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BHS HIGHER EDUCATION SOCIETY

VIJAYA COLLEGE

R V ROAD, BASAVANAGUDI, BANGALORE - 560 004

(ACCREDITED BY NAAC WITH 'B' GRADE &
RECOGNIZED BY UGC AS CPE)

EMAIL ID :

principal@vijayacollege.ac.in

Microbiology workshop

Department of Microbiology

Vijaya College, R.V. Road

Date: 5th & 6th February, 2019

Aiming to provide an intense knowledge on the topic "SYNTHESIS OF BIO-NANOPARTICLES AND THEIR ANTICANCER ACTIVITY" a two day workshop and Hands On Training programme was conducted on 5th and 6th of February 2019 by the department of Microbiology, Vijaya College, R.V. Road in collaboration with Team MakeIntern, E-cell event IIT-Kharagpur. Team MakeIntern is an official Training partner of Ecell event IIT-Kharagpur who has started an initiative for Awareness in Microbiology and Bio-Science Field and to provide students an Industrial Exposure through workshops. MakeIntern has selected 30 Zonal Centers to conduct the workshop and Vijaya College Microbiology department has been selected as one such centre.

The workshop is a part of competition supposed to hold in National level. The competition consists of 2 rounds.

First round venue: selected Colleges to conduct workshop and to select 5 top students from each college.

Finale Round Venue: Finale round would be held at ECELL EVENT INDIAN INSTITUTE OF TECHNOLOGY KHARAGPUR **where** selected students from 1st round will represent their college in an Intercollegiate competition and students will be awarded with medals, trophies, merit certificates. **The benefits for such activities are:** The College will become the official training center with Makeintern and Ecell-IIT-Kharagpur event.

The resource persons for the workshop were Dr. Bharath and Dr. Charles, Research Associate, St. John's research institute Bengaluru. There were totally 72 participants in the workshop. The



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main objective of the workshop was to make the participants to learn about the new avenues for nanoparticles and also to explore opportunities for cancer prevention by using various nanoparticles.

DAY-1

1st day session was quite interactive. The trainers began the session by sharing few interesting facts and scope about the steel used in MRI scanning machine, Damascus steel sword of Tippu sultan and long lasting 'MAYA BLUE' paints produced and used during Mayan civilization.

The first half of the session comprised of a presentation which illustrated the following topics:

- Special features of nanoparticles.
- Behaviour of substances at nano-scale: Thermal Properties, Conductivity, Energy Bonding Pattern, Electrical Properties, Surface Area, Catalytic Property and Quantum Confinement Effect.
- Classification of nanoparticles: Based on size, metal used and dendrimers.
- Properties and applications of: Quantum Dots, Dendrimers, Fullerenes or Bulky Balls, Nano-Fibres, Nano-Wires, Nano-Flakes Etc.
- Methods of synthesis of nanoparticles: (1) Bottom Up Method- Sputtering, Laser Ablation Method, Electrolytic Deposition, Sol Gel And Microinjection Method etc (2) Top down method- Ball Milling, Cutting, Grinding, Etching, Melt Mixing, Lithographic, Coprecipitation, Thermal Decomposition, Hydrothermal Method etc.
- Biological methods: a) From microorganisms- *Pseudomonas stutzeri*(silver), *Fusarium*(silver), *Lactobacillus casei* (selenium), Magneto bacteria(iron) etc.
b) From plants (Green Synthesis of Nanoparticles)



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c) From DNA, enzymes and S-layers: example-salmon sperm (cadmium nanoparticles).

In post lunch session was hand on training where they made all the participants to prepare iron and silver nanoparticles by following a standard protocol. The iron nanoparticles were prepared chemically and silver nanoparticles were synthesized biologically. Iron nanoparticles were mixed with yeast suspension and the movement of iron nanoparticles under a compound microscope (45x) using a strong magnet to confirm that the extracted particles were iron. *Vinca rosea* leaves, curry leaves, lemon leaves and betel leaves which are very commonly available in house holds were used to reduce the nanoparticles from their silver salt forms to metal form. The obtained nanoparticles were stored in HCl and were incubated for its activation. Meanwhile the hydrogel (a polymer which melts at 37^o-40^oC i.e the body temperature) which is required to absorb the anticancer drugs was prepared. And the previously activated nanoparticles coated with a polymer and an anticancer drug DOXARUBICIN were added into the breast cancer cell-lines and were incubated for 24 hours. And with this the 1st day session was ended.

DAY-2

The first half of the second day of the workshop started with a presentation which contained the detailed information about the characterisation of nanoparticles using various methods as follows:

- Transmission Electron Microscope(TEM)
- Scanning Tunnel Electron Microscope(STEM)
- Dynamic Light Scattering(DLS)
- Small Angle X-Ray Scattering (SAXS)
- Atomic Force Microscopy
- UV-Visible Spectroscopy

And also about functionalization of nanoparticles.



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In the second half of the session the breast cancer cell-lines which were incubated with activated nanoparticles coated with an anticancer drug were stained using Trypan Blue dye and were observed and count the live and dead cells on haemocytometer. The dead cancer cells were stained blue.

Valedictory function was held in the indoor auditorium in the presence of college Principal Prof H.S.Balakrishna, former HOD of Botany and Microbiology Dr. R. K. Chandranatha .The certificates were distributed to all the participants of the workshop. The top five who were selected from the test which was held by the Team make intern, E-cell event IIT-Kharagpur were felicitated and were given an opportunity to participate in the next level which will be held in IIT-Kharagpur.

Students were highly satisfied with techniques they have learnt and they express their heartfelt gratitude to Department of Microbiology. They also thank immensely Dr.Bharath and Dr.Charles for being so enduring and help the students to learn all about the nanoparticles and their applications in cancer therapy within the span of 2 days.

E-Cell 2K18-19 recognized Vijaya College as Zonal Centre and gave Certificate of Excellence. The Department of Microbiology is thankful to Higher authorities and Principal of college to support the program. The Department is look forward to bring many such workshops in future for benefit of students.



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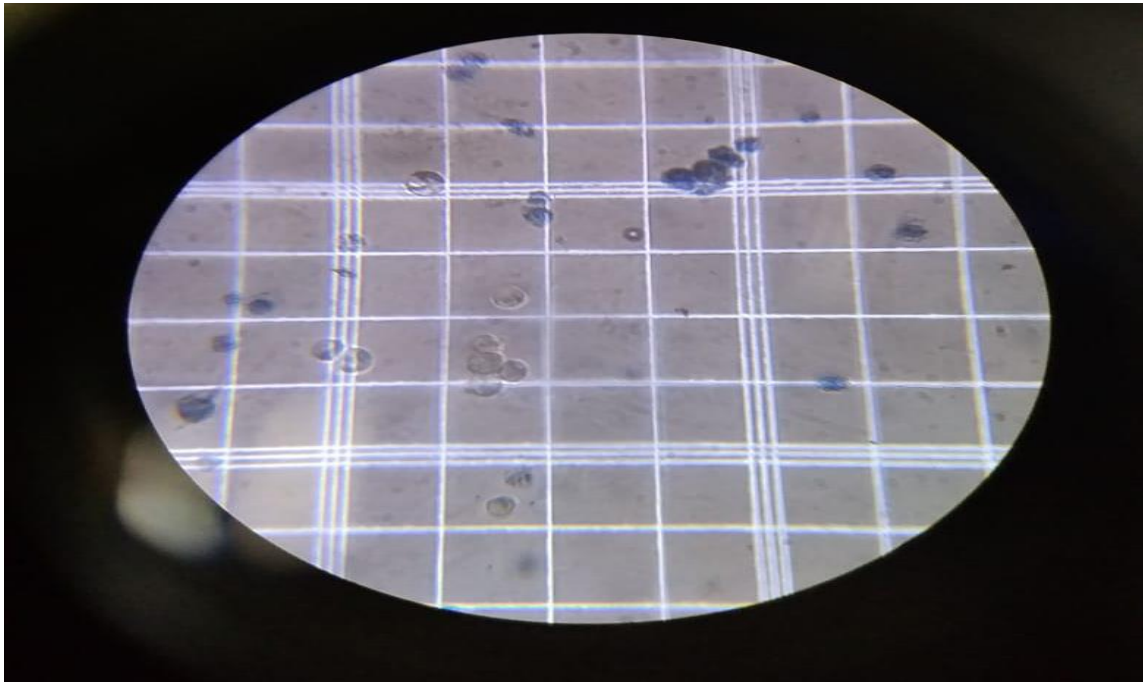
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Cancer cells after treated with Nanoparticles



Participants in Workshop



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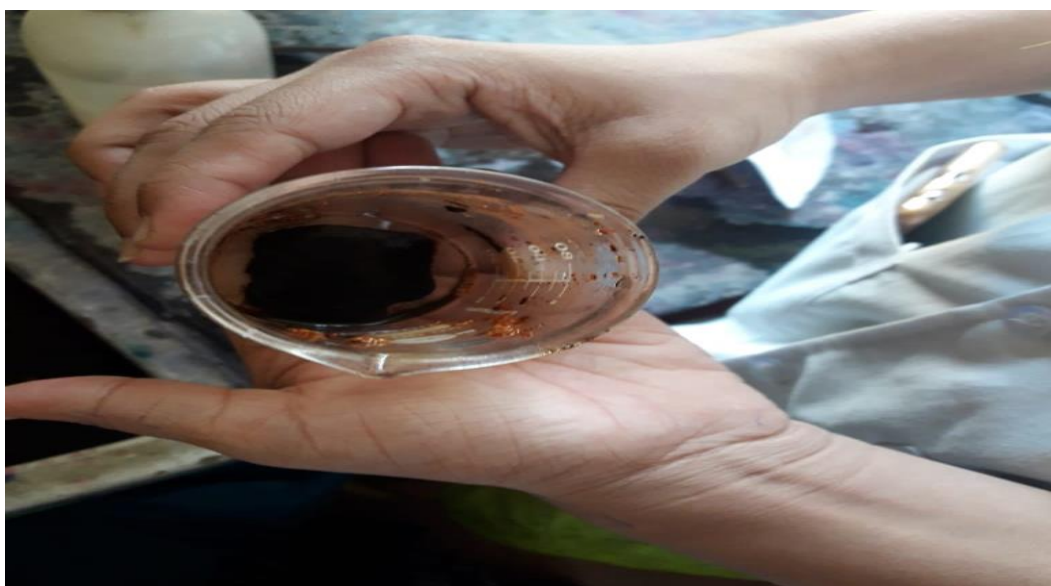
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With Resource Persons



Synthesized Iron Nanoparticles



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Department of Microbiology
Workshop - "Biosynthesis of Nanoparticles
and their Anticancer Activity"

VI SEM

IV SEM

II SEM

5th to 6th Feb 20

StudentName
AMRIN FATHIMA A
AMRUTHA D
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MADALA
HONEYSHREE
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VIKAS K S

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UTTARA R
RAKSHITHA R
SAHANA H S
SANJAY B G RAO
SHREYAS L
SAVANTH
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SREEVIDHYA S
SYED TAJ
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NITHIN B
PRAVEEN A
PRIYANKA KAMMAR D
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SHRAVANI A S
SHRAVANI M
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SINDHU PRIYA M
SMITHA B S
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VARUN K
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TAHIA IRFAN X

6/2/2019