-	100
BOP102.01	GENERAL PHYSIOLOGY	4.00			4.00	60.00	0/30	28/70	-	-	-	-	100
BOP103.01	GENERAL BIOCHEMISTRY	2.00			2.00	30.00	0/15	14/35	-	-	-	-	50
BOP104.01	GEOMETRICAL OPTICS-I	4.00			4.00	60.00	0/30	28/70	-	-	-	-	100
BOP105.01	NUTRITION	2.00			2.00	30.00	0/15	14/35	-	-	-	-	50
BOP107	LABORATORY & PRACTICAL		6.00		6.00	12.00	-	-	0/60	56/140	-	-	200
BOP108.01	BASICS OF COMPUTER	2.00			2.00	30.00	0/15	14/35	-	-	-	-	50
					24.00	282.00							650

Group Name : ELECTIVE-1

Course Code	Course Title	Teaching Scheme					Examination Scheme						
		CREDIT				TOTAL HOURS	TH		PR		PRJ		TOTAL
		TH	PR	PRJ	TOTAL		Internal	External	Internal	External	Internal	External	
HS101.01 H	LIBERAL ARTS - PAINTING		2.00		2.00	2.00	-	-	0/30	28/70	-	-	100
HS102.01 H	LIBERAL ARTS - PHOTOGRAPHY		2.00		2.00	2.00	-	-	0/30	28/70	-	-	100
HS105.01 H	LIBERAL ARTS - MEDIA AND GRAPHIC DESIGN		2.00		2.00	2.00	-	-	0/30	28/70	-	-	100
HS109.01 H	LIBERAL ARTS - DRAMATICS		2.00		2.00	2.00	-	-	0/30	28/70	-	-	100
HS110.01 H	LIBERAL ARTS - CONTEMPORARY DANCE		2.00		2.00	2.00	-	-	0/30	28/70	-	-	100

Total Credit for Regular Subjects	:	24.00
Total Credit for Elective Subjects	:	2.00
Total Credit	:	26.00

Certified By:

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CHANGA - 388421, TA. PETLAD, DI. ANAND

Date : 20/01/2021

CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY

CHAROTAR INSTITUTE OF PARAMEDICAL SCIENCES
BACHELOR OF SCIENCE IN OPTOMETRY

Syllabus Details

Effective Year 2018-19

Semester : 1

Degree : BOP
Total Subjects : 8
Total Regular Subjects : 7
Total Elective Subjects : 1

Examination Grade Range & Value

Grade	Grade Points	From Marks	To Marks
AA	10.00	80	100
AB	9.00	75	79
BB	8.00	70	74
BC	7.00	65	69
CC	6.00	60	64
CD	5.00	55	59
DD	4.00	50	54
FF	0.00	0	49

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ANNEXURE 3

CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY
CHAROTAR INSTITUTE OF PARAMEDICAL SCIENCES
BACHELOR OF OPTOMETRY

4th Semester

Course Code	Course Title	Teaching Scheme					Examination Scheme						
		CREDIT				TOTAL HOURS	TH		PR		PRJ		TOTAL
		TH	PR	PRJ	TOTAL		Internal	External	Internal	External	Internal	External	
BOP401	Optometric optics – II & Dispensing Optics	3	-	-	3.00	45	0/30	28/70	-	-	-	-	100
BOP402	Visual Optics-II	3	-	-	3.00	45	0/30	28/70	-	-	-	-	100
BOP403	Ocular Disease	4	-	-	4.00	60	0/30	28/70	-	-	-	-	100
BOP404	Pathology	2	-	-	2.00	30	0/15	14/35	-	-	-	-	50
BOP405	Basic and Ocular Pharmacology	3	-	-	3.00	45	0/30	28/70	-	-	-	-	100
BOP406	Clinical Optometry-III	-	12	-	6.00	-	-	-	0/60	56/140	-	-	200
HS133H	Creativity, Problem Solving And Innovation	-	2	-	2.00	-	-	-	0/30	28/70	-	-	100
Total		15	14	-	23	225	-	-	-	-			750

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ANNEXURE 4
CHAROTAR UNIVERSITY OF SCIENCE AND TECHNOLOGY
CHAROTAR INSTITUTE OF PARAMEDICAL SCIENCES
BACHELOR OF OPTOMETRY
5th Semester

Course Code	Course Title	Teaching Scheme					Examination Scheme						
		CREDIT				TOTAL HOURS	TH		PR		PRJ		TOTAL
		TH	PR	PRJ	TOTAL		Internal	External	Internal	External	Internal	External	
BOP601	CONTACT LENS-I	3.0			3.00	3.00	0/30	28/70	-	-	-	-	100
BOP602	LOW VISION AID AND GERIATRIC OPTOMETRY	3.0			3.00	3.00	0/30	28/70	-	-	-	-	100
BOP603	BINOCULAR SINGLE VISION-I & PEDIATRIC OPTOMETRY-I	4.0			4.00	3.00	0/30	28/70	-	-	-	-	100
BOP604	SYSTEMIC DISEASE	3.0			3.00	3.00	0/30	28/70	-	-	-	-	100
BOP606	CLINICAL OPTOMETRY-IV		6.00		6.00	12.00	-	-	0/60	56/140	-	-	200
HS124.01	PROFESSIONAL COMMUNICATION		2.00		2.00	2.00	-	-	0/30	28/70	-	-	100
Total					21.00	26.00							700

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CHARUSAT CAMPUS CHANGA

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