*Issue 6, Published: March 2019*

# NEWS LETTER

Winning entry ‘Agar Art’

## Department of Microbiology

## Dr. Ram Manohar Lohia Institute of Medical Sciences
## Lucknow

## Department of Microbiology

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**Mycobacteriology & Immunology Incharge**

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**Prof. Deepak Malviya**
**DIRECTOR**

Date : 13/02/2019

## Director's Message

I am immensely happy to know that our Department of Microbiology, Dr Ram Manohar Lohia Institute of Medical Sciences is organizing a CME on the theme "Beyond Antibiotics" on 2nd March 2019 & also releasing their 6th Annual News Letter of the Department of Microbiology for the year 2018.

A very relevant topic being taken up this time again by the Department of Microbiology, when Anti-Microbial Resistance (AMR) have been recognized as a global threat. It is we, whose misuse of antibiotics has led to a situation when we need to think of "What's there Beyond Antibiotics?" Because on one side we have a grave situation in which smallest or otherwise insignificant of infections may become untreatable life threatening due to the ever rising AMR of existing antimicrobials, on the other hand newer antibiotics if being developed, microbes develop resistance, much sooner than the time they require to be in the use for critically ill patients. This is because the tiny microbes are smarter than we are, and since millions of years, before we were, they are continuing to exist in this earth, and may do so millions of years after we are gone.

So, this is the time we give a serious thought to the rising menace of antimicrobial resistance. I am sure the CME on the theme "Beyond Antibiotics" organized by the department of Microbiology will serve a food for thought to sensitize the Microbiologists & Clinicians attending.

Annual 6th edition of microbiology newsletter of the Department of Microbiology is released today, which always serves as a handy tool to our clinicians, with the local antimicrobial data of the institute.

I congratulate all the Faculty members & staff of the Department of Microbiology for organizing a CME on such an important theme and bring out their annual newsletter.

**(Prof. Deepak Malviya )**
Director
Dr. Ram Manohar Lohia
Institute of Medical Sciences

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**Dr. Chandra Kant Pandey**
**Chief Medical Superintendent**

**Date:** 20/02/2019

## Chief Medical Superintendant's Message

It gives me immense pleasure to know that the Department of Microbiology, Dr Ram Manohar Lohia Institute of Medical Sciences, Lucknow is organizing a CME **on "Beyond Antibiotics"** & releasing their **6th Annual Microbiology News Letter** for the year 2018 on 2nd March 2019.

The theme of the CME is relevant in the era of Multi Drug Resistance infections in health care settings, especially ICUs, this has seriously compromised the armamentarium of antibiotics available with us, thereby we have to seriously consider the possibility of an era of **'Beyond Antibiotics'**.

I extend my best wishes to the Faculty members, Residents & Staff of the Department of Microbiology for organizing the CME & Inauguration of their annual News Letter.

(Dr. Chandra Kant Pandey)
Dr. C. K. Pandey
Chief Medical Superintendent
Dr. R.M.L.I.M.S., Gomti Nagar
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Dr. Subrat Chandra
(M.D.)
Medical Superintendent

## Medical Superintendent's Message

I am glad that the Department of Microbiology, Dr Ram Manohar Lohia Institute of Medical Sciences, Lucknow is organizing a CME on a very pertinent topic "Beyond Antibiotics" & also releasing their 6th Annual Microbiology News Letter for the year 2018 on this occasion on 2nd March 2019.

The theme of the CME is what the society needs to think seriously, because we are being threatened by the ever rising emergence of antimicrobial resistance ( AMR), which may make simple infections incurable & life threatening. Discussion in the CME on this important topic and annual antibiogram data in their newsletter will aid in facilitating our institute's patient care services which has already made a mark in field of health care in Uttar Pradesh & the Country.

I congratulate the Faculty members, Residents & Staff of the Department of Microbiology for organizing the CME & Inauguration of the News Letter.

(Medical Superintendent)

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*Office of Dean*
**Prof Mukul Misra**
**DM (Cardiology)**
**E-mail: deanrmlims@gmail.com**

## Dean's Message

I am happy to note that the Department of Microbiology, Dr. Ram Manohar Lohia Institute of Medical Sciences, Lucknow is organizing a CME on a very pertinent topic "Beyond Antibiotics" & also releasing their 6th Annual News Letter of the Department Microbiology for the year 2018 on this occasion on 2nd March 2019.

These CME's on the relevant burning topics in healthcare helps sensitizing the Faculty members as well as the students of the Institute, which provides the Medical Under-graduate, Post-graduate & Super-specialty teaching under the same umbrella similar to AIIMS, New Delhi.

I congratulate & extend my warm regards to the Faculty members, Residents & Staff of the Department of Microbiology for organizing the CME & the release of their 6th Annual Microbiology News Letter.

**(Mukul Misra)**
Prof. Mukul Misra
Dean
Dr. RMLIMS, Lucknow

## From Editors Desk

It's with much pride and joy that I present this news letter; having joined here as Head of the Department in November 2017, It literally marks my one year of journey too!!

The news letter contains annual Antibiograms for antibiotics and antifungals, based on data collected from January through December 2018. We have also compiled laboratory data for tuberculosis, virology and serology etc; and some interesting case reports and other relevant data. In the year gone by, we have brought about a lot of changes and development in the department, and we hope to continue to keep doing that with each passing year. Patient care wise, I think the big change that we could make possible was incorporating the '*clinical diagnosis/antibiotics taken*' box in Hospital Information System, for all bacterial/fungal culture and sensitivity. Apart from other things like new diagnostic tests, new staff, new residents joining the department; we also welcomed our first MBBS batch, and all the faculty have taken to undergraduate teaching with gusto. We have been able to release Institute's '*Hand Hygiene Policy'* thanks to efforts by Dr. Manodeep Sen. All the laboratories have printed SOPs now. We have EQAS in place, and are lyophilizing important bacterial isolates. The antibiotic sensitivity data is being entered in SPSS software on daily basis since last one year, hence making antibiograms was so much easier this time round. We also organised a workshop *"Catheter Related Blood Stream Infection: Risk factors and Prevention"* in September 2018, which lead us to finalizing 'Do's and Don'ts' for prevention of hospital associated infections and putting them up in various ICUs.

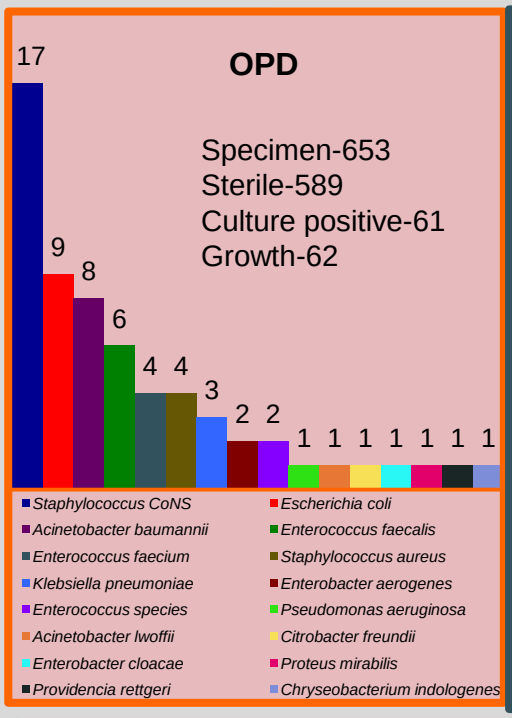
The release of this year's news letter, would take place with a CME as was done last year; theme for which is: ***'Beyond Antibiotics'***. With so much of antibiotic resistance and so few newer antibiotics, "is it time to look beyond antibiotics, at other available options and future prospects?" This will be discussed in the guest lecture by none other than Professor Pallab Ray, from Department of Microbiology, PGIMER Chandigarh; a name to reckon with, in Clinical Microbiology. It will be followed by a quiz and panel discussion on MDR bacteria.

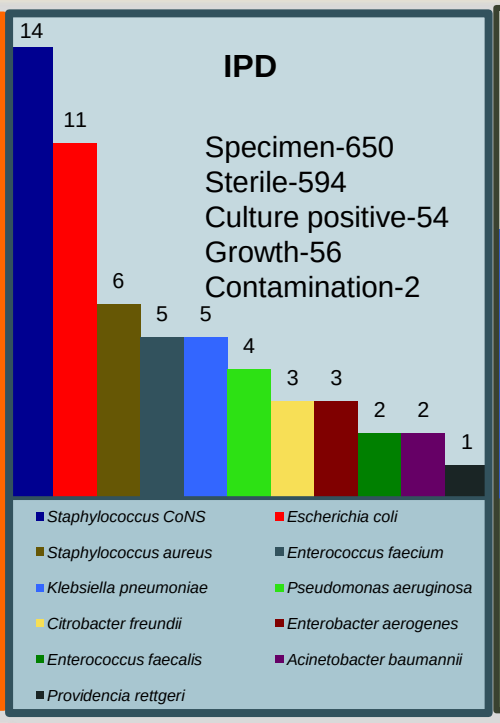
At the end, I wish to convey my heartfelt thanks to all my colleagues and residents; technical, clerical and other staff; it's because of their hard work and dedication that we are seeing this steady progress. Special thanks to Dr. Shruti for helping prepare antibiograms; and my team of subeditors for putting together this news letter.

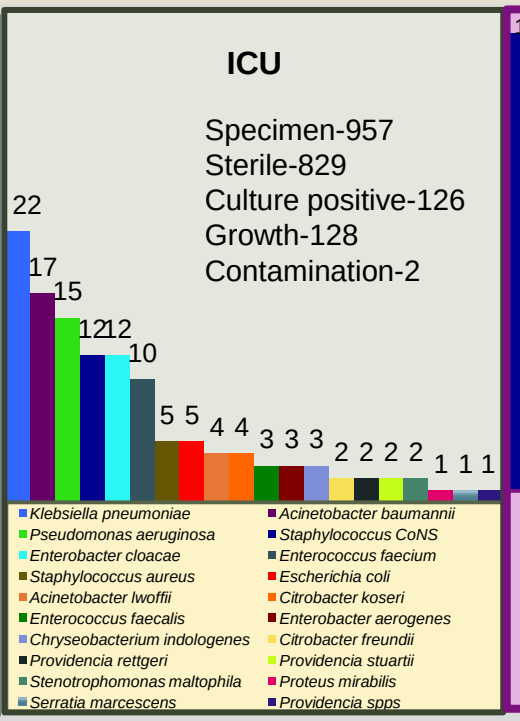
**Dr. Jyotsna Agarwal**
**Professor & Head**

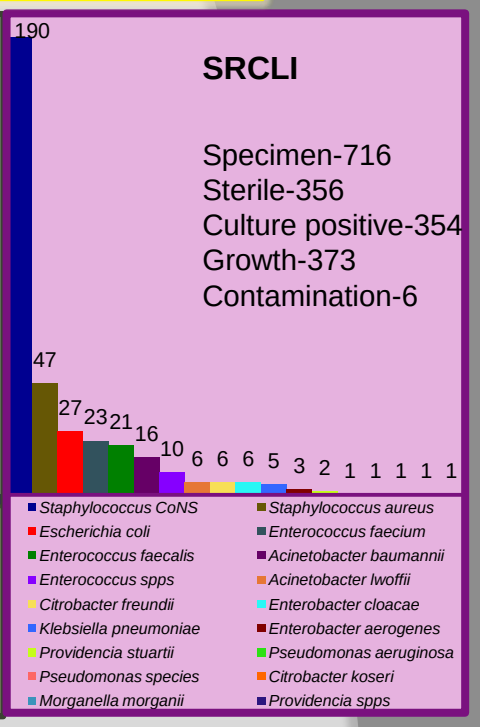
# Blood (January-December 2018)

Total sample received= 3214; Samples analyzed*= 2976; 24 samples showed polymicrobial growth




## Percentage sensitivity

OPD | ICU
IPD | SRCLI

| | Number | CX | CD | GENTA | NETIL | AMIKA | CFS | PENI | E | CIPRO | DOX | TET | TEICO | LZ | CHLOR | LEVO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *S. aureus* | 47 | 59 | 68 | 47 | 87 | 72 | 63 | 2.5 | 28 | 14 | 72 | 57 | 76 | 98 | 76 | 50 |
| *CoNS* | 190 | 30 | 76 | 41 | 85 | 73 | 67 | 11 | 24 | 30 | 77 | 62 | 87 | 96 | 79 | 57 |

| | Number | PENI | E | CIPRO | DOX | TET | TEICO | VA | LZ | CHLOR | LEVO | HLG |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Enterococcus spps* | 54 | 34 | 27 | 35 | 70 | 65 | 72 | 87 | 94 | 80 | 50 | 57 |

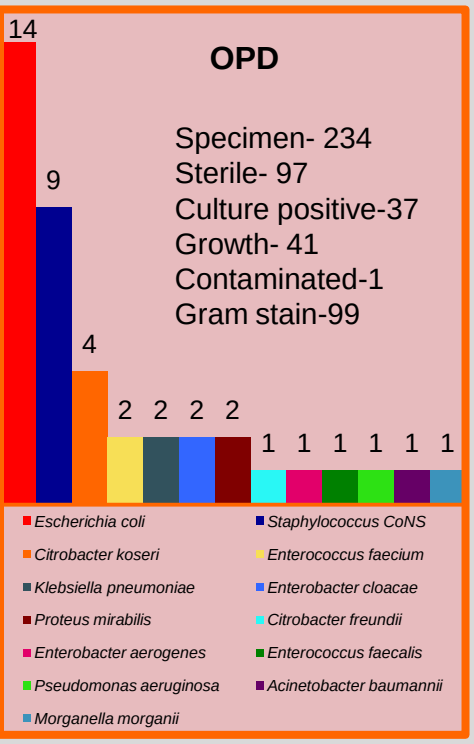
| | Number | AS | AT | TET | DOX | PIT | CIPRO | GENTA | MERO | IMI | TOB | CPM | CFS | LEVO | AMIKA | CTX | CZ | CX | ETP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lactose fermenters | 54 | 4 | 7 | 51 | 31 | 10 | 6 | 15 | 19 | 21 | 6 | 9 | 13 | 9 | 11 | 41 | 57 | 6 | 16 |
| | 52 | 22 | 13 | 69 | 67 | 37 | 28 | 37 | 31 | 39 | 33 | 19 | 26 | 39 | 40 | 14 | 100 | 19 | 18 |

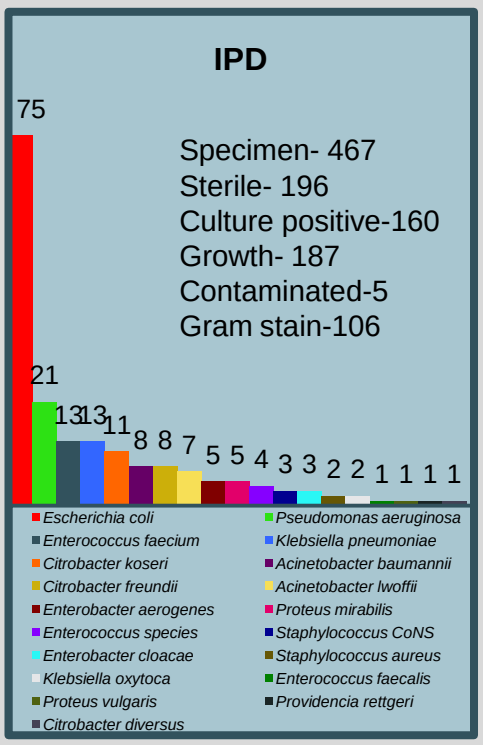
| | Number | AS | CAZ | DORI | NETIL | PB | TET | DOX | PIT | CIPRO | GENTA | MERO | IMI | TOB | CPM | CFS | LEVO | AMIKA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Non-Lactose fermenters | 36 | 5 | 18 | 46 | 14 | 93 | 24 | 43 | 19 | 9 | 18 | 6 | 11 | 9 | 3 | 15 | 29 | 17 |

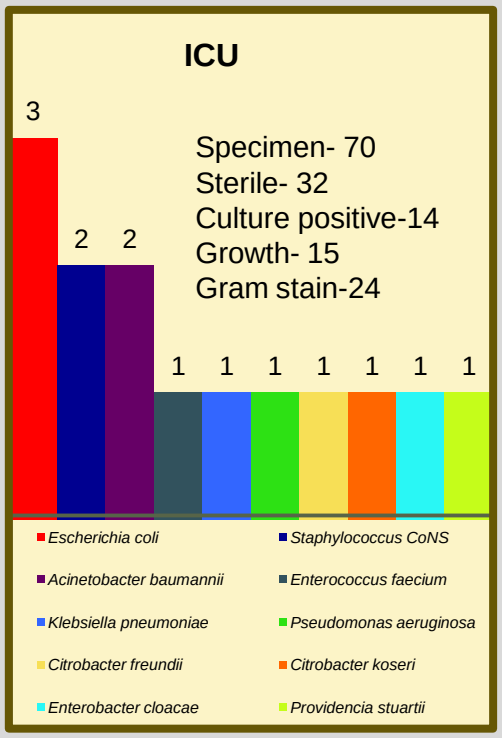
**Number of Samples analyzed are lesser than the samples received , since some of the samples for which clinical details were missing, have been excluded from antibiogram analysis*

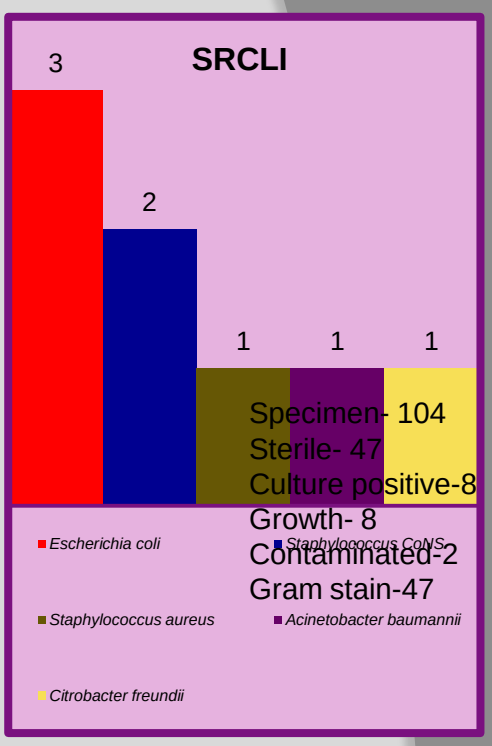
# *Body fluids (January-December 2018)

Total sample received= 1045; Sample analyzed*= 875; 32 samples showed polymicrobial growth




## Percentage sensitivity

OPD | ICU
IPD | SRCLI

| | Number | AS | AT | TET | DOX | PIT | CIPRO | GENTA | MERO | IMI | TOB | CPM | CFS | LEVO | AMIKA | CTX | CZ | CX | ETP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lactose fermenters | 27 | 13 | 23 | 43 | 52 | 37 | 22 | 39 | 50 | 48 | 32 | 28 | 38 | 30 | 53 | 14 | 5 | 10 | 36 |
| | 125 | 14 | 9 | 33 | 32 | 27 | 17 | 54 | 57 | 59 | 39 | 15 | 24 | 24 | 56 | 7 | 0 | 19 | 26 |

| | Number | AS | CAZ | DORI | NETIL | PB | OFLOX | AT | TET | DOX | PT | CIPRO | GENTA | MRM | IMP | TOB | CPM | CFS | LEVO | AMIKA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Non-Lactose fermenters | 36 | 21 | 31 | 58 | 56 | 83 | 30 | 43 | 29 | 41 | 49 | 38 | 69 | 50 | 53 | 56 | 40 | 47 | 46 | 55 |

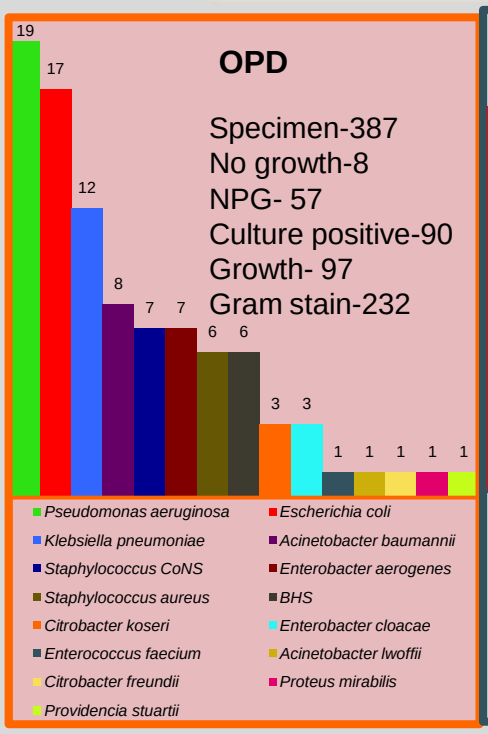
*Sterile body fluids including CSF

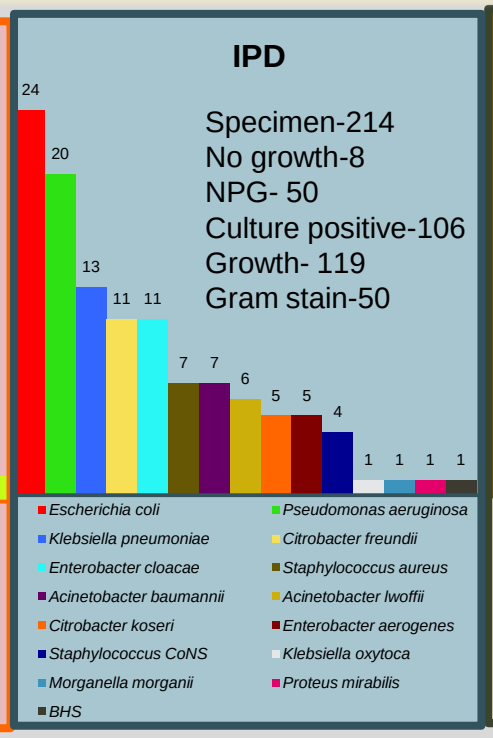
For statistically significant antibiograms, as per recommendations by CLSI, antibiotic susceptibility profile of **atleast 30 organisms** should be available. Thus we have clubbed some bacteria in groups in order to get sufficient numbers

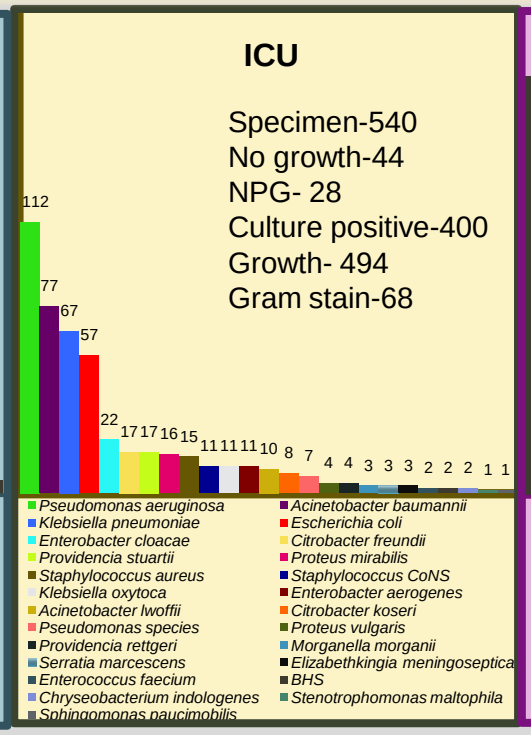
| | | | |
|---|---|---|---|
| IPD | In-Patient Department | OPD | Out-Patient Department |
| ICU | Intensive Care Unit | SRCLI | State Referral Centre for Laboratory Investigation |

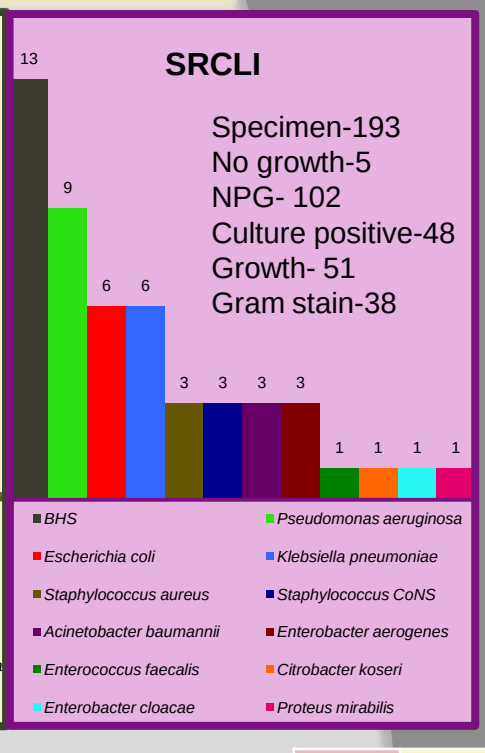
# *Respiratory specimen (January-December 2018)

Total sample received= 1502; Sample analyzed*=1334, 117 samples showed polymicrobial growth




## Percentage sensitivity

OPD | ICU
IPD | SRCLI

| | Number | AS | AT | TET | DOX | PIT | CIPRO | GENTA | MERO | IMI | TOB | CPM | CFS | LEVO | AMIKA | CTX | CZ | CX | ETP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lactose fermenters | 45 | 5 | 6 | 30 | 29 | 40 | 18 | 34 | 58 | 50 | 27 | 16 | 31 | 40 | 38 | 41 | 6 | 35 | 36 |
| | 72 | 10 | 8 | 24 | 20 | 26 | 21 | 36 | 44 | 53 | 16 | 16 | 26 | 19 | 39 | 32 | 3 | 19 | 32 |
| | 237 | 4 | 6 | 24 | 22 | 15 | 5 | 16 | 28 | 22 | 8 | 6 | 9 | 9 | 20 | 3 | 3 | 7 | 17 |

| | Number | AS | CAZ | DORI | NETIL | PB | OFLOX | AT | TET | DOX | PT | CIPRO | GENTA | MRM | IMP | TOB | CPM | CFS | LEVO | AMIKA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Non-Lactose fermenters | 35 | 0 | 50 | 50 | 40 | 71 | 54 | 70 | 11 | 11 | 47 | 39 | 46 | 34 | 46 | 49 | 42 | 48 | 39 | 49 |
| | 206 | 0 | 9 | 14 | 5 | 65 | 7 | 9 | 5 | 9 | 11 | 7 | 9 | 7 | 8 | 7 | 7 | 16 | 9 | 8 |

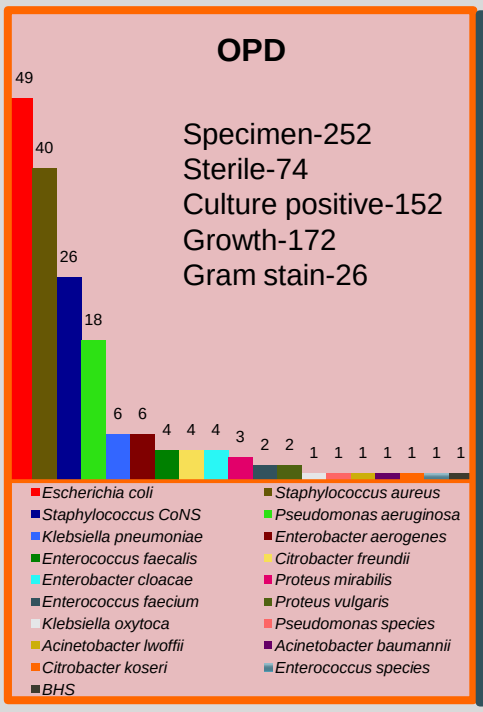
*Sputum, BAL, Throat swab, Nasal swab, Bronchial aspirate, Endotracheal aspirate

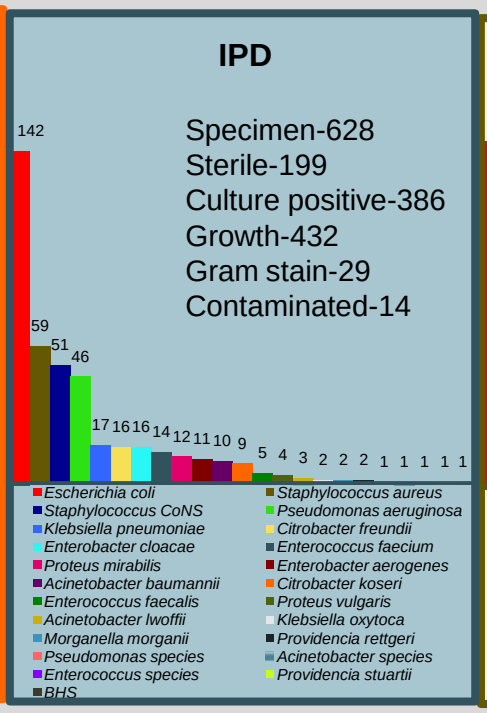
| | |
|---|---|
| Contamination | Growth of skin flora: diphtheroids, spore forming bacilli |
| NPG | No Pathogenic growth |
| NSG | Non-significant growth |

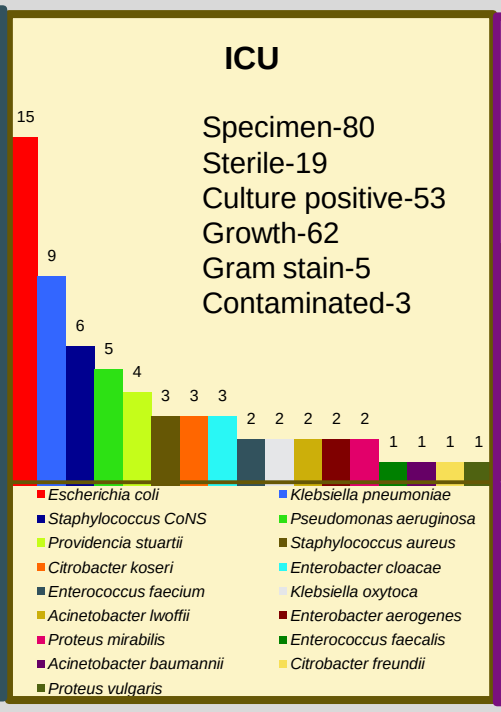
| | |
|---|---|
| Lactose fermenters | *Escherichia coli, Citrobacter* spps, *Klebsiella* spps, *Proteus* spps, , *Providencia* spps |
| Non lactose fermenters | *Pseudomonas* spps, *Acinetobacter* spps, |
| Staphylococcus spps | *Staphylococcus aureus*, Coagulase Negative *Staphylococcus* spps (CoNS) |

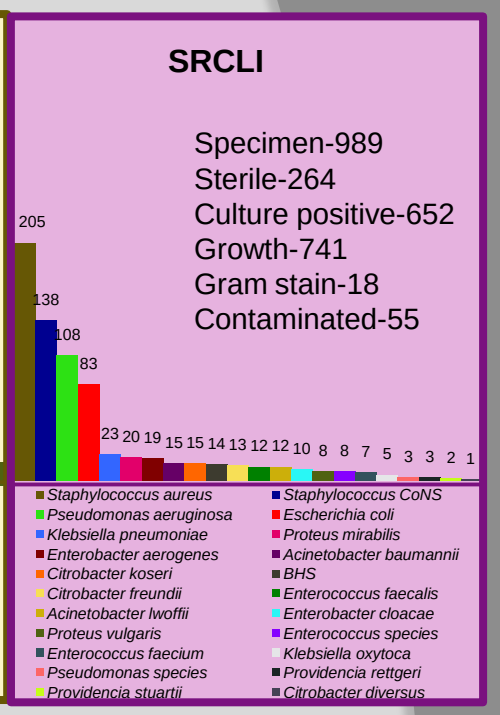
# *Pus and other samples (January-December 2018)

Total sample received= 2213; Total samples analyzed= 1949 ; 156 samples showed polymicrobial growth




OPD | ICU
IPD | SRCLI

## Percentage sensitivity

| | Number | CX | CD | GENTA | NETIL | AMIKA | CFS | PENI | E | CIPRO | DOX | TET | TEICO | LZ | CHLOR | LEVO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Staphylococcus spps* | 66 | 48 | 52 | 44 | 83 | 60 | 55 | 9 | 29 | 9 | 80 | 60 | 78 | 94 | 71 | 38 |
| | 110 | 39 | 68 | 37 | 77 | 67 | 54 | 7 | 26 | 12 | 74 | 63 | 86 | 90 | 80 | 42 |
| | 343 | 37 | 76 | 44 | 45 | 76 | 59 | 12 | 29 | 13 | 71 | 58 | 85 | 96 | 75 | 40 |

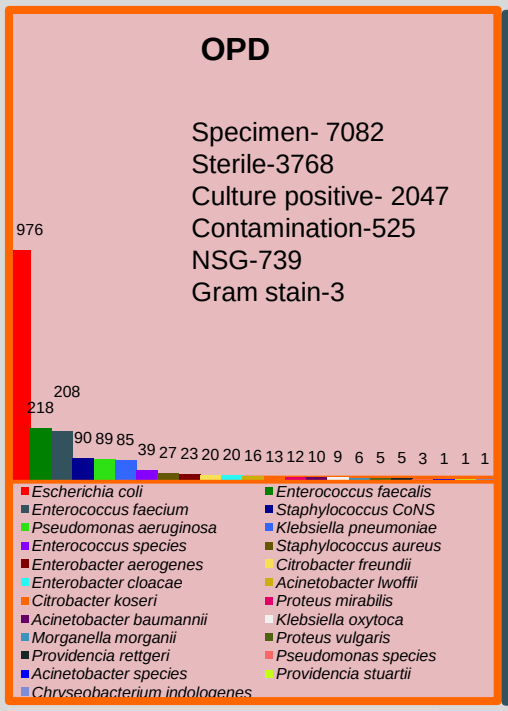
| | Number | AS | AT | TET | DOX | PIT | CIPRO | GENTA | MERO | IMI | TOB | CPM | CFS | LEVO | AMIKA | CTX | CZ | CX | ETP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lactose fermenters | 76 | 17 | 15 | 30 | 30 | 38 | 19 | 36 | 49 | 51 | 22 | 18 | 31 | 23 | 42 | 11 | 6 | 30 | 39 |
| | 234 | 16 | 9 | 32 | 26 | 34 | 15 | 45 | 52 | 52 | 33 | 16 | 32 | 22 | 49 | 3 | 5 | 20 | 42 |
| | 42 | 21 | 6 | 29 | 24 | 27 | 10 | 29 | 29 | 31 | 10 | 29 | 17 | 13 | 26 | 8 | 14 | 15 | 18 |
| | 202 | 29 | 24 | 45 | 37 | 60 | 29 | 51 | 66 | 65 | 36 | 35 | 48 | 45 | 57 | 19 | 20 | 38 | 52 |

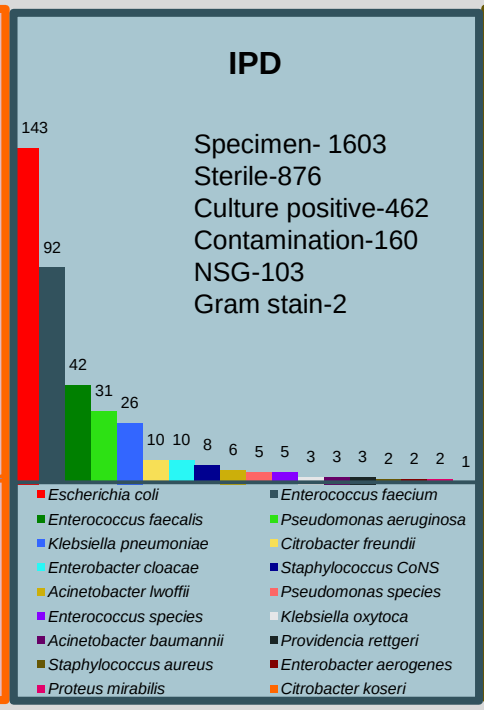
| | Number | AS | CAZ | DORI | NETIL | PB | OFLOX | AT | TET | DOX | PIT | CIPRO | GENTA | MERO | IMI | TOB | CPM | CFS | LEVO | AMIKA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Non-Lactose fermenters | 61 | 0 | 48 | 56 | 48 | 91 | 42 | 54 | 20 | 33 | 54 | 37 | 51 | 53 | 63 | 53 | 43 | 47 | 43 | 54 |
| | 138 | 21 | 69 | 70 | 53 | 96 | 47 | 61 | 37 | 63 | 78 | 54 | 59 | 65 | 76 | 57 | 59 | 67 | 55 | 59 |

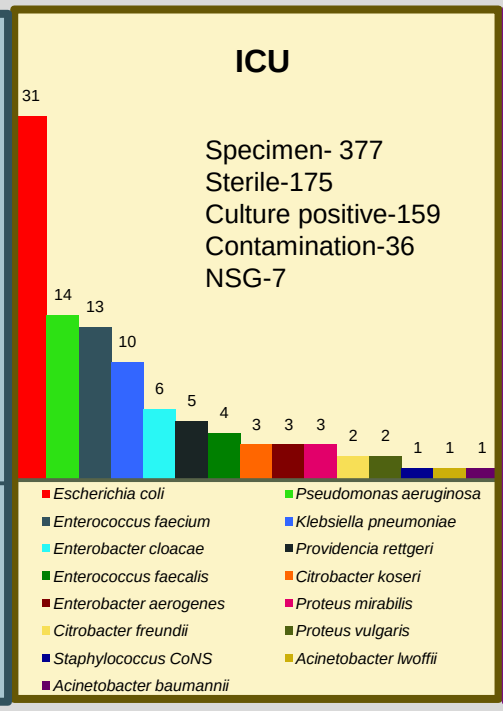
*Pus, Pus swab, Catheter tip, CVP line, Shunt, Tissue, Bone marrow, Vaginal fluid, Semen, Ear discharge, Ear swab, Endometrial discharge, Vaginal swab, Stool, Urethral swab

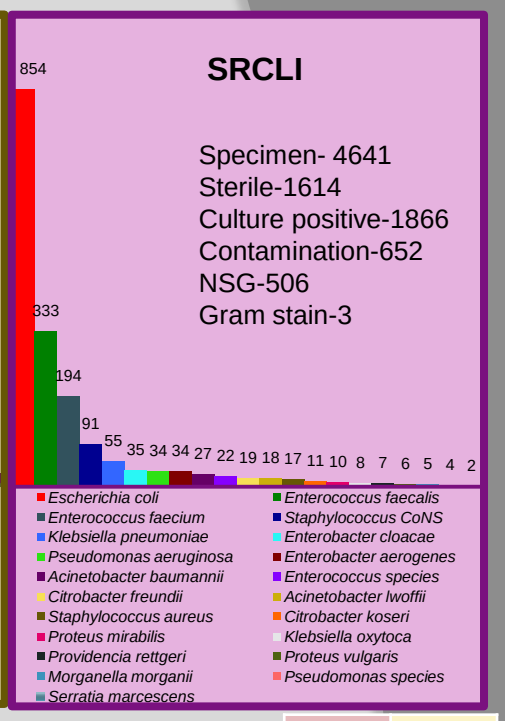
# Urine (January-December 2018)

Total sample received=14374; Samples analyzed = 13703




## Percentage sensitivity

OPD | ICU
IPD | SRCLI

| | Number | CX | GENTA | NETIL | AMIKA | OFLOX | CFS | PENI | NX | DOX | TET | TEICO | NF | LZ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Staphylococcus spps.* | 117 | 24 | 23 | 85 | 63 | 4 | 39 | 7 | 5 | 60 | 54 | 68 | 80 | 93 |
| | 108 | 26 | 33 | 86 | 77 | 18 | 44 | 12 | 12 | 53 | 43 | 72 | 77 | 82 |

| | Number | PENI | CIPRO | NX | DOX | TET | TEICO | NF | VA | LZ | LEVO | HLG | FOS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Enterococcus faecium* | 208 | 22 | 4 | 4 | 37 | 18 | 80 | 68 | 81 | 98 | 10 | 32 | 77 |
| | 92 | 5 | 2 | 1 | 47 | 25 | 75 | 42 | 72 | 90 | 3 | 21 | 49 |
| | 194 | 40 | 9 | 11 | 27 | 15 | 90 | 78 | 90 | 93 | 17 | 40 | 74 |
| *Enterococcus faecalis* | 218 | 53 | 10 | 8 | 24 | 10 | 90 | 88 | 90 | 95 | 17 | 47 | 90 |
| | 42 | 26 | 7 | 7 | 26 | 19 | 79 | 81 | 79 | 95 | 20 | 38 | 76 |
| | 333 | 61 | 16 | 13 | 27 | 14 | 91 | 87 | 97 | 93 | 25 | 54 | 90 |

| | Number | AS | CAZ | DORI | NETIL | PB | OFLOX | AT | NX | TET | DOX | PIT | GENTA | MERO | IMI | TOB | CPM | CFS | AMIKA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Non-Lactose fermenters | 119 | 39 | 52 | 51 | 40 | 98 | 44 | 54 | 35 | 44 | 54 | 72 | 56 | 56 | 66 | 54 | 47 | 51 | 59 |
| | 45 | 29 | 18 | 27 | 13 | 67 | 17 | 28 | 13 | 29 | 43 | 42 | 16 | 22 | 29 | 16 | 18 | 24 | 22 |
| | 83 | - | 35 | 40 | 31 | 41 | 40 | 28 | 28 | 53 | 53 | 64 | 54 | 52 | 54 | 52 | 43 | 53 | 46 |

| | Number | AS | AT | NX | TET | DOX | PIT | GENTA | MERO | IMI | TOB | CPM | CFS | AMIKA | CTX | CZ | CX | NF | ETP | FOS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Escherichia coli* | 976 | 21 | 21 | 14 | 25 | 27 | 58 | 49 | 75 | 74 | 34 | 22 | 51 | 58 | 18 | 15 | 53 | 69 | 64 | 84 |
| | 143 | 13 | 10 | 8 | 25 | 21 | 39 | 39 | 52 | 51 | 22 | 11 | 31 | 39 | 3 | 6 | 33 | 53 | 46 | 77 |
| | 31 | 46 | 32 | 32 | 36 | 42 | 77 | 61 | 93 | 87 | 45 | 32 | 68 | 87 | 36 | 29 | 58 | 97 | 81 | 95 |
| | 854 | 37 | 35 | 23 | 27 | 31 | 73 | 54 | 83 | 81 | 45 | 35 | 68 | 68 | 17 | 29 | 69 | 74 | 81 | 88 |
| *Klebsiella spps* | 94 | 27 | 40 | 35 | 56 | 48 | 48 | 45 | 55 | 56 | 38 | 36 | 44 | 49 | 3 | 22 | 38 | 32 | 48 | 55 |
| | 63 | 54 | 65 | 65 | 65 | 59 | 79 | 70 | 86 | 87 | 67 | 64 | 67 | 65 | 31 | 41 | 60 | 46 | 75 | 76 |
| *Citrobacter spps* | 33 | 36 | 33 | 39 | 63 | 58 | 52 | 49 | 55 | 52 | 39 | 46 | 39 | 39 | 12 | 18 | 30 | 24 | 46 | 73 |
| | 30 | 67 | 53 | 60 | 77 | 80 | 87 | 77 | 80 | 77 | 67 | 70 | 80 | 77 | 41 | 37 | 54 | 37 | 70 | 87 |
| *Enterobacter spps* | 43 | 23 | 35 | 33 | 49 | 44 | 51 | 47 | 65 | 63 | 37 | 40 | 49 | 44 | 29 | 19 | 33 | 21 | 53 | 72 |
| | 69 | 26 | 26 | 26 | 38 | 33 | 41 | 45 | 42 | 49 | 35 | 29 | 39 | 46 | 36 | 17 | 33 | 13 | 36 | 41 |

**Intrinsic resistance in *Psuedomonas aeruginosa***

- Intrinsic resistance can be defined as inherent or innate antimicrobial resistance, which is reflected in wild-type all or almost all representatives of a species (as per CLSI). It is so common that susceptibility testing to particular antimicrobial is not needed.
- *Pseudomonas aeruginosa* is intrinsically resistant to ampicillin, amoxicillin, ampicillin-sulbactam, amoxicillin-clavulanate, cefotaxime, ceftriaxone, ertapenm, tetracycline/tigecycline, trimethoprim, trimethoprim-sulfamethoxazole and chloremphenicol.

**Vancomycin Susceptibility of Staophylococcus spps. by VITEK 2® COMPACT (BioMérieux); January-December 2018**

| Organism | Detectable MIC range lower than susceptible MIC breakpoint (µg/ml) | | | Susceptible (µg/ml) | Intermediate (µg/ml) | |
|---|---|---|---|---|---|---|
| | <0.5 | 1 | 2 | 4 | 4 | 16 |
| CONS | 6 | 4 | 2 | 1 | 1 | 9 |

| Organism | Detectable MIC range lower than susceptible MIC breakpoint (µg/ml) | | Susceptible (µg/ml) | Intermediate (µg/ml) |
|---|---|---|---|---|
| | <0.5 | 1 | 2 | 4 |
| *Staphylococcus aureus* | 2 | 3 | 0 | 2 |

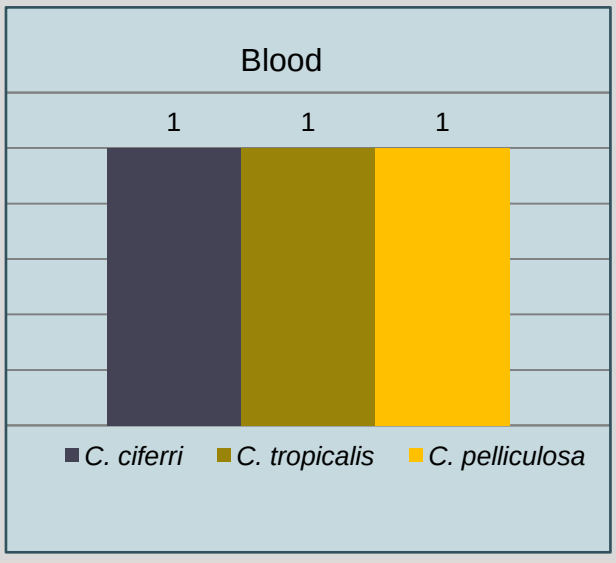
## Abbreviations used

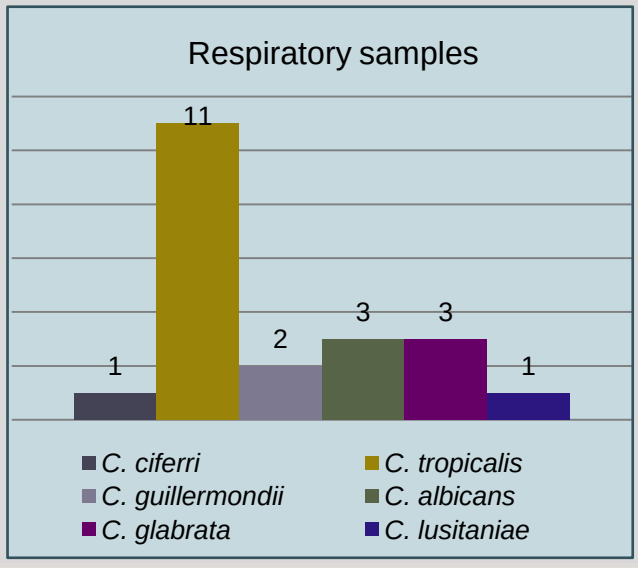
| | | | | | |
|---|---|---|---|---|---|
| AS | Ampicilin-Sulbactam | DORI | Doripenem | NX | Norfloxacin |
| AT | Aztreonam | DOX | Doxycycline | NF | Nitrofurantoin |
| AMIKA | Amikacin | E | Erythromycin | NETIL | Netilmicin |
| AB | Amphotericin B | ETP | Ertapenem | OFLOX | Ofloxacin |
| CAS | Caspofungin | FLU | Flucytosine | PIT | Piperacillin-Tazobactam |
| CAZ | Ceftazidime | FLC | Fluconazole | PENI | Penicillin |
| CTX | Cefotaxime | FOS | Fosfomycin | PB | Polymixin-B |
| CX | Cefoxitin | GENTA | Gentamicin | TOB | Tobramycin |
| CFS | Cefoperazne- Sulbactum | HLG | High level Gentamicin | TET | Tetracycline |
| CPM | Cefipime | IMI | Imipenem | TEICO | Teicoplanin |
| CHLOR | Chloramphenicol | LZ | Linezolid | VRC | Voriconazole |
| CD | Clindamycin | LEVO | Levofloxacin | VA | Vancomycin |
| CIPRO | Ciprofloxacin | MERO | Meropenem | | |
| COL | Colistin | MYC | Micafungin | | |

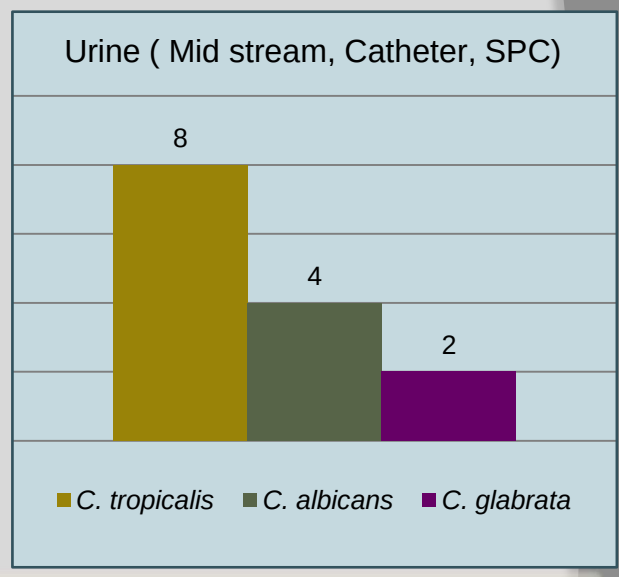
## Colistin Susceptibility in Gram Negative isolates by VITEK 2® Compact BioMérieux; January to December 2018

| Micro organisms (Number) | Detectable MIC range Lower than susceptible MIC breakpoint | | Susceptible | Resistant | Detectable MIC range Higher than resistant MIC breakpoint | |
|---|---|---|---|---|---|---|
| | ≤ 0.5 µg/ml (% of Isolates) | 1µg/ml (% of Isolates) | 2µg/ml (% of Isolates) | ≥ 4µg/ml (% of Isolates) | 8µg/ml (% of Isolates) | ≥ 16µg/ml (% of Isolates) |
| *Escherichia coli (39)* | 79.5% | --- | --- | --- | --- | 20.5% |
| *Klebsiella pneumoniae (62)* | 71% | --- | --- | 3% | 2% | 24% |
| *Enterobacter cloacae (15)* | 67% | --- | --- | --- | --- | 33% |
| *Acinetobacter baumannii (53)* | 83% | 2% | 4% | 2% | --- | 9% |
| *Pseudomonas aeruginosa (73)* | 53.5% | --- | 3% | 5% | 3% | 35.5% |

## Mycology data



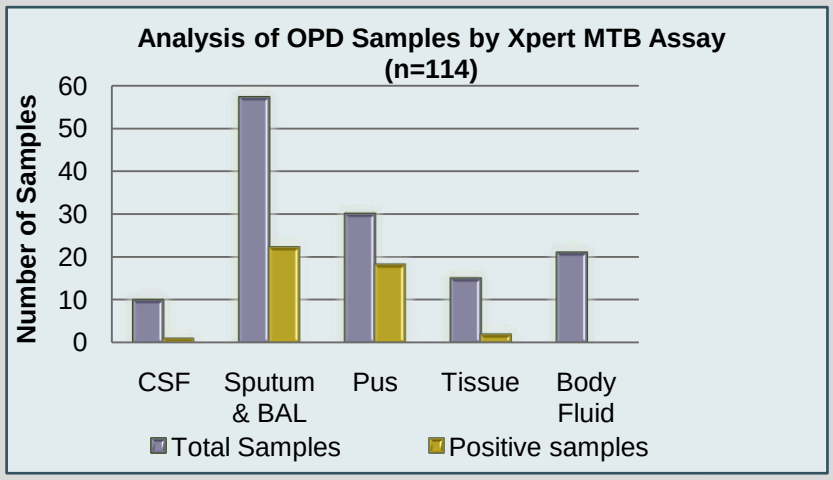



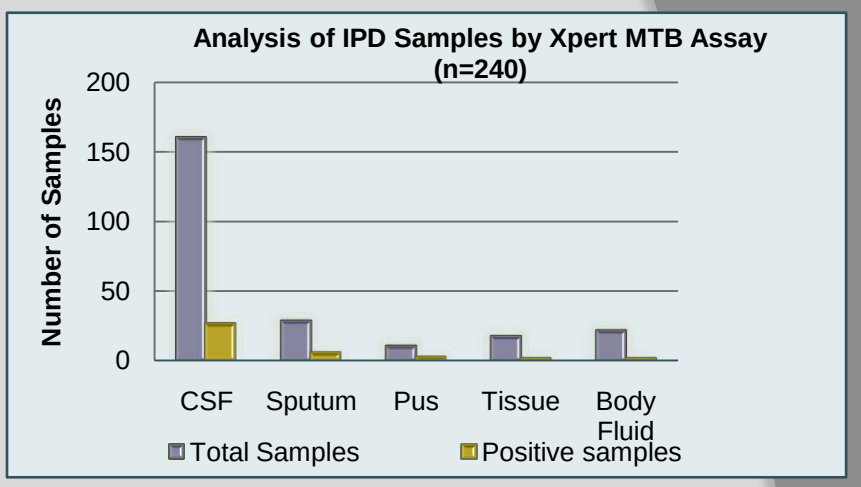




**Antifungal Susceptibility Testing :** was carried out only when requested

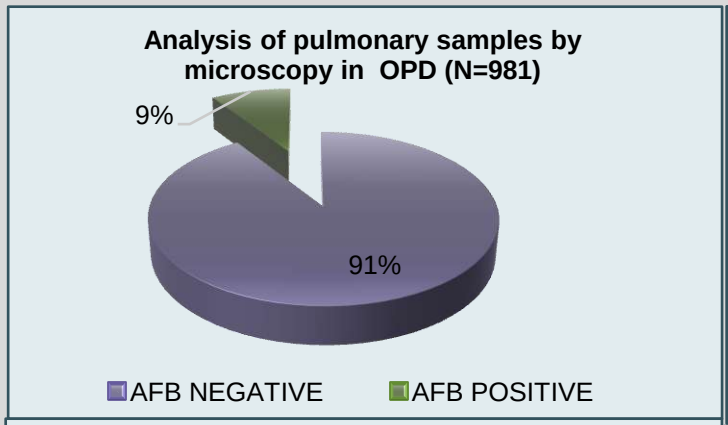
| Sample | Fungal Isolates | Total Number of Isolates | FLC | VRC | CAS | MYC | AB | FLU |
|---|---|---|---|---|---|---|---|---|
| **Blood** | *C. ciferri* | 1 | - | 1 | - | - | 1 | - |
| | *C. tropicalis* | 1 | 0 | - | 1 | - | 0 | 1 |
| | *C. pelliculosa* | 1 | 1 | 1 | 1 | - | 1 | 1 |
| **Respiratory Samples** | *C. ciferri* | 1 | - | 1 | - | - | 1 | - |
| | *C.tropicalis* | 11 | 7 | 5 | 5 | 5 | 7 | 11 |
| | *C. guillermondii* | 2 | 2 | 1 | 1 | 2 | 1 | 1 |
| | *C. albicans* | 3 | 3 | 2 | 3 | 3 | 2 | 3 |
| | *C. glabrata* | 3 | - | 2 | 3 | 2 | 2 | 3 |
| | *C. lusitaniae* | 1 | 1 | 1 | 1 | - | 1 | 1 |
| **Urine** | *C. tropicalis* | 8 | 6 | 7 | 4 | 5 | 5 | 8 |
| | *C. albicans* | 4 | 3 | 3 | 3 | 3 | 3 | 3 |
| | *C. glabrata* | 2 | - | 2 | 1 | 2 | 2 | 2 |

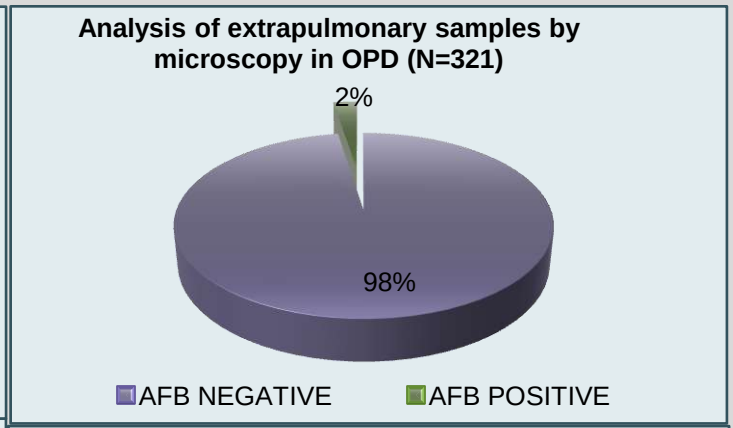
# Tuberculosis lab data

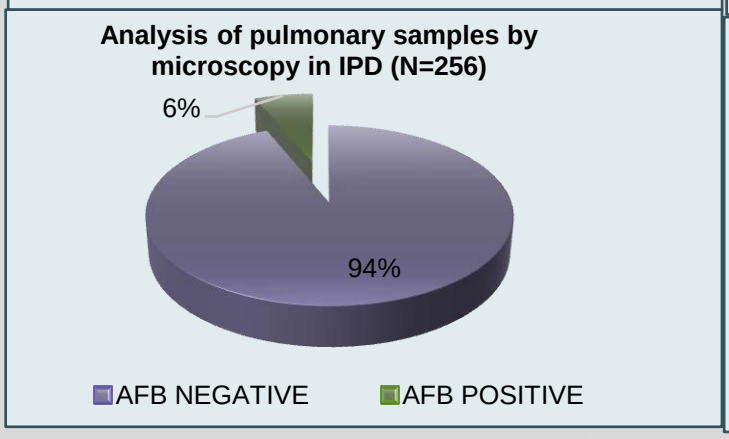


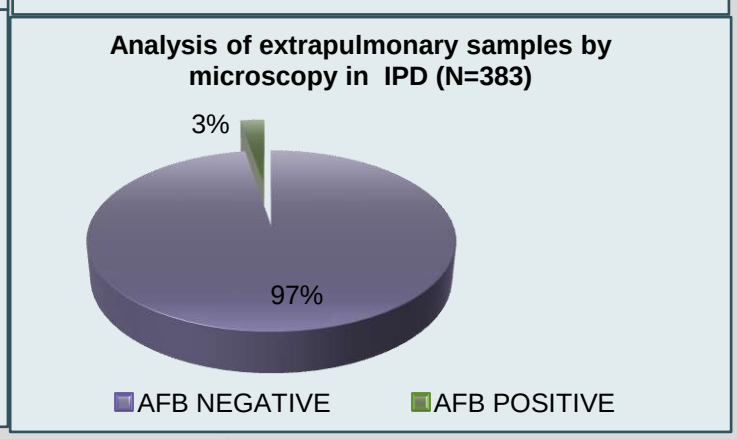




## AFB MICROSCOPY DATA

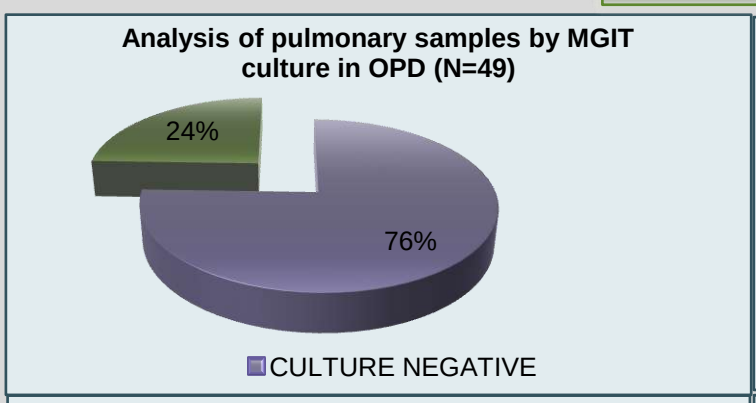


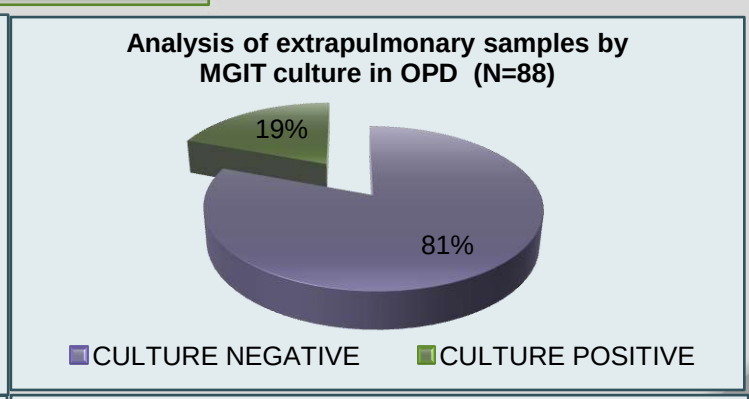



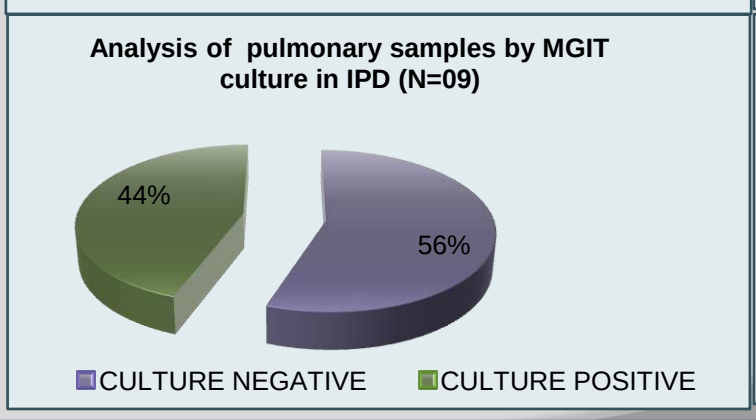



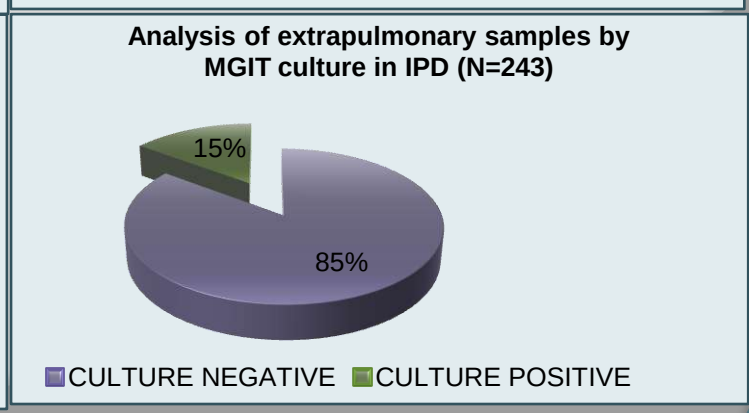




## TB CULTURE DATA



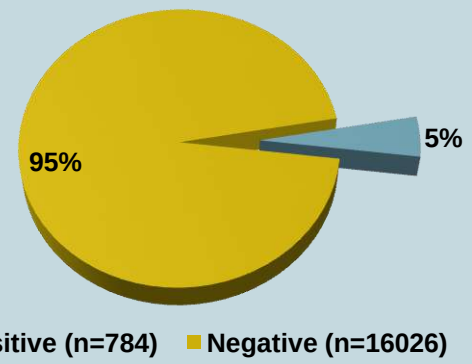



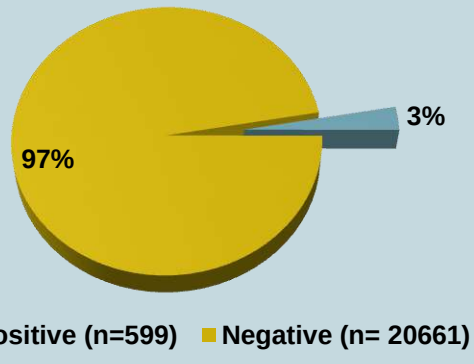



# Serology/Immunogy lab data

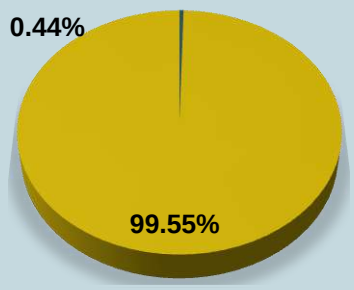
## HBsAg
January-December 2018 (n=16810)




## Anti HCV IgM Antibody
January-December 2018 (n=21260)



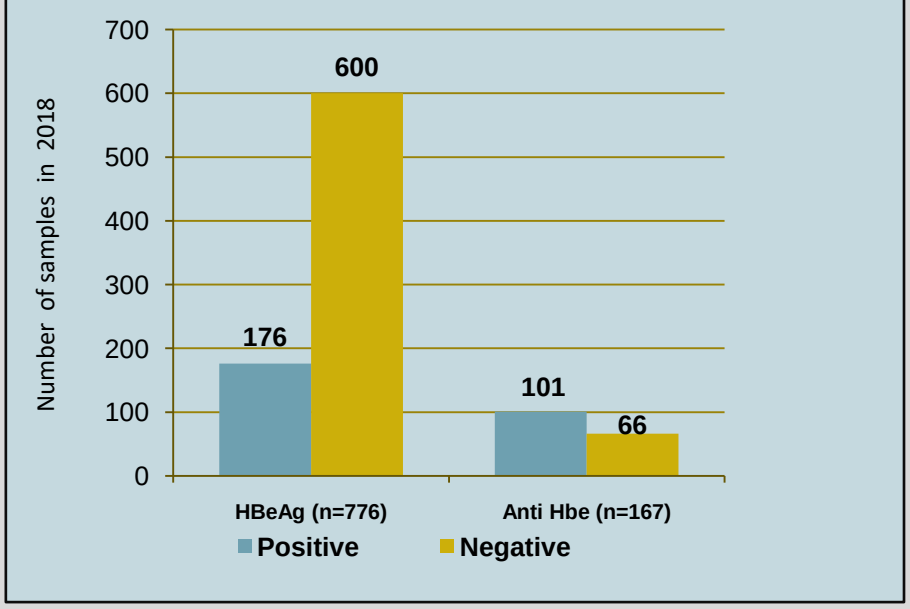

## Anti HIV Antibody*
January-December 2018 (n=12241)



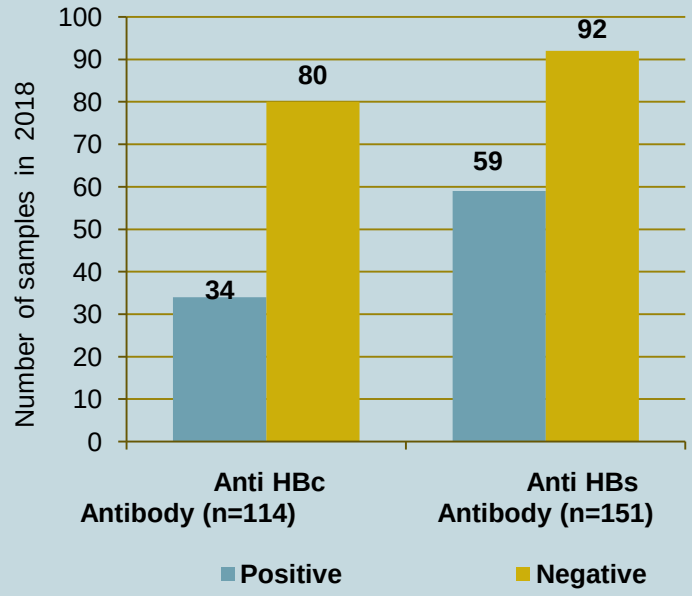

*samples received were for pre-op evaluation

Positive Negative

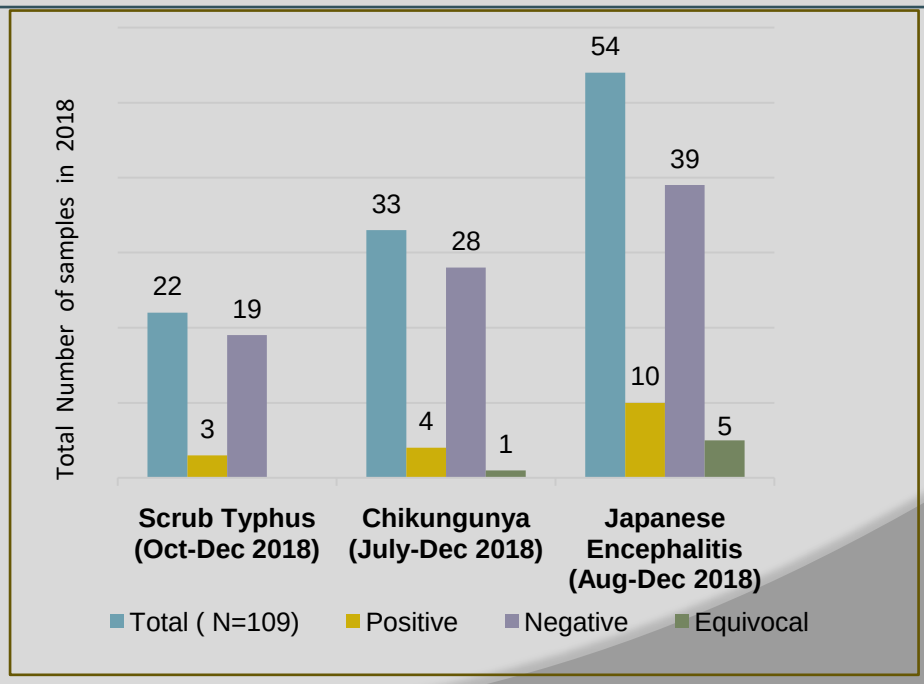
## HBeAg and Anti Hbe Antibody



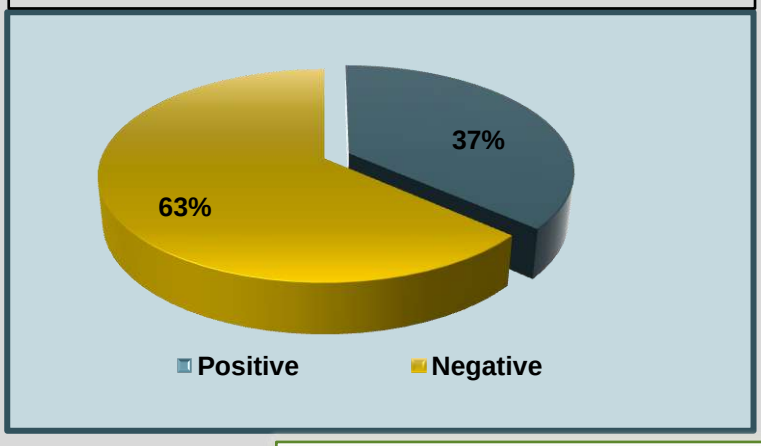

## Anti HBc Antibody and Anti HBs Antibody



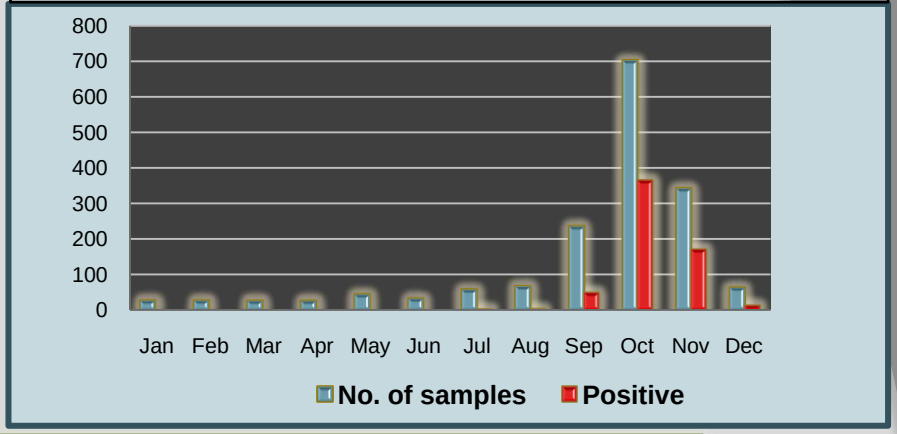

## Result of Scrub Typhus IgM ELISA, Chikungunya IgM ELISA and Japanese Encephalitis IgM ELISA



**Dengue serology, January- December 2018 (n=1643)**

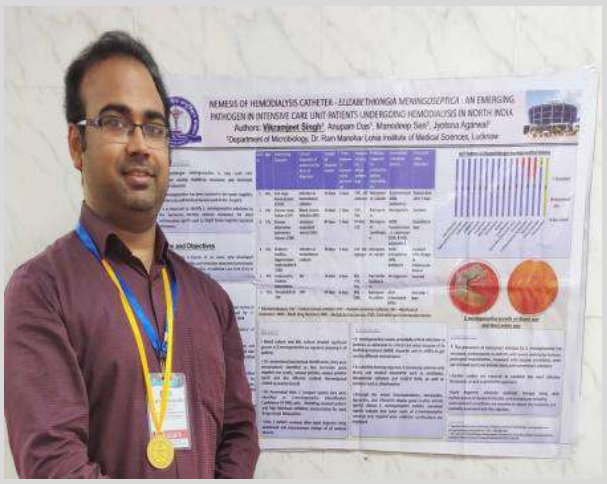



**Month wise Dengue case distribution for year, 2018**




- **Positive includes all samples positive for NS1 or positive/equivocal for IgM or Both**
- **Maximum dengue cases appeared during September to November 2018**


**An Agar art competition was held in the Microbiology department and the winning entry is featured on the cover**
**First Position**: Dr. Pranshu Pandey- Louis Pasteur; **Second Position**:Dr. ManoramaYadav- Tree Sun in Blood Agar; **Third Position:**Dr. VaishaliJyoti- Lady with the Cigar; **Fourth Position** (Tie): Dr. Kriti Maurya; **Fourth Position** (Tie):Dr. Apurva Rautela- Tree & Bird; **Fifth Position**: Dr. Peetam Singh- Microbiology News Letter


**Exemplary performance by team Lohia in UP-UK MICROCON 2019, won Best Poster Awards in 3 categories** *(From left to right)*
**Dr. Sana Islahi –** Bacteriology - "Antimicrobial susceptibility profile of *Staphylococcus aureus* isolated from pyogenic infections-Variations encountered at secondary and tertiary care level centres." Sana Islahi, Manodeep Sen, Anupam Das, Jyotsna Agarwal.
**Dr. Vikramjeet Singh** - Hospital Infection - "Nemesis of hemodialysis catheter- Elizabethkingia meningoseptica: an emerging pathogen in ICU patients undergoing hemodialysis in North India." Vikramjeet Singh, Anupam Das, Manodeep Sen, Jyotsna Agarwal.
**Dr. Kriti Maurya –** Mycology - " Rare isolation of Trichophyton soudanense: A case presentation" Kriti Maurya, Anupam Das, Manodeep Sen, Jaya Garg, Sana Islahi, Jyotsna Agarwal.

## *Candida auris*: The Sudden Emergence and What lies ahead?

*Dr. Anupam Das, Associate Professor, Department of Microbiology, RMLIMS, Lucknow*

*Candida auris*, named after its first known isolation from the ear canal from a patient in Japan in 2009, has neither remained localized geographically nor in the site of initial isolation since then. *Candida auris* had been reported in invasive infections of multiple sites of body & in outbreaks of healthcare settings in multiple countries in five continents till date.

The sudden emergence of the species is supported by the fact that only two historical stock isolates (South Korea:1994; Pakistan:2008) preserved prior to 2009 were proved to be *Candida auris* except which none stock strains tested (thousands of isolates from four continents of SENTRY) were proved to be misidentified to be *Candida auris.*

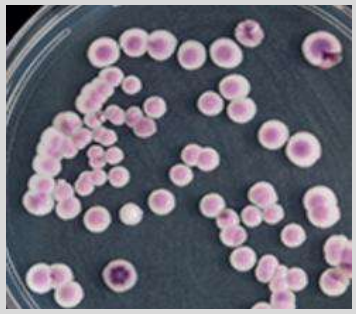
**Notoriety of *Candida auris:***

*C. auris* stands out of all other pathogenic yeast species because of its enhanced propensity to be transmitted between patients, across healthcare facilities, the higher drug resistance trait with mortality rates of invasive infections being ranging from 30 to 50%. The persistence of *C. auris* in dry & moist surfaces have been shown to be greater than that of *C. albicans.*

*C. auris* is difficult to be eradicated once colonized as had been suggested by studies isolating 3 months or more after initial detection inspite of negative screens & echinocandin treatment in the intervening period. *Candida auris* is acquired as early as 4 hours from any infected colonized patient or the environment with invasive infections being acquired within 48 hours of admission to intensive care units.

**Problem with Identification:**

The identification of *C. auris* poses a challenge as with the commonly available phenotypic and biochemical methods, including the automated ones {e.g. Vitek 2 (Biomerieux)}misidentifying as other species (e.g *C. haemulonii* etc. Some of the recent studies have proposed the use of chromogenic agar to differentiate between *C. auris* and *C. haemulonii* isolates using growth characteristics. C. auris forms pink to beige colonies on chromogenic agar Candida medium and grows well at 42°C but with variable growth at higher temperatures and no growth in the presence of 0.01% cycloheximide. It forms oval or elongated yeast cells, which can occur singly, in pairs, or in groups. Importantly, no hyphal or pseudohyphal forms have been noted.



*Candida auris* on CHROMagar, displaying multiple colony morphologies

The definitive methods for identification of these strains are MALDI-TOF MS (subject to availability of reference spectra) or recently developed PCR based assays. Both of which may not be available in all the healthcare settings.

**Resistance Profiles and Treatment**

As there are no antifungal clinical breakpoints reported for *C. auris,* at present guidances are obtained from studies which have detected MICs obtained for *C. auris* isolates & compared them to the breakpoints determined for other Candida species (CLSI and EUCAST clinical breakpoints) being supported by PK/PD data from a *C. auris* candidemia mouse model, although a correlation with clinical outcomes are yet to be established.

Considering the seriousness of *Candida auris* infection, empirical therapy is warranted in suspected cases or in sudden deterioration of cases with colonization of *C.auris*. In view of the resistance against triazoles Echinocandins are being recommended as an empirical therapy, however reports of reduced susceptibility to echinocandins are being reported in view of their increasing use. Also one should be aware of the limited penetration of echinocandins in many body sites including CSF, due to its high molecular weight; hence very little active drug is recovered from urine. Recent research has shown promising result in in vitro studies into the synergistic action of micafungin & voriconazole for multiresistant isolates, however same has not been shown with other other combinations of azole & echinocandins. A number of isolates of C. auris have demonstrated raised MICs of multiple classes of antifungal agents, raising the possibility of pandrug resistance, which is of grave concern.

**Infection Prevention and Control**

Observations of rapid acquisition, an association with high mortality rates, and high levels of antifungal resistance highlight the importance of rapid implementation of IPC measures to curb transmission. Due to the limited data on this emerging pathogen, much of this guidance is empirical, based on extrapolation from other multidrug resistant bacteria (e.g. MRSA) associated with health care associated infections.

**Efficacy of Disinfectants:**

With the limited data available on the effectiveness of disinfectants against *Candida auris* , chlorine based products appear to be most effective for environmental surface disinfection. Other disinfectants, although less effective than chlorine based products may have a role in adjunctive disinfectant. Decolonization is also a problem issue in view of the long persistence, Chlorhexidine. gluconate has shown some efficacy in in vitro studies but there are reports of patients with persistent colonization despite twice daily body washes with this disinfectant. Hand hygiene using soap and water, with or without chlorhexidine gluconate, may require the subsequent use of alcohol-based hand sanitizer for maximal disinfection.

Continued on next page…..

**Summary:**
***Candida auris*** is a notorious rapidly emerging pathogen, with the alarming threat of pan antifungal drug resistant isolates being spread worldwide with the capacity to spread very quickly from patient to patient or other sources in critical care setting to cause rapid deterioration of the patients condition due to development of rapid invasive infection. The priority for us should be the local control of the organism as soon as there is slightest suspicion. Suspicion because, it is difficult to identify in all settings due to the requirement of specialized identification system, which also implies that the magnitude of the problem may be much higher than that we have in literature. Understanding the biology of the pathogen and rapid identification at all healthcare settings to curb the spread should be priority before it becomes a problem of a magnitude as high as and uncontrollable as we have with the MDR Gram Negative Organisms at health care settings, the capability which *Candida auris* definitely has. It is only time which can tell us whether *C.auris* will disappear as suddenly as it has appeared.

**References:**
1. Sears D, Schwartz BS. Candida auris: An emerging multidrug-resistant pathogen. Int J Infect Dis. 2017 Oct;63:95-98.
2. Colombo AL, Júnior JNA, Guinea J. Emerging multidrug-resistant Candida species. Curr Opin Infect Dis. 2017 Dec;30(6):528-538.
3. Jeffery-Smith A, et al. Candida auris: a Review of the Literature. Clin Microbiol Rev. 2017 Nov 15;31(1).

## Community acquired Pulmonary Nocardiosis in a Case of Heart Failure in a Tertiary Care Superspeciality Institute

*Dr Pranshu Pandey, Dr Meher Khan, Dr Vineeta Mittal*

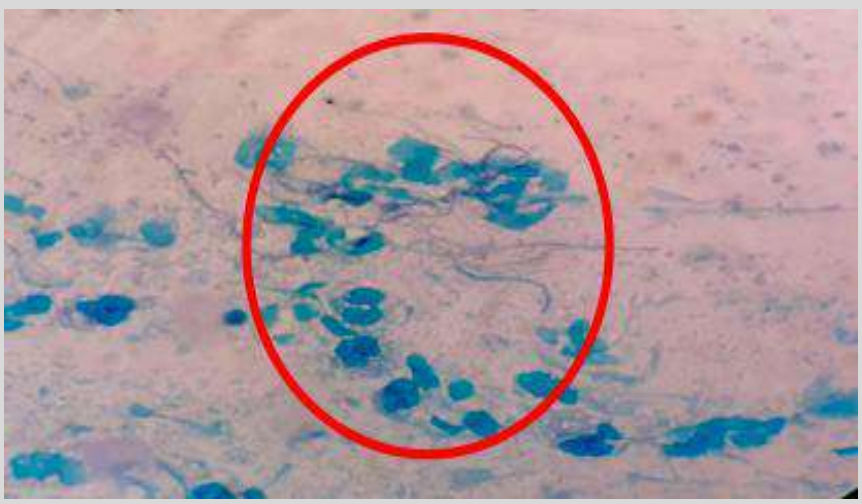
### Introduction

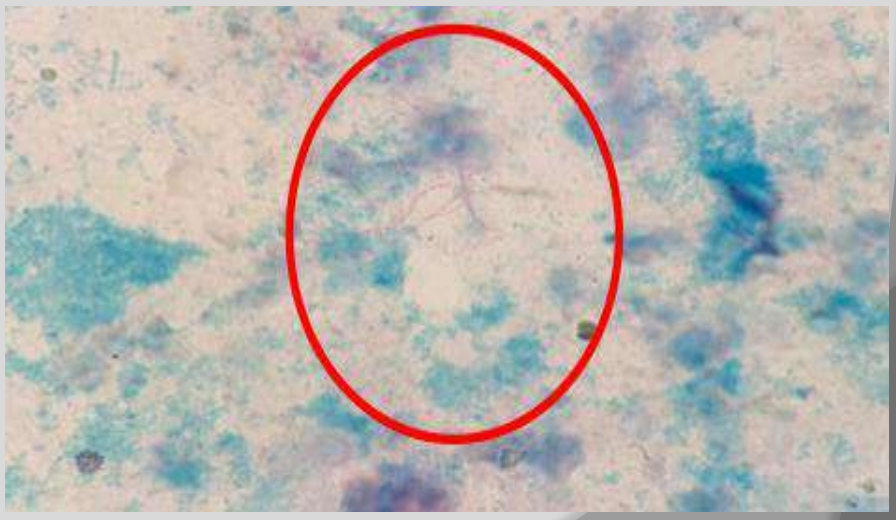
*Nocardia* is a family of Gram positive opportunistic organisms that can appear as acute, subacute and chronic infectious diseases and occurs in cutaneous, pulmonary and disseminated form. There are more than 80 species of *Nocardia,* only 33 of which cause illness in humans. *Nocardia farcinica* is the most virulent of these species. Nocardiosis is a cause of significant morbidity and mortality in the immunocompromised host.

### Case Report

A 60 year old male who was a known case of Hypertension, Type 2 Diabetes mellitus and Heart failure and on regular medication for the same presented to OPD with chief complaints of cough with expectoration for 15 days associated with shortness of breath which has increased in due course of time. There was no history of fever. Patient had occupation history of working in a jute mill for around 30 years. On presentation patient was in respiratory distress. On general examination patient had pallor and generalized edema. Patient was tachypnoeic with respiratory crackles in both lungs and decreased air entry in right lower lobe on auscultation. Heart rate was 110/min and Blood pressure was 110/70mmHg. There was no history of hospitalization in past 1 year.

Patient was advised for CXR PA view which showed patchy infiltrates in both lungs with right lower lobe consolidation and hilar lymphadenopathy. Blood investigation was followed which showed increased Total Leucocyte counts to 18,600/cumm with increased polymorphs, CRP was raised to 12mg/L, Serum urea was 73 mg/dl and Serum creatinine was 0.86 mg/dl. Patient was advised for hospitalization, but he denied the same. The treating clinician suspected pulmonary tuberculosis and ordered for AFB staining of sputum. The AFB staining revealed moderate presence of acid fast thin delicate branching filaments pointing towards *Nocardia* spp.. As clinical microbiologist further identification was done using modified Kinyoun staining which showed acid fast filamentous and branching structure confirming *Nocardia* spp. pointing towards community acquired pulmonary Nocardiosis. Further sample was requested from patient for follow up and culture, but unfortunately the patient expired before the sample could be procured.





### Conclusion

Community acquired pulmonary Nocardiosis could be due to diabetic status of the patient which develop an immunocompromised state and it is apparent that cases of community acquired Nocardiosis are present which needs proper investigation and follow up to be recognized and given early treatment.

## SCRUB TYPUS: Emerging yet Treatable Rickettsial Disease

*Dr. Jaya Garg, Associate Professor, Department of Microbiology, RMLIMS, Lucknow*

Scrub typhus is a serious public health problem in the Asia-Pacific area. Scrub typhus, also known as tsutsugamushi disease, is caused by the arthropod borne Gram-negative obligately intracellular bacillus *Orientia tsutsugamushi.*

**Prevalence in India**

There is an estimated one million new scrub typhus infections each year, and over one billion people around the world are at risk. The peak of the disease is between August and October. Without appropriate treatment, the case fatality rate of scrub typhus can reach 30% or even higher.

Disease occurs all over India, from South India to Northeast India and Northwest India. There were cases reported from Maharashtra, Tamil Nadu, Karnataka, Kerala, Himachal Pradesh, Jammu and Kashmir, Uttaranchal, Rajasthan, West Bengal, Bihar, Meghalaya, and Nagaland. Recently a study from Bihar evaluated major role of scrub typhus (25%) among cases of encephalitis. Bihar strains resembled Gilliam-like strains from Thailand, Combodia and Vietnam.

**Clinical feature**

Approximately 5 to 14 days after being bitten by an infected vector, a *Leptotrombidium* mite, patients begin to exhibit manifestations of infection such as non-specific flu-like symptoms, fever, rash, eschar at the bite site, headache, myalgia, cough, generalized lymphadenopathy, nausea, vomiting, and abdominal pain. Fever and headache are the most common features among scrub typhus patients. Between 95% and 100% of confirmed cases were noted to have fever in several studies.

**Complications**

Severe complications such as multiorgan failure occur in some cases. The severe multiorgan manifestations include jaundice, acute renal failure, pneumonitis, acute respiratory distress syndrome (ARDS), myocarditis, septic shock, and Disseminated intravascular coagulation (DIC). Though, lung is one of the main target organs leading to pulmonary complications, **Meningitis and/or encephalitis** emerged as a severe illness in infected cases.

**Diagnosis**

Scrub typhus is tested by IgM ELISA and confirmed by PCR and sequencing. Serology remains the mainstay of diagnosis. In primary infection with *O. tsutsugamushi*, a significant antibody titer is observed at the end of the 1st week, which are mainly IgM antibodies, whereas IgG antibodies appear at the end of the 2nd week. In the case of re-infection with *O. tsutsugamushi*, IgG antibodies are detectable by day 6, with IgM antibody titers being variable. The Gold standard for diagnosis of scrub typhus is IFA, however an improved, easy-to-operate, and cost-effective alternative is ELISA.

**Treatment**

Doxycycline is one of most effective antibiotics for treating scrub typhus. Antibiotics are usually able to abate patients' fever rapidly, and this outcome is even used as a diagnostic indicator. Rifampicin was shown to be more effective than tetracycline in patients responding poorly to doxycycline. World Health Organization (WHO) recommends that pregnant women or children can use azithromycin or chloramphenicol. Antibiotic resistance has been reported in a few paper.Oral treatment is effective for mild cases, but the parenteral route is often necessary for severely ill patients.

**Prophylaxis**

WHO recommends prophylactic treatment under special circumstances in the endemic areas. A single oral dose of doxycycline, chloramphenicol or tetracycline every 5 days for a total of 35 days provided protection against *Orientia* infection. However, CDC in the U.S. does not recommend using antibiotics as prophylaxis for rickettsial diseases including scrub typhus because the preventive treatment may simply delay onset of disease and make diagnosis more difficult [224,229]. To treat rickettsial diseases more effectively, CDC suggests starting treatment based on clinical suspicion alone.

In Department of Microbiology , RMLIMS we are doing IgM ELISA for diagnosis of scrub typhus in serology section on serum specimen of patients suspected with scrub typhus.

We have recently started this test on HIS so that early and specific treatment will result in better outcomes, i.e., shortening the disease course and reducing fatalities. This test is free of cost for patients of Dr RMLIMS.

References:

1. Guang Xu, David H. Walker, Daniel Jupiter et al .A review of the global epidemiology of scrub typhus PLOS 2017. Neglected Tropical Diseases;11(11):2-27
2. Sayantani Chakraborty and NilenduSarma. Scrub Typhus: An Emerging Threat. Indian J Dermatol 2017 Sep-Oct; 62(5):478-485
3. Alison Luce-Fedrow , Marcie L. Lehman, Daryl J. Kelly et al .A Review of Scrub Typhus (Orientia tsutsugamushi and Related Organisms): Then, Now, and Tomorrow. .Trop. Med. Infect 2018. Dis; 3: 8
4. Jain P, Prakash S, Jain A, et al. Emergence of *Orientia tsutsugamushi* as an important cause of Acute Encephalitis Syndrome in India. PLoS Neg Trop Dis 2018 12(3)

## Microbiologically proven case of primary breast tuberculosis

*Dr Meher Khan, Dr Ashish Verma, Dr Vineeta Mittal*

**Introduction**

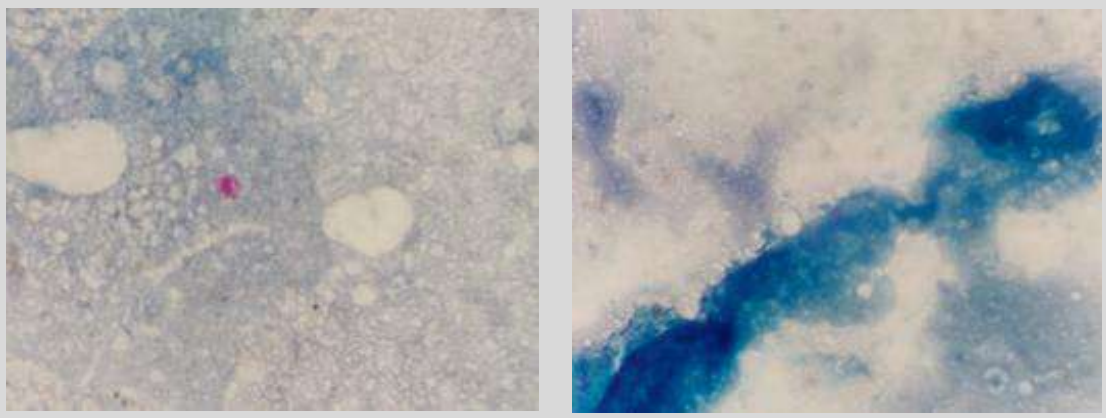
Breast tissue is resistant to tuberculosis as is spleen and skeletal muscle. Thus tuberculosis of breast is quite uncommon with an incidence of 0.1% - 3% of all breast diseases treated surgically. Breast tuberculosis can be classified into three categories, namely, nodular, disseminated, and abscess varieties. This classification takes into consideration the changes seen in clinical presentation of tuberculosis over the last two decades. Tuberculous breast abscess is more frequent and represents up to 30 % of cases in recent publications. The disease affects females in the younger age group, pregnancy and lactational period being the periods of highest risk. Breast TB can mimic breast carcinoma or breast abscess, clinically and radiologically. Concomitant axillary lymph nodes were found in one-third of the patients with breast TB.

**Case Report**

A 19 year old female, resident of Narhigaon, Pratapgarh presented to our hospital with complaints of painful breast lump in right breast since 3 months. There was no history of evening rise of temperature, smoking or having risk factors for HIV or a recent exposure to tuberculosis. Patient had no past history of tuberculosis, hypertension, diabetes and no family history of breast cancer. The systemic examination was non-contributory. Physical examination confirmed a palpable lump in the upper-outer quadrant of the right breast, measuring about 1 × 2 cm, tender, non adherent to skin or underlying muscle. There were no clinical manifestations of the disease in the nipple-areolar area or nipple discharge. Ultrasonography examination revealed multiple pockets of collection with moving internal echoes noted in retroareolar region and outer quadrant of right breast, with largest pocket measuring 1.75 x 4.82 x 5.09cm. Few necrotic lymph nodes were also noted in the right axilla. Left breast appeared to be normal. Chest X-ray was within normal limits. Routine hematologic and biochemical parameters were in the normal range. Pus aspirated from the breast lump did not show any growth on aerobic and anaerobic bacteriological culture. ZN staining showed acid fast bacilli and GeneXpert results showed MTB detected with no rifampicin resistance. Patient was started on ATT.

**Discussion**

In India, various studies have reported the importance of histopathological examination in breast TB diagnosis, however there is scarcity of data related to microbiological diagnosis of breast TB. Usually patients with breast TB present late to clinics, when already there is granuloma formation and clinicians because of diagnostic dilemma send the samples for histopathological examination rather than microbiological investigations. Mycobacteriological diagnosis in the form of ZN staining, liquid culture (MGIT) and CBNAAT too plays an important role in identifying the causative organisms and its drug susceptibility pattern, which helps clinician in early diagnosis and prompt treatment.



**ZN stain showing AFB**

**References**

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da Silva B.B., Lopes-Costa P.V., Pires C.G., Pereira-Filho J.D., dos Santos A.R. Tuberculosis of the breast: analysis of 20 cases and a literature review. Transactions of the Royal Society of Tropical Medicine and Hygiene. 2009;103:559–563.

Thimmappa D, Mallikarjuna MN, Vijayakumar A. Breast Tuberculosis. *Indian J Surg*. 2015;77(Suppl 3):1378-84.

**New tests added in the Department of Microbiology**

- Japanese Encephalitis IgM Capture ELISA (Free of cost)
- Scrub Typhus IgM ELISA (Rs 715/-)

Complete list of investigations carried out in our department, along with volume of sample & type of container is available at http://www.drrmlims.ac.in/hostipalservices.php.php in ***click here*** segment of Microbiology

## Endonyx onychomycosis due to *Trichophyton soudanense* : Rare case with successful treatment

*Sana Islahi, Kriti Maurya, Jaya Garg, Anupam Das, Manodeep Sen, Abhilash Chandra, Jyotsna Agarwal*

**Introduction :** Dematophytoses are infections of the skin, hair and nails, caused by dermatophytes, namely *Trichophyton* spp*, Microsporum* spp and *Epidermophyton floccosum*. Dermatophytes have a worldwide distribution, but few species are endemic in specific areas of the world.[1] *Trichophyton soudanense* is an anthropophilic fungus that is a frequent cause of tinea capitis in Africa. Besides Africa, some imported cases are now been reported from Europe, Brazil, Australia and USA.[2] This is probably the first case report of onychomycosis caused by *T.soudanense* in India, however 3 cases of *T.soudanense* causing tinea capitis, tinea unguium, tinea corporis from North India[3] and 2 cases causing tinea corporis and tinea cruris from south India have been reported. [4]

**Case Report :** A 40 year old male, software engineer residing in Philippines since four years**,** with no comorbidities developed a milky white growth of his left toe nail in October 2017. It gradually increased, but remained confined to single toe nail only. He is required to wear shoes for around 10-12 hours a day. He came back to India on August 2018 and the case was referred to our department for fungal microscopy and culture, from the outpatient department of Nephrology of our institution, where he visited for a minor complaint. There were no clinical signs of inflammation in the nail bed. Direct 10% KOH mount from the specimen was positive for fungal elements and culture of the specimens on Sabouraud's dextrose agar supplemented with 0.05% chloramphenicol and 0.5% cycloheximide yielded colonies which were slow growing, initially flat, with a suede-like texture, a spidery edge and a distinctive orange-yellow color, after 3 weeks of incubation at $25^0$C [Fig 1]. Lactophenol cotton blue mount of the slide culture exhibited short, segmented hyphae, reflexive branching and no macroconidia which were characteristic of *T. soudanense* [Fig 2a,2b]. On Lowenstein-Jensen medium, the isolates produced dark brown pigment. Urease test and hair perforation test were negative.[1] He was started with Itraconazole 200 mg BD for first seven days of every month, since August 2018. The fresh healthy nail started growing in his toe.

**Conclusion :** Our findings provide evidence for the ongoing evolution of dermatophytosis epidemiology related to international travel and shifts in population demographics. In the era of economic liberalization, when people have started travelling abroad more frequently, isolation of uncommon dermatophytes can occur anywhere in the world and medical microbiologist should keep themselves updated in diagnosing such isolates. A recent study has suggested that *T. soudanense* is more closely related to *T.rubrum*.[4] These evolutionary relationships are interesting and important in explaining the unexpected isolation of *T. soudanense* in nonendemic regions of the world.

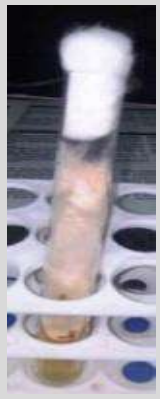
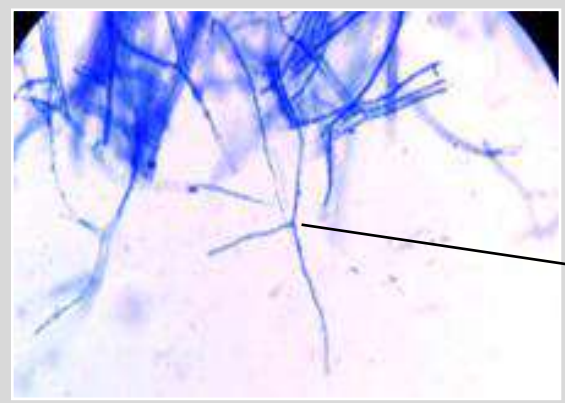


**Fig 1: Colony morphology of *Trichophyton soudanense* on Sabouraud's Dextrose Agar**



**Reflexive or right-angle branching**

**Figs 2a,2b: Lactophenol cotton blue (LCB) mount of *Trichophyton soudanense* showing the characteristic segmented hyphae with no macroconidia (LCB, ×400)d.[5]**

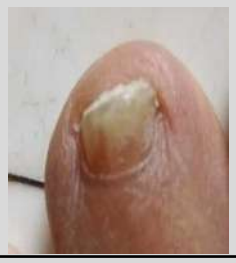


**Fig 3: Before treatment**

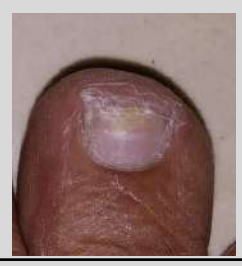
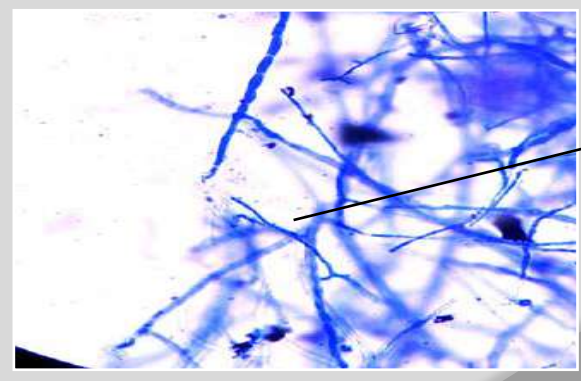


**Fig 4: After three months of treatment**



**Barbed wire appearance**

**References :**
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**Modification in HIS: A beginning to better clinical correlation and creation of paperless environment**

*Dr. Vikramjeet Singh and Prof. Jyotsna Agarwal*

Hospital Information System (HIS) can be defined as a massive, integrated computer system, designed to store and retrieve information and clinical aspects that support the comprehensive information requirements of hospitals, including patient, clinical, ancillary and financial management by creating a paperless environment. Hospitals are extremely complex institutions with various departments and they are becoming more reliant on the ability of HIS to assist in the diagnosis, management and education for better and improved services and practices.

Before July 2018, in our hospital, with every requisition for bacteriological/fungal culture a 'yellow colored form' was sent in which patient's clinical detail and antibiotic administered were manually filled by the concerned resident/nursing staff. From January 2018 to June 2018, we received 5166 such Yellow forms. The problem with this system was the inertia in filling the forms, and more often than not, culture specimens would be received in our laboratory without any such form. As is obvious, it was difficult to interpret the results in absence of clinical details. In July 2018, we took an initiative to integrate this with HIS; and an additional 'pop up window' in the HIS application was developed for entering the patient's clinical information while raising bacterial/fungal culture requests.

However, the approach was not completely hassle free, in first 2 months, many staff had problem in understanding and entering the desired details in HIS; while few forgot to enter it. A continuous support and monitoring was extended in order to move towards a paperless environment. In last 4 months (Sept-Dec 2018) we have achieved success in halting the use of yellow form upto 80-90%. More importantly there was significant increase in obtaining necessary clinical details of patients' as well; which in turn led to better clinico-microbiological correlation (33% during yellow forms to 78% with new HIS format).

A significant step indeed!! We wish to thank all the doctors and nursing staff for their continuous support

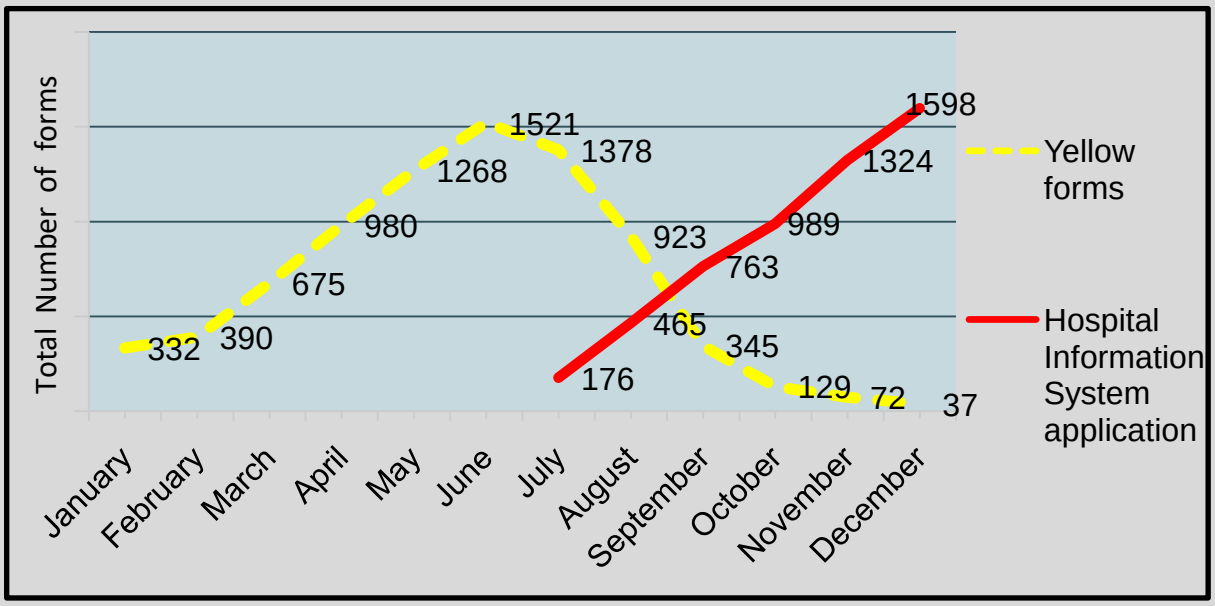


**Image : Trend of Yellow requisition form and HIS based application**


**CME on Fungal Sepsis (held on 17/03/2018 )**

5TH issue of RML newsletter was released. Prof Arunaloke Chakrabarty was the keynote speaker

## A Very Rare Pathogen: *Bordetella bronchiseptica* from unusual infection site in patient under Critical Care

*Sana Islahi, Akanksha Gupta, Shalini Trivedi, Manodeep Sen, Anupam Das, Jyotsna Agarwal*

**Introduction**: *Bordetella bronchiseptica* is a pleomorphic Gram-negative coccobacilli that commonly causes respiratory tract infections in dogs. *Bordetella bronchiseptica* infections in humans is a very rare entity and less than 40 cases of infections involving bloodstream, respiratory tract, surgical wound infections have been described in literature[1]. It is a unique case because we could not find any prior published case report of *B. bronchiseptica* associated with wound infection in humans.

**Case report**: A 15 year old girl had been admitted in ICU since 18 months. She had been on ventilator. The girl had developed chicken pox some 2 years back. Following this she suffered from post viral encephalopathy with cerebral palsy. Since then she is admitted , has also developed bacteremia due to *Acinetobacter baumannii* and fungaemia due to *Candida tropicalis*. Recently she developed an ulcer on her chest just above her right breast at the site of chemo-port. A swab sample was sent from this ulcer for culture and sensitivity. Culture was done on Blood Agar and MacConkey Agar. On blood agar, small greyish white and shiny haemolytic colonies (1-2 mm in diameter after 24 hours of incubation) were seen (Fig.1). On MacConkey agar non-lactose fermenting, pale colonies were seen (Fig.2). On Gram stain, Gram-negative coccobacilli were observed. Primary tests used in the identification were indole negative, methyl red negative, Urease produced (almost instantaneous), Oxidase positive (strong), Glucose – non fermenter, *oxidative-fermentative* (alkaline in oxidative tube), motile on motility media and hanging drop test. The isolated organism was identified as *Bordetella bronchiseptica* by Vitek 2 compact system. The isolate showed resistance to all the antibiotics except Meropenem and Trimethoprim-sulphamethoxazole. The patient was put on I/V Meropenem to which she responded positively (Fig.3). No history of exposure to dogs or cats was seen.

**Conclusion**: Rare cases of *B.bronchiseptica* causing respiratory tract infections in humans are known. *B.bronchiseptica* is rare to cause wound/skin infection in humans. In severely immunocompromised patients, these rare organism can become opportunistic pathogens to cause severe wound infections and medical microbiologists should keep themselves updated in diagnosing such isolates.

**Fig 1:Colonies of *B.bronchiseptica* on Blood Agar**

**Fig 2:Colonies of *B.bronchiseptica* on MacConkey Agar**

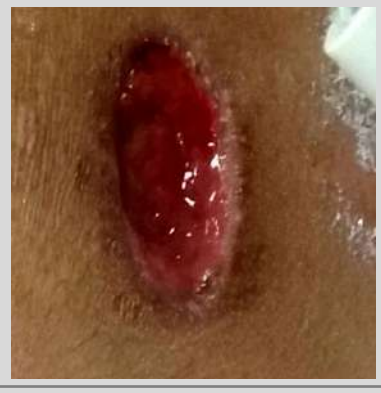

**Fig 3:Ulcer after few days of antibiotic treatment**

**Reference:**
**1:** Dworkin MS, Sullivan PS, Buskin SE, Harrington RD, Olliffe J, MacArthur RD, Lopez CE. Bordetella bronchiseptica infection in human immunodeficiency virus-infected patients. Clin Infect Dis. 1999 May;28(5):1095-1099.


**CME : Catheter Related Blood Stream Infections (held on 22/09/2018)**

- Dr Afzal Azim from SGPGI, Lucknow was the guest speaker
- Following this CME, ”Do’s & Dont’s” for Healthcare associated infections were made in collaboration with Department of Anaesthesia & Critical Care and they have been put up in all the ICUs

## Opportunistic infections in immunocompromised hosts with reference to Coccidian parasites

*Dr Haniya Jafar, Dr Manodeep Sen*

Coccidian parasites are ubiquitous and their infections are reported worldwide. Common opportunistic coccidian parasites are *Cryptosporidium*, *Isospora* and *Cyclospora*, which cause intestinal infections in immunocompromised patients. They are a major cause of morbidity and mortality. Poor sanitary conditions, poor nutrition, inadequate access to potable water are predisposing factors. Immunocompromised patients like those with AIDS defining illness, hematological malignancies, stem cell and solid organ transplant recipients, have impaired cellular immunity, impaired function of macrophages and decreased differentiation of B cells and cytolytic T lymphocytes (CD8 cells). These play a crucial role in determining length and severity of illness. Infection occurs through contaminated food and water as their oocysts are resistant to most water treatment protocols. Infection can be prevented by proper hand washing, avoiding contact with farm animals and drinking boiled water.

*Cryptosporidium hominis* and *C. parvum* are the most frequently detected in humans. Prevalence in India is reported to be 10-40 % in immunocompromised patients. Oocysts of *Cryptosporidium* spp are immediately infective when shed from the host. It causes life-threatening refractory diarrhea in immunocompromised patients and extraintestinal infections like respiratory cryptosporidiosis, cholecystitis, hepatitis, and pancreatitis. Oocysts in stool specimens are difficult to see without special staining techniques, such as modified acid-fast, auromine O stain. Histopathological diagnosis from intestinal biopsy specimen can be done. Direct fluorescent antibody tests and enzyme immunoassays have more than 95% sensitivity and specificity. Screening of immunocompromised patients with diarrhea is a reasonable approach for increased diagnosis. Studies show successful treatment with nitazoxanide, azithromycin, paramomycin and spiramycin.

*Cyclospora cayetanensis* is a human parasite. Ingestion of sporulated oocysts leads to infection. Prevalence in India in immunocompromised host is 2-14%. Patients develop flu-like illness with nausea, vomiting, anorexia, weight loss and explosive diarrhea lasting for 1 to 12 weeks. Unsporulated oocysts are passed in the stool, and sporulation takes about 20 days. In wet mounts it is seen as nonrefractile bodies. Modified acid-fast staining with 1% sulphuric acid as decolorizer shows deep red oocysts with a mottled appearance with no internal organization. Trimethroprim-sulfamethoxazole (TMP-SMX) is the drug of choice.

*Cytoisospora belli* is a human parasite which causes self limiting diarrhea in immunocompetant patients. Prevalence in India in immunocompromised patients is about 20%. Partially sporulated oocysts are shed in feces which sporulate in environment within 48 hours and become infective. Immunocompromised patients especially those with AIDS, present with profuse diarrhea, weakness, anorexia, and weight loss. TMP-SMX is the drug of choice.

**Table 1: Comparative morphology of *Cryptosporidium* spp, *Cyclospora cayetanensis*, and *Cystoisospora belli***

| | | | |
|---|---|---|---|
| ***Cryptosporidium spp*** | Oocysts: 4-6 um | Spherical, sporulated in stool (4 sporozoites) | Do not autofluoresce on UV microscopy |
| ***Cyclospora cayatenensis*** | Oocysts: 8-10 um | Spherical, unsporulated in stool | Oocysts wall autofluoresce with 450 to 490 nm excitation filter |
| ***Cytoisospora belli*** | Oocysts: 20-33 um | Ellipsoidal, unsporulated in stool (single sporoblast usually present) | Oocysts and sporoblast wall autofluoresce with 450 to 490 nm excitation filter |

**Live telecast of Webinar in Microbiology Seminar Room on World Sepsis day 13th September' 2018**

## Intestinal cryptosporidiosis in renal transplant recipient

*Dr Haniya Jafar, Dr Manodeep Sen*

**Introduction-** *Cryptosporidium* is a coccidian parasite that causes severe diarrheal disease in immunocompromised patients, especially renal organ transplant recipients[1]. In India, the reported prevalence of *Cryptosporidium* spp. in renal transplant patients is 20 %[2]. A high index of suspicion is required to diagnose cryptosporidiosis to prevent transplant dysfunction Here we describe a case of intestinal cryptosporidiosis in renal transplant patient.

**Case report**

A 31 year old male from Pratapgarh underwent allograft renal transplant in our hospital in October 2017. His intensive phase immunosuppressive therapy consisted of prednisolone (20 mg/day), tacrolimus (2mg/day), mycophenolate mofetil (1 gm/day) and immunoprophylaxis with valgancyclovir (450 mg/day) and cotrimoxazole. Baseline creatinine was 2.1 mg/dl. In November 2018, he was admitted here for diarrhea of 7 days duration. He had 6-7 episodes of non-bloody, watery diarrhea per day. There was no history of fever and pain in abdomen. On initial physical examination, the patient was afebrile and his vitals were stable. Chest, cardiac and abdominal examinations were within normal limits. Two days after admission he complained of dysphagia, pain in lower abdomen and fever. He was started on intravenous fluids, IV metronidazole and IV piperacillin/tazobactam. Laboratory tests showed WBC count 5250/ mm3, Serum Creatinine 4.86 mg/dl, procalcitonin 1.7 ng/ml. CMV DNA PCR was negative, blood culture was sterile. Stool culture showed growth of non pathogenic organisms. Stool routine microscopy showed oocysts of *Cryptosporidium* spp. Modified Ziehl-Neelson staining was done on concentrated stool sample and acid fast oocysts of *Cyrptosporidium* spp were seen. Diagnosis of intestinal cryptosporidiosis was made and patient was started on nitazoxanide (1 gm /day) for 14 days and azithromycin (500 mg/day) for 5 days. Maintenance immunosuppressive therapy was continued. Patient showed clinical improvement after 3 days of nitazoxanide therapy. Serum creatinine at discharge was 2.1 mg/dl.

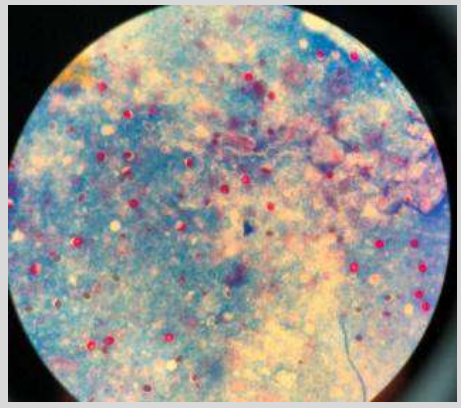

**Figure 1: Acid fast oocysts of *Cryptosporidium hominis/parvum* by modified Ziehl-Neelson stain (1000X)**

**Discussion-** Diagnosing cryptosporidiosis is challenging because diarrhea is a side effect of immunosuppressive therapy (esp. mycophenolate mofetil)[3, 4]. A strong suspicion of cryptosporidiosis must be kept in mind for renal transplant patients presenting with diarrhea.

**References**

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2. Udgiri N, Minz M, Kashyap R, Heer M, Gupta CS, Mohandas K, Minz RW, Malla N. Intestinal cryptosporidiasis in living related renal transplant recipients. InTransplantation proceedings 2004 Sep 1 (Vol. 36, No. 7, pp. 2128-2129). Elsevier.
3. Zumla A. Mandell, Douglas, and Bennett's principles and practice of infectious diseases. The Lancet Infectious Diseases. 2010 May 1;10(5):303-4.
4. Garcia LS. Diagnostic medical parasitology. American Society for Microbiology Press; 2006 Nov 29. 57-73

## VISITORS


**Dr. Shashikant Srivastava,** (Assistant Investigator, Center for Infectious Disease Research and Experimental Therapeutics, Bylor Research Institute, Dallas, Texas, USA) delivered a talk on PK/PD Optimised combination therapy for MDR-TB)

**Dr Ankita Garg** (Assistant Professor, Infectious Disease, College of Vetenery Medicine, University of Georgia, Athens, GA 3062 ) delivered a talk on Myeloid derived suppressor cells in people living with HIV

# Departmental Projects, Publications & awards in last one year

## *Ongoing Research Projects*

- **Project Title:** An assessment of changing pattern of seroepidemiology of Hepatitis A virus infection in endemic setting
  **Funded by**: Dr. RMLIMS for 2 years from June 2018
  **Principal Investigator: Prof. Jyotsna Agarwal**

- **Project Title:** A study on evaluation of serological methods with molecular methods in patients of clinically suspected leptospirosis at Lucknow
  **Funded by**: Dr. RMLIMS for 2 years from April 2017
  **Principal Investigator: Dr Vineeta Mittal** (Professor Junior Grade)

- **Project Title:** Evaluation of effect of radiation on oropharyngeal flora in patients with oropharyngeal cancer and its correlation with salivary metabolites : A Pilot Study
  **Funded by**: Dr. RMLIMS for 2 years from Feb 2019
  **Principal Investigator: Dr Manodeep Sen** (Professor Junior Grade)

- **Project Title:** Study on frequency of Dermatophyte in superficial mycotic infections and Nuclear Magnetic Resonance based identification of metabolites in Dermatophytes – at a tertiary care level super specialty institute in northern India
  **Funded by**: Dr. RMLIMS for 2 years from April 2017
  **Principal Investigator: Dr Anupam Das** (Associate Professor)

## *Completed Research Projects*

- **Project Title:** Immunological, genetic and behavioral profile of women with urinary tract infections by *E. coli*: role of host factors
  **Funded by**: DBT [BT/PR7936/SPD/11/1437/2013], completed in July 2018.
  **Principal Investigator: Prof. Jyotsna Agarwal**
- **Project Title:** Role of real time multiplex PCR in rapid diagnosis of community acquired acute bacterial meningitis in children
  **Funded by**: UPCST [CST/SERD/D-295], completed in August 2018.
  **Principal Investigator: Prof. Jyotsna Agarwal**

## Publications from the Department of Microbiology

1. Sen M, Singh V, Das A, Garg J, Pandey A, Agarwal J. Analysis Of Bacterial Cholangitis In Patients Attending Tertiary Health Care Centre In North India. Int J Microbiol Res. 2018; 10(6):1256-1258.
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## Awards/Recognition

- ***Prof. Jyotsna Agarwal*** was awarded First runner up in " **The Outstanding woman in Medical and Health care award**" category in 3rd FICCI Ladies Organization Women Awards of Uttar Pradesh 2017-2018
- ***Dr Vineeta Mittal*** was awarded "**President's Appreciation Award 2018"** by IMA Lucknow Branch in December 2018





**Celebrating World Hand Hygiene day on 5th May 2018**

Pic 2: Release of our Institute's Hand Hygiene Policy.

Pic 3: On wall are displayed the posters made by nursing students.

**Department of Microbiology : Faculty & Residents**

*Standing from bottom to top and from left to right:*

*Row 1 - Dr. Manodeep Sen, Dr. Jaya Garg, Dr. Vineeta Mittal, Prof. Jyotsna Agarwal, Dr. Anupam Das*

*Row 2 - Dr. Vikramjeet Singh, Dr. Sana Islahi, Dr. Akanksha Gupta, Dr. Meher Khan, Dr. Haniya Jafar (SRs)*

*Row 3 – Dr. Amit Kumar Singh, Dr. Shalini Trivedi, Dr. Kriti Maurya, Dr. Peetam Singh (JR-II)*

*Row 4 - Dr. Ashish Verma, Dr.Apurva Rautela, Dr. Manorama Yadav, Dr. Vaishali Jyoti, Dr. Pranshu Pandey (JR-I)*

# Departmental Celebrations


Holi, 2018

Diwali, 2018

Teacher's day, 2018



New year, 2019

## Congratulations

Department of Microbiology wishes Happy married life to Dr. Vikramjeet Singh (married to Dr. Sakshi Gautam) and Dr. Shalini Trivedi (married to Dr. Puneet Shukla)

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