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# BIOTECH EXPRESS

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Pair of nanotech researchers from India up to at least two dozen retractions

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# Editorial

# *Report on BRSI XV Annual Convention - BioSD-2018 and CSIR-IICT Platinum Jubilee Celebration: A Gathering of Leaders of Indian Science*

by Kamal Pratap Singh

The BRSI's flagship annual event was conducted in Hyderabad, this year event has gathered arounf 750 participants from all over the world and every corner of India who communicated their research among peers. We are bringing out this report in a special article as privilege because Biotech Express is Lifetime Media Partner of this India's prestigious BioScience society.

This four-day International Conference on "Biotechnological Research and Innovation for Sustainable Development (BioSD-2018) was held during November 22-25, 2018 at CSIR-Indian Institute for Chemical Technology (IICT) in association with The Biotech Research Society, India (BRSI) and In-

ternational Bioprocessing Association- An International Forum on Industrial Bioprocesses (IBA-IF-IBiop). A total of 750 participants attended the conference from all over the world, which included invited speakers from India, Australia, Bangladesh, Belgium, Canada, China, Germany, France, Italy, Japan, Hongkong, South Korea, Mexico, Nepal, Netherlands, Portugal, South Africa, Spain, Taiwan, Thailand, UK, USA.

The conference was held at CSIR-IICT, Hyderabad, India from 22nd to 25th November 2018. BioSD-2018 witnessed galaxy of renowned scientists, faculties, entrepreneurs from various industries and academicians/researchers.The scientific program of the conference comprised plenary and invited speakers and contributory short oral presentation, young researcher rapid presentations and poster presentations.

Photo: Prof Venkat Mohan S lightning the lamps

**BioSd-2018 inaugural took place on 22nd Nov 2018 at 3:00 pm. The conference convenor Dr S. Venkata Mohan welcomed the guests on to the dais, which included Dr. Shekar C Mande, Director-General, CSIR; Prof T P Singh, INSA Senior Scientist, AIIMS and President, BRSI; Dr. S. Chandrashekhar, Director, CSIR-IICT; Prof. Ashok Pandey, BioSD Chair and Dr N V Satyanarayana, CSIR IICT, Hyderabad.**

Photo: Attendees during National Anthem

Dr Chandrashekhar and Prof Singh welcome the audience. Prof Pandey gave a brief account of BRSI and its activities. Dr N V Satyanarayana gave a brief account of IICT activities in the area of Biotechnology. Dr. Shekhar C Mande delivered the inaugural address. In his speech, he acknowledged the accomplishments and the valuable commitment of CSIR in the areas of IT, Space and Agriculture for national benefits. He mentioned that Biotech industries in India were nurtured under the leadership of CSIR. He released the conference souvenir. Then Dr Mande was felicitated by Dr Chandrashekhar and Prof Singh.

Photo: Prof S C Mande

The second day of the BioSD-2018 showcased first lectures from award winners, followed by plenary lectures. After lunch, sessions were spread in four parallel streams, namely, energy and environmental Biotechnology (EEB), Algae biology, biotechnology and Business (ABBB) and Industrial biotechnology (IB) and Food, Agriculture and Medical Biotechnology (FAMB), in which invited speakers and contributory speakers presented their works. Total around 150 reaerchers presented their work through Oral presentations in all field of Biological Sciences and interdisciplinary Sciences. The work presented was of high standard and resulted in some good ideas sharing, according to some researchers presented over there.

# Honorary Fellow Award- Professor Alok Dhawan

BHU Centennial Award - Dr Rakesh Kumar
Dr Rakesh Kumar is currently Director of National Environment Engineering Research Institute, Nagpur.

Fellow - Prof Pratyoosh Shukla
Professor Pratyoosh Shukla is currently Head, Department of Microbiology at Maharshi Dayanand University, Rohtak, India.

BRSI annual awards were announced and conferred at this occasion. The session was coordinated by Dr Rajeev Kumar Sukumaran and Dr K Madhavan Nampoothiri from CSIR-NIIST, Trivandrum on behalf of BRSI. Delegates were informed that BRSI annually recognizes the active researchers as well as academicians and industry personnel for their outstanding contributions and offers awards in several categories. Awards were awarded into 11 categories.

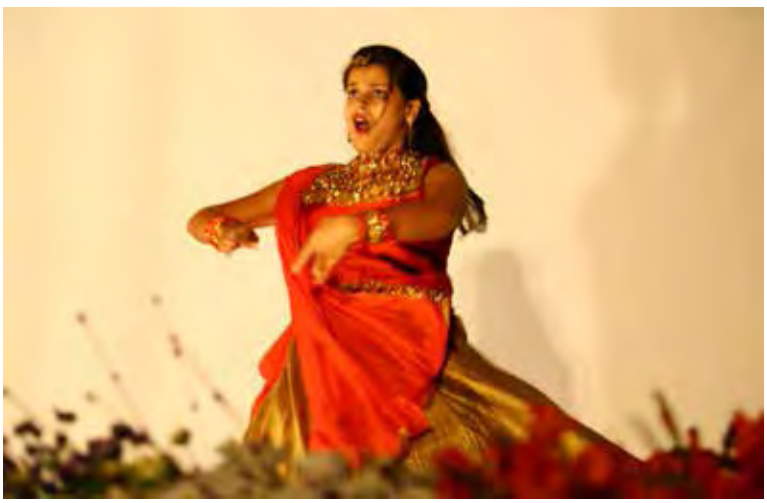
Tea Party of Lead Scientists:
In Photo: (L-R) **Dr. S. Chandrashekhar, Director, CSIR-IICT; Prof Alok Dhawan, Director, CSIR-IITR; Prof Rakesh Kumar Mishra, Director CSIR-CCMB: Dr. Shekhar C. Mande, DG-CSIR and Secretary DSIR, Director, NCCS; Professor Amit Ghosh, NICED, Kolkata; Prof T P Singh, AIIMS, Prof. Ashok Pandey, IITR, BioSD Chair, Prof Rakesh Kumar Mishra, Director, CSIR-NEERI(extreme right)**


**Exhibitors and Sponsors of BioSD 2018. Platinum Sponsor was**

**Elixir Technologies.**

**There was a special session for Exhibition where researchers could get knowledge of recent products of their research needs.**

The scientific sessions on the 2nd day of conference were concluded with a refreshing and a special cultural programme in the evening by Ananda Bharatha Natyalaya, Khammam and Siri Dance Academy, Hyderabad, Telangana, in which a special performance was made by Ms Priyam Pandey on cinematic Kathak dance.



There were two poster sessions on 23rd and 24th Nov 2018. Total of 360 posters were exhibited under several themes related to environment, medicinal and industrial biotechnology on 23rd and 24th Nov 2018. Several independent experts from various with whom posters presenters interacted. A special session was dedicated for young researchers to present their works as an oral talk (Rapid presentation) done in 4 minutes during the third day of conference (24th Nov 2018), in which 60 presentations were made. This forum appeared a useful platform for young researchers to present and learn various scientific concepts.

On the last day of conference, a session was dedicated for interaction between Industry and Young Researchers, which discussed about the research that can be translated to industrial scale and the opportunities in the field of biotechnology and environment. During the session, there was an active discussion on "Education, Entrepreneurship and Skill Development vis-à-vis Business of Biotechnology and Sustainability". Dr Raghavendra Gaikaiwari from Hi- Tech Biosciences, Pune was session chairman and moderator. Panelists included Dr Sangeeta Srivastava, Dr Onkar Tiwari and Dr PremKumar.

BioSD-2018 concluded with valedictory function by giving away the awards for best poster presenters and young researcher presenters. Three poster awards were sponsored by Shree Lok Bahadur Khanal Education Foundation, Nepal (courtesy: Prof Samir Khanal, USA), which included a certificate and Rs 3000. Prof Duu Jong Lee, Prof Rajeshwar Dayal Tyagi, Prof Ashok Pandey, Dr S Venkata Mohan, Dr. N.V.Satyanarayana and Dr. Rajeev Sukumaran were present and gave away the awards.

On this occasion, as part of CSIR-IICT 'green' initiatives, one tree was planted in name of each registered delegate (in various location in India, with the help of an plantation company). All the delegates were provided a certificate to this effect.

For students and young scientists, a scientific writing workshop was also organized on 22nd Nov 2018 by Dr Eldon Rene from IHE Delft, the Netherlands in which 30 delegates participated. To encourage the young researchers and to train on how to enhance the scientific writing was the main motto behind the organization of this workshop. The feedback from the participants showed it to be very useful and encouraging to augment the scientific writing skills for young researchers and students from several universities around the globe.

## *Testimonials of Awardees and Attendees*

***BioSD 2018 was seamless, well-organized, scientifically enriching and a truly international event. This conference is one of the best biotechnology events one can attend in India. What's more commendable is the post-conference communications and follow-up which does not happen in most conferences. Look forward to future conferences of BRSI.***

**Rishiram Ramanan,** Ph.D. Assistant Professor, Department of Environmental Science School of Earth Science Systems, Central University of Kerala,

***"I had a fantastic experience attending and actively participation in a well-organized conference. Timely managed, engaging knowledgeable sessions motivated the booming researchers. I am eagerly looking forward to the upcoming season."- SYEDA WARISUL FATIMA (SRF:IIT-DELHI, Selected for Young Researchers Rapid Presentation (YRP).***

Syeda Warisul Fatima, Research Scholar, Indian Institute of Technology Delhi

***BRSI conferences have been very special because they offer a chance to present our work and get to know work done by others in the related biotechnology areas, interact with fellow scientists that will help in getting cooperation and developing collaborations. The conferences are also attended by scientists from abroad; this will allow Indian Scientists to identify those with whom joint projects could be proposed.***

Prof. T. Satyanarayana, NSIT, New Delhi

I ***arrived in Hyderabad with great expectations from the BioSD conference. This was based on my previous experiences of attending the BRSI conferences in Pune and Tiruananthapuram. BioSD was even more special for me because it was being organized by Dr S Venkata Mohan, who is not only my collaborator but one of the leading researchers in my area of microbial electrochemical technologies. I must say, I am very happy with my overall experience at BioSD 2018. The quality of the science presented was top notch and there was a high level of interaction among the participants. All the sessions were very well attended and the young researchers showed great enthusiasm in networking with more established ones. I met several of my old friends, students, former colleagues and collaborators from India and other countries. The social program especially the cultural dance by the famous group from the region was excellent. I also took time to visit the labs at IICT and was very impressed with the research being carried out there. I congratulate Dr Mohan and his whole team at IICT for the excellent organization of BioSD 2018.***

Deepak Pant, Ph.D. Separation and Conversion Technology, Flemish Institute for Technological Research (VITO), Boeretang 200, Mol 2400, Belgium

# Biotech Event Report

## A report on International Conference on Bio-Innovation for Environmental and Health Sustainable Developments (BEHSD-2018), November 27-28, 2018; Lucknow, India

An international conference on Bio-Innovation for Environmental and Health Sustainable Developments (BEHSD-2018), November 27-28, 2018; Lucknow, India was organized by the CSIR-Indian Institute of Toxicology Research (CSIR-IITR), Lucknow, India in association with The Biotech Research Society, India. The venue was CSIR-IITR. A total of ~ 200 participants attended the conference from all over the world, which included invited speakers from India, Australia, Belgium, Canada, China, France, Italy, Hong Kong, South Korea, Netherlands, Portugal, South Africa, Spain, Sweden, Taiwan, Thailand, UK, USA. A total of five plenary talks and 40 invited talks were held in 10 parallel sessions held in two days along with 157 posters.

The opening session of the BEHSD-2018 was held at 9.00 am on 27th November 2018. Dr N Manickam, Convener, BE-HSD-2018 welcomed the dignitaries on the dais and also the delegates and special invitees. Prof Alok Dhawan, Director, CSIR-IITR, Lucknow welcomed the participants. In his address, Prof Dhawan emphasised the relevance of the theme of the conference and also briefly shared the relevant activities of the institute related to the conference theme. In his wel-

come address, Prof TP Singh, President, BRSI mentioned the growing global concern on the energy and environmental sustainability issues and linked them with the sustainability development goals set by the UN. He spoke about the role of BRSI in this concern and asked the delegates to discuss the burning global issues to address them. Prof Duu Jong Lee, President, International Bioprocessing Association (www.ifibiop.org), addressed the audience and mentioned about the collaboration between BRSI and IBA, which has led to development of several networks and collaboration between the partners. Prof RD Tyagi, University of Quebec, Canada was guest of honour. Prof Pandey also welcomed the invitees and delegates and spoke about the BRSI and its activities, especially about its skill development and entrepreneurship development programs.

The opening session was followed by Plenary lectures by Dr Anjan Ray, Director, CSIR-IIP, Dehradun and Prof Mohammad J. Taherzadeh, Director, Swedish Centre of Resource Recovery, University of Borås, Sweden. This was followed by coffee break; subsequently parallel sessions were run on different themes including Biological Waste Treatment, Lignocellulose Biorefinery, Environmental Bioengineering, Waste Biorefinery and Sustainability and Industrial Bioprocesses and Products in which several invited lectures were presented (also a few short contributoiry orals). At the end of day 1, a culture program was organized in which students from SMVD University, Katra (J&K) presented Kashmiri and Punjabi dances and also some songs. A special presentation was put by Ms Priyam Pandey, who performed two cinematic kathak dances. Couple of other dances were performed by the young kids of scientists of CSIR-IITR.

On 28th November 2018, there were three Plenary talks delivered by Prof Rekha Singhal, Institute of Chemical Technology, Mumbai, India, Prof Huu Hao Ngo, University of Technology Sydney, Australia and Prof RD Tyagi, University of Quebec, INRS, Quebec, Canada. This was followed by coffee break; subsequently parallel sessions were run on different themes including Environmental Bioengineering, Industrial & Food Technology and Toxicology, Waste to Wealth- Resource Recovery, – Nanotechnology – Applications in Food and Health Sectors in which several invited lectures were presented (also a few short contributoiry orals).

The closing session of the BEHSD-2018 was held at 4.00 pm on 28th November 2018 in which Dr Vivek Agarwal, CMD, CDC India, Jaipur was guest of honor. Winners of BEHSD poster awards and SLBK Foundation sponsored poster awards were announced and honored by Prof TP Singh and Dr Vievk Agarwal.

At the end, on behalf of BRSI, Prof Pandey thanks the CSIR-IITR, especially Prof Dhawan, Dr Manickam and Dr Parthasarathi for their efforts for the success of BEHSD-2018. He also thanked Prof Singh for his vision and stewardship in managing the BRSI. Dr Manickam thanked all in CSIR-IITR and in BRSI for the help rendered by all for the successful organization of BEHSD-2018.

## BEHSD-2018, Lucknow Posters Awards Winners

**Shree Lok Bahadur Khanal Memorial Education Foundation Awards (For female candidates only, Certificate + Rs 3000):**

• Ms Ranjana Sirohi, GB Pant University, Pantnagar; Application of Genetic Algorithm in modelling Optimization of Cellulase Production

• Ms Shipra Pandey, CSIR-National Botanical Research Institute, Lucknow; An Optimization of Physico-Chemical Conditions for Enhanced Catalytic Activity of Biogenic Gold Nanoparticles

**Session 1: Biological Waste Treatment**

• Ms Annapurna Maurya, CSIR-Indian Institute of Toxicology Research, Lucknow; Detection and quantification of biofilm-forming bacteria from sludge of CETP treating tannery wastewater

• Ms Rwiddhi Sarkhel, Jadavpur University, Kolkata; Biodegradation of Polymers by Bacteria isolated from marine environment

**Session 2: Environmental Bioengineering**

• Dr Sunita Varjani, Gujarat Pollution Control Board, Gandhinagar; Optimization of Fermentation condition for pullulan production by a new isolate of Micrococcus luteus

• Ms Juhi Gupta, Jawaharlal Nehru University, New Delhi; Production and characterization of extracellular polymeric substances (EPS) for the biodegradation of carbofuran by Cupriavidus sp. ISTL7

and few others among 8 sessions were awarded Poster awards at the closing ceremony of the event.

# Guest Article

# Plants prove to be efficient antifungal factories

by Joseph Wickman, Network of Valencian Universities for the promotion of Research, Development and Innovation

Researchers of the Institute of Plant Molecular and Cellular Biology (IBMCP), a mixed centre of the Valencia Polytechnic University (UPV) and the Spanish National Research Council (CSIC), in collaboration with the Centre of Agrigenomic Research (CRAG) of the CSIC, the government of Catalunya, the Authonomous University of Barcelona and the University of Barcelona; and the Institute of Food Agrochemistry and Technology (IATA) of the CSIC, have been able to efficiently produce antifungal proteins in plants, based on a modified tobacco mosaic virus. The results of this research, which could have a great impact in the agri-food industry, have been published in the *Plant Biotechnology Journal*.

The fungi that cause diseases in plants, animals and human beings represent a serious threat for health, food safety and ecosystems. Every year, more people die from fungal infections than from malaria. Furthermore, fungal infections can have fatal consequences for immunosuppressed patients from diseases such as HIV or chemotherapies used to treat cancer. Fungi also typically represent a challenge for food safety because they destroy the main crops on a worldwide level and also pollute human and animal foods with mycotoxins which are harmful for their consumers.

María Coca, researcher of the CSIC in the CRAG, explains that “we currently only have limited numbers of antifungal agent classes, and even these are not totally effective due to the hosts developing resistances and

Photo: Tobacco plant

the existence of potential undesirable secondary effects. This is why there is an urgent need to develop new antifungals that improve those that already exist and which may be applied in different fields, including crop protection, post-harvest, material and food preservation, and human and animal health."

CSIC researcher José Antonio Darós, who works at the IBMCP, adds that "in this project we have focused on the antifungal proteins secreted by filamentous fungi, which are small but highly stable proteins with strong specific activity against fungal pathogens, which could be used to develop new antifungal therapies in medicine and agriculture. The problem is that their use requires efficient, sustainable and safe production systems."

The researchers have used a modified virus based on the tobacco mosaic virus to produce these small antifungal proteins in *Nicotiana benthamiana*, a plant from the tobacco family which is often used in research. "With this method, we have been able to produce large amounts of antifungal proteins against the *Aspergillus giganteus* and *Penicillium digitatum* fungi. We have also verified that these antifungal proteins are totally active against these pathogens, and that a fluid which contains these proteins can protect the tomato plant from the *Botrytis cinérea* fungi, more commonly known as grey mould," conclude María Coca and José Antonio Darós.

The work of the IBMCP, CRAG and IATA researchers proves that plants can be used as antifungal protein biofactories for commercial purposes.

**Reference:**

Xiaoqing Shi, Teresa Cordero, Sandra Garrigues, Jose F. Marcos, José Antonio Darós y María Coca. ***Efficient production of antifungal proteins in plants using a new transient expression vector derived from tobacco mosaic virus.*** Plant Biotechnology Journal. DOI: 10.1111/PBI.13038

# Guest Article

# Plastic Waste Management by Microbial Degradation

Swatirani S Pandit[1] and Aparna B Gunjal[2]*

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[2]Asian Agri Food Consultancy Services Ltd, Pune 411001, Maharashtra, India

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Plastic is used in large number worldwide and its use has become part of our daily life for different purposes. Degradation of plastic wastes is serious problem which has created adverse effects on humans, animals, plants and environment. There are many processes available for the degradation of plastics, but the most eco-friendly and cheap method is by microbial degradation as the other process has hazardous effect on environment and also be costly. This study deals with the isolation, characterization and identification of plastic degrading bacteria and also study of the degradation of plastic waste by using individual bacterial isolates and also the consortium of bacterial isolates. Total 20 isolates were obtained from the Fursungi area, Pune, India. Four of the bacterial isolates were selected based on plastic degrading ability on different media. The isolates were identified as *Bacillus cereus, Serratia marcescens, Pseudomonas aeruginosa* and *Streptomyces s*p. based on morphological, physiological and biochemical characteristics. *Pseudomonas aeruginosa* and *Serratia marcescens* showed 15.78% degradation respectively, *Streptomyces* sp. showed 15.38% and *Bacillus cereus* showed 7.1% for the degradation period of 20 days. Consortium of the bacteria showed 43.75% of plastic degradation. From this it can be concluded, that the bacteria can be used for the plastic waste degradation. The use of bacteria for plastic waste degradation will be very eco-friendly and it will be a sustainable approach for the plastic waste degradation.

Keywords: Degradation, microbes, eco-friendly, sustainable, waste

## Introduction

Plastics are long chain of polymeric units[1]. These polymers are composed of carbon, silicon, oxygen, hydrogen, nitrogen, and chloride. The most common forms of plastics are viz., polyethylene, polypropylene, polystyrene etc. The usage of plastics has increased sharply from 1.5 million tons in 1950 to 299 million tons in 2013. The global plastic production is expected to be triple by 2050. Plastic wastes are approximately 16% of the municipal solid waste (MSW).

The plastic wastes, thrown on the sides of road, open areas, riverbanks, in drainage canals, and common places results in death and health problems of cattle. Besides, the intake of plastic items by the cows and buffaloes has shown reduction in the yield of milk[2]. The plastic wastes have become a serious threat to the aquatic life[3].

Plastic factories produce a great amount of green house gases which has lead to increase in global warming. Many plastics diffuse toxic pollutants to the atmosphere, and also burning of plastics generates toxic fumes. These toxics leak to the soil and groundwater causing contamination of soil and groundwater and due to this the growth of the plants is also affected.

Plastic contains chemicals that cause damage to the nervous system and immune system and some genetic diseases also along with tumors, birth defects, genetic mutations. Due to serious environmental issues, it is very necessary for the proper management and degradation of plastics.

The degradation of plastic by microbes is the most effective solution for the management of plastic waste. It has many advantages viz., eco-friendly, and also the microbial biomass is easily available in large amount.

The objective of the present work was to study the management of plastic by microbial degradation.

Materials and Methods

***Sample Collection***

The soil samples and plastics were collected from near Fursungi garbage depot, Pune, India in clean bags. The map of sampling area is shown in Fig. 1. The soil sample was stored in fridge until use.

***Enrichment, Isolation and Purification of Plastic Degrading Bacteria***

*Enrichment of Plastic Degrading Bacteria*

The nutrient agar media was used for the enrichment of plastic degrading bacteria. The soil sample (1 g) was suspended in 99 ml sterile saline. The sample was serially diluted in sterile saline. An aliquot (0.1 ml) of each dilution was inoculated separately onto nutrient agar (NA) media and incubated at 37°C for 3 days.

*Isolation, Purification and Maintenance of Isolates*

The sterile plates of Minimal Agar, Sabouraud Dextrose Agar (with 1% dextrose) and Sabouraud Agar without dextrose were prepared. The plastic cup was cut into rectangular strips, washed in absolute ethanol, and with the aid of sterile forceps, carefully placed on the agar plate such that the strips fit perfectly into petridishes. The isolates (0.1 ml) were inoculated onto the rectangular strips. The plates were incubated at 37°C for 3

days and observed for the clearance which indicated the plastic degradation ability. The positive isolates were subcultured on NA medium to purify and were maintained on slants at 4°C respectively.


Fig. 1 - Map of the sampling area.

## Characterization and Identification of Plastic Degrading Bacteria

All the positive isolates were subjected to morphological, physiological and biochemical characterization according to the Bergey's Manual of Determinative Bacteriology[4].

### Microbial Degradation of Plastic

Initially weighed strips of 2 × 2 cm size were aseptically transferred to the conical flask containing 50 ml of nutrient broth (NB) medium and inoculated with culture suspension (0.1 ml with cell density 1 x $10^7$ cells/ml). The conical flasks containing 50 ml of NB with plastic cups without inoculation served as control.

The consortium was also prepared to check for the plastic degrading ability (0.1 ml of each culture suspension). All the flasks were kept on a rotary shaker at 37°C for 20 days. The rectangular plastic cup strips were collected after 5, 10, 15 and 20 days respectively, washed thoroughly using distilled water, shade-dried and then weighed for final weight and percentage weight loss were calculated using below formula[5].

$$\text{Weight loss (\%)} = \frac{\text{Initial weight (mg) - Final weight (mg)}}{\text{Initial weight (mg)}} \times 100 \quad \text{(Eq.1.)}$$

## Results and Discussion

Isolation, Characterization and Identification of Plastic Degrading Bacteria

### *Morphological Characteristics*

The total 20 isolates were obtained from the soil, out of which four isolates designated as A1, A2, A8 and A13 were selected for the plastic degrading bacteria. The morphological characteristics are shown in Table 1. All the four isolates could tolerate 2.5% NaCl (Table 2), maximum growth was found at pH 5.0 and 7.0 (Table 3) and at 37°C (Table 4). The isolate A1 could ferment maltose and fructose, A2 was found to ferment glucose, sucrose and maltose (Table 5). The isolate A8 could ferment glucose and lactose and A13 was found to ferment only glucose. All the isolates showed nitrate reduction (Table 6) and were positive for oxidase test (Table 7). Based on the morphological, physiological and biochemical characteristics, the isolates A1, A2, A8 and A13 were found to be *Bacillus cereus, Serratia marcescens, Pseudomonas aeruginosa* and *Streptomyces s*p. respectively.

Table 1 - Morphological characteristics of the isolates on NA medium

| Characteristics | Isolates | | | |
|---|---|---|---|---|
| | A1 | A2 | A8 | A13 |
| size (mm) | 2 | 2 | 3 | 2 |
| shape | circular | circular | circular | circular |
| Color | white | pink with red pigment | bluish-green | grey |
| margin | entire | entire | undulate | entire |
| elevation | convex | umbonate | umbonate | convex |
| consistency | dry | moist | moist | dry |
| opacity | opaque | opaque | opaque | opaque |
| motility | motile | motile | motile | non motile |
| Gram nature | Gram – ve rod | Gram - ve rod | Gram - ve rod | Gram +ve |

### *Physiological Characteristics*

Table 2 - Growth in NB at varied salt concentration

| NaCl (%) | Growth of Isolates | | | |
|---|---|---|---|---|
| | A1 | A2 | A8 | A13 |
| 0.85 | + | + | + | + |
| 1.50 | + + | + + | + + | ++ |
| 2.50 | + + + | + + + | + + + | +++ |
| 3.00 | + + | + + | + + | ++ |
| 3.50 | + | + | + | + |

+, Good; ++, Better; +++, Best

Table 3 - Growth in NB at varied pH

| pH | Growth of Isolates | | | |
|---|---|---|---|---|
| | A1 | A2 | A8 | A13 |
| 2.0 | + | + | + | + |
| 3.0 | + | + | + | + |
| 3.5 | + + | + + | + + | ++ |
| 5.0 | + + + | + + + | + + + | +++ |
| 7.0 | + + + | + + + | + + + | +++ |

+, Good; ++, Better; +++, Best

Table 4 - Growth in NB at varied temperature

| Temp (°C) | Growth of Isolates | | | |
|---|---|---|---|---|
| | A1 | A2 | A8 | A13 |
| 15 | + | + | + | + |
| 28 | + | + | + | + |
| 37 | + + | + + + | + + + | +++ |
| 45 | + + | + + | + + | ++ |
| 50 | + | + | + | + |

+, Good; ++, Better; +++, Best

## *Biochemical Characteristics*

Table 5 - Fermentation of sugars

| Sugars | Isolates | | | |
|---|---|---|---|---|
| | A1 | A2 | A8 | A13 |
| Glucose | - | A+G | A+G | A+G |
| Sucrose | - | A+G | - | - |
| Maltose | A+G | A+G | - | - |
| Fructose | A+G | - | - | - |
| Lactose | - | - | A+G | - |

A, Acid; G, Gas; -, Negative

Table 6 - $H_2S$ formation, OF, Indole production, MR, Citrate utilization, VP and nitrate reduction tests

| Tests | Isolates | | | |
|---|---|---|---|---|
| | A1 | A2 | A8 | A13 |
| $H_2S$ formation | - | - | - | + |
| OF | Oxidative | Fermentative | Oxidative | Fermentative |
| Indole production | - | - | - | - |
| MR | + | - | + | + |
| Citrate utilization | - | + | + | + |
| VP | + | + | - | - |
| Nitrate reduction | + | + | + | + |

+, Positive; -, Negative; $H_2S$, Hydrogn sulphide, OF, Oxidative fermentative; MR, Methyl Red;

VP, Voges-Proskauer

***Production of enzymes***

Table 7 - Production of enzymes

| Enzymes | Isolates | | | |
|---|---|---|---|---|
| | A1 | A2 | A8 | A13 |
| Oxidase | - | - | + | - |
| Catalase | + | + | + | + |

+, Positive; -, Negative

## Microbial Degradation of the Plastics

*Pseudomonas aeruginosa* and *Serratia marcescens* showed 15.78% of plastic degradation each, which was highest among the four positive isolates, followed by *Streptomyces s*p. of 15.38% and least by *Bacillus cereus* i.e 7.1%. Consortium of the bacteria showed 43.75% of plastic degradation (Fig. 2).

According to this study, *Pseudomonas aeruginosa* showed high plastic degrading potential of 15.78%. There is a report where *Pseudomonas* sp. was able to degrade the plastic by 8.16% and polythene by 20.54% within one month incubation anaerobically[6].

There is a report on *Pseudomonas* and *Bacillus* sp. on indigenous beach sand bacteria for plastic degradation for 16 weeks incubation period which increased with increase in time[7]. Study has been done where *Pseudomonas* sp. showed high degrading capacity with 42.5% which was incubated for the period of 40 days[8].

There is a report where *Pseudomonas* and *Moraxella sp.* were most active in degrading 20.54% of polythene and 8.16% of plastics in one month period. *Aspergillus glaucus* was more active than *A. niger* in degrading 28.8% of polythene and 7.26% of plastics within a month[9].

The potency of degradation by *A. japonicas* is twice than that of *A. niger*. *A. japonicas* degraded 11.11% of LDPE per month, while *A. niger* degraded 5.8% per month[10].

The organisms which degrade the hydrocarbon in the plastics and used them as carbon source were *Pseudomonas spp., Xanthomonas spp., Flavobacterium spp., Micrococci, Streptococcus, Staphylococcus, Bacillus, Phanerochaete chyrosporium, Penicillium frequentans, Bacillus mycoides, Pseudomonas putida* VM15A*, Streptomyces spp., Aspergillus spp*[11].

There is a report where *Pseudomonas* sp. was capable of degrading more polythene compared to *Aspergillus niger*. *Pseudomonas* sp. and *Aspergillus niger* showed 26 and 23.33% of plastic degradation respectively[12].

## Conclusion

The bacteria isolated from the Fursungi area, Pune, India can be used for the degradation of plastic wastes. The microbial degradation of plastics will be very eco-friendly and also have sustainable approach.

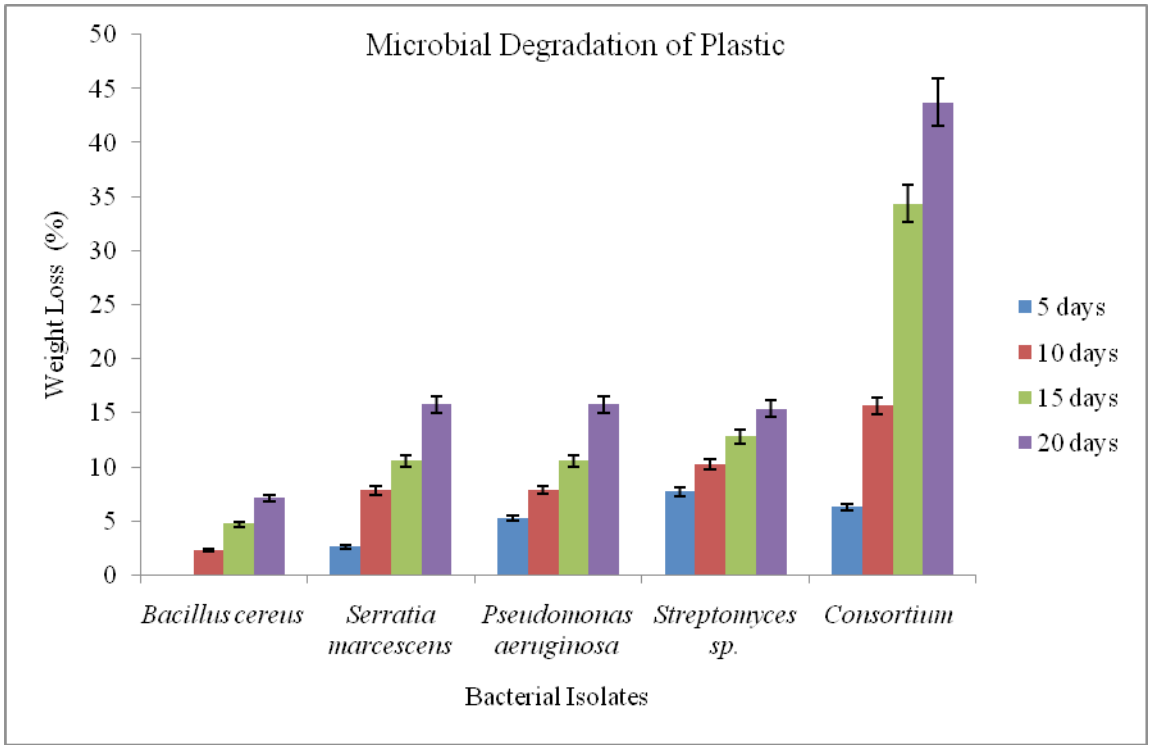


Fig. 2 - Degradation of plastic by the bacterial isolates.

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# Press Release

## The Indus Entrepreneurs (TiE) Hyderabad has announced the winners of TiE Hyderabad Agri-Biotech Startup pitch in a daylong event held recently at the PJTS Agricultural University.

by Phani Pattamatta , Executive Director, TiE Email: ed@tiehyderabad.org

A total of 27 startups applied for the event, out of which TiE shortlisted 13 startups for the investor pitch. After the final round, BODHA an innovative product startup from Amaravati, incubated in IKP knowledge Park, Karnataka is the clear WINNER. Followed by Hyderabad ventures, GoBhaarati incubated in Nutrihub of IIMR & UrbanKisaan incubated in NAARM A-Idea.

TiE-Hyderabad invited 13 startups from 27 applicants, to pitch to investors / entrepreneurs. In the final round 6 startups took part including the winners- BODHA, GoBhaarati, & UrbanKisaan were, CropIQ incubated at SRIX Warangal, Vectrogen Biologicals incubated at BioNest in University of Hyderabad, SiriCrops from FIK e-commerce.

TiE Hyderabad Agri-Biotech Startup Demo Day jointly hosted by FABA (Federation of Asian Biotech Associations) had University of Hyderabad and other players from Agri-Biotech domain. This event brought together Agri-Biotech Technology Business Incubators & Accelerators from across the country to promote the 'Spirit of Entrepreneurship & Innovation' in the Agricultural sector.

Winner BODHA took away One Full Year TiE Associate Membership fee, completely waived-off. The business models presented also attracted potential partnership interest by incubators, customers, and investors present at the daylong event. The platform provided good opportunities for the participating startups to pursue these connects further to convert into meaningful opportunities for their startup growth.

The eminent jury panel comprised of Venkatadri Bobba General Partner at Ventureast and TiE Hyderabad Charter Members, AVN Reddy, CMD of Roshini Crops, Dr. Balaji Bhyravabhatla, MD of Hylasco Bio and Srinivasa Satti MD of Finvista Advisors. We are very grateful for your support and enthusiasm all through the event.

# 6th AIST International Imaging Workshop

## January 20-27, 2019

**Biomedical Research Institute (https://unit.aist.go.jp/bmd/en/)**
**National Institute of Advanced Industrial Science & Technology (AIST)**
**1-1-1 Higashi, Tsukuba Science City 305 8566, Japan**

The AIST International Imaging Workshop is a residential one-week course held at the Biomedical Research Institute, AIST offering a wide range (from the principles of light microscopy to super resolution imaging) of microscopy training to young talented researchers. Participants will be trained through hands-on practical sessions in several critical and important issues related to imaging technologies.

### Who can join?

The course is suitable for both beginners and experienced users wanting to gain a greater understanding of the microscope. Students are selected through recommendation from their supervisor internationally from a range of backgrounds. Preference will be given to doctoral level students. The course will have a maximum of 20 delegates.


### Language?

The course, including the course materials, will be conducted in English.

### Support?

Selected candidates will be provided (1) Airfare (return) by economy class through the most direct route from the international airport in their home country to Japan, (2) Limousine fare (return) from Narita International Airport to Tsukuba Center, (3) Single room accommodation at the AIST Guest House and (4) Allowance to cover the daily meals.

### Course Details

**Laboratory Course 1**: Basic training in Microscopy
*Anatomy of the light microscope, Basic optics, Lenses, Bright field, Phase contrast, DIC, Fluorescence, Fluorochromes and Filters, Fluorescence imaging, Basic microscope maintenance*

**Laboratory Course 2**: Basic training in Laser Scanning Microscopy
*Learn the basic technique for a confocal microscopy, including spectral imaging, photo-activation, calcium imaging etc.*

**Laboratory Course 3:** Training in the latest microscopic analysis
*Learn the principle and techniques of recently-developed novel microscopic technologies, such as Super-resolution Microscopy, FCS analysis, Electron Microscopy, and so on..*

**Laboratory Course 4**: Training in Bioluminescence Screening & Imaging
*Learn the principle and techniques in high throughput screening & cell imaging based on bioluminescence technology*

### Program

**January 20 -** *Arrival, Reception & Networking*

**January 21 -** *Orientation; Lectures on Basic Principles of Microscopy*

**January 22 -** Course 1: *Basic Training in Microscopy*

**January 23~25 -** Course 2: *LSM*
Course 3: *Latest Microscopic Analyses*
Course 4: *Bioluminescence Screening & Imaging*

**January 26 -** *Tour to Microscope Companies in Tokyo & Around*

**January 27 -** *Departure*

**Instructors:** Y. Ohmiya, K. Katoh, T. Ebihara, T. Ochiishi, Y. Sasaki, K. Kiyosue, T. Tomita, Y. Shinkai, H. Inagaki, K. Ogawa and M. Doi

**Organizers:** Y. Ohmiya, R. Wadhwa, Y. Onishi, M. Doi and S. Kaul

**Sponsors:** Nikon, ATTO, Hamamatsu Photonics, Olympus and Zeiss

**Deadline for application - September 15, 2018**

*For further information:*
*s-kaul@aist.go.jp*

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# Press Release

# UoH-BioNEST and Tech Mahindra signed MoU for Technology Collaboration

**by Biotech Express Bureau**

Tech Mahindra Pvt. Ltd. a leading provider of digital transformation, consulting, and business reengineering services and solutions in Life Sciences and allied areas signed MoU with the UoH-BioNEST, a bio-incubator at the University of Hyderabad (UoH). The MoU was signed in presence of the Prof. Podile Appa Rao, Vice Chancellor, University of Hyderabad, Prof. Gandham Prasad, Director, TIE-U, Prof. Pallu Reddanna, Project investigator, UoH-BioNEST, Mr. Kandimalla Venugopal, Global Head Healthcare and Life Sciences, Tech Mahindra, Dr. Palakodeti, Ratnakar, Head Life sciences and Healthcare, Tech Mahindra, and other dignitaries.

"UoH-BioNEST is unique in having located within the School of Life Sciences, one of the largest in the country with 65 faculty members, 400 Ph.D scholars and post docs and 350 Masters students, engaged in teaching, research and extension activities in divergent areas of life sciences", says Prof. P Reddanna, Principal Investigator, UoH-BioNEST.

Prof. Podile Appa Rao, considers this memorandum of understanding between UoH-BioNEST and Tech Mahindra will bring high-motivation among young entrepreneurs, and hoped for better translational outcomes through the culmination of information technology and artificial intelligence to the Life Sciences arena.

Tech Mahindra will be the Technology Partner for the start-ups incubating in the UoH-BioNEST centre, and, thereby provides opportunity for joint Go-to-Market with the incubatees. It will also allows development of new technology platforms along with the incubatees at the UoH-BioNEST, fostering the biotech innovation ecosystem in Hyderabad region.

Tech Mahindra has delivered excellence in Healthcare and Life Sciences ecosystem; "we have a comprehensive understanding of research, innovation in biotechnology space towards bringing the latest technologies to the fore and commercialize the concepts to solutions" affirms Venugopal Kandimalla, Global Head-Healthcare & Life Sciences. As a technology partner of UoH-BioNEST, Tech Mahindra shall assist in providing all the technology support for the incubates within the center. Dr. P Ratnakar, Head- Life sciences explains that this perfect blend of Scientific Research and Technology stimulates the growth of the new process and products for the

Global Pharmaceutical and Biotech markets. This partnership will strengthen the new innovations required for the Life Sciences ecosystem.

## About UoH-BioNEST

UoH-BioNEST at University of Hyderabad is a bio-incubator set-up spanning in about 20,000 SQFT area with the support of the Biotechnology Industry Research Assistance Council (BIRAC), a Government of India Enterprise under Dept. of Biotechnology. UoH-BioNEST is an institutional activity promoting entrepreneurship in start-ups, students, researchers and faculty in the area of life sciences including biotechnology, pharmaceuticals, healthcare, and allied areas.

## About Tech Mahindra

Tech Mahindra represents the connected world, offering innovative and customer-centric information technology experiences, enabling Enterprises, Associates and the Society to Rise™. It is a USD 4.9 billion company with 118,390+ professionals across 90 countries, helping over 930 global customers including Fortune 500 companies. Tech Mahindra is the highest ranked Non-U.S. company in the Forbes Global Digital 100 list (2018) and in the Forbes Fab 50 companies in Asia (2018). It is part of the USD 21 billion Mahindra Group that employs more than 200,000 people in over 100 countries.


ISAC
International Society for Advancement of Cytometry

# 20th INDO-US FLOW CYTOMETRY SYMPOSIUM CUM WORKSHOP

on

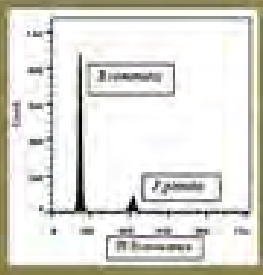
# "Applications of Flow Cytometry in Biotechnology"

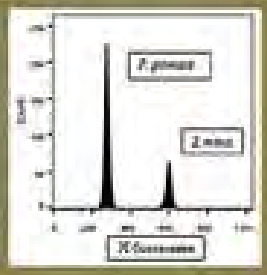
**13th to 16th March, 2019**

*Indian Institute of Technology Guwahati, Assam, INDIA*

## INVITED SPEAKERS

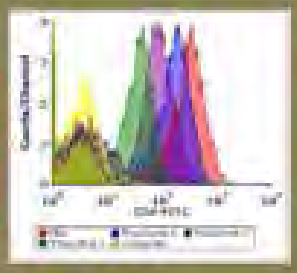
1. *Prof. Awtar Krishan, USA*
2. *Prof. Paul Wallace, USA*
3. *Dr. Zosia Maciorowski, France*
4. *Dr. William G. Telford, USA*
5. *Dr. Vivek Tanavde, India*
6. *Dr. H. Krishnamurthy, India*
7. *Dr. Paresh Jain, Singapore*
8. *Dr. Rekha Gour, India*
9. *Dr. Hemant Agrawal, India*
10. *Dr. Supriyo Basak, China*





## LECTURES AND WET LAB ON

1. *Basics of Flow Cytometry*
2. *Build Your Own Cytometer*
3. *Cell Cycle, Proliferation, Apoptosis*
4. *Polychromatic Flow Cytometry*
5. *Stem Cell Analysis*
6. *Quality Control in Flow Cytometry*
7. *Plant DNA Analysis*
8. *Data Analysis and Presentation*
9. *Quiz*



## ELIGIBILITY

Interested Graduate students, post-docs and other researchers from academia and industry. Accepted abstract will be judged for oral presentation and poster awards.

## REGISTRATION

- Online registration can be done through www.iitg.ac.in/biotech/indo_us_flow_cytometry_2019/index.php or else offline registration can be done by downloading the registration form and sending it to cyto2019@gmail.com with abstract on or before *15th Dec, 2018*.
- Selected candidates will be informed by *31st Dec, 2018*.
- Selected candidates will pay registration fee (both online and offline registration) before *15th Jan, 2019*.
- Fees details: Rs. 10,000 (symposium and workshop: 13th-16th March), Rs. 3,000 (symposium only: 13th-14th March), Rs. 8000 (workshop only: 15th-16th March) .
- Registration fee includes tuition, lab reagents for demo experiments, study material and lunch.

## ORGANIZERS

*Prof. Awtar Krishan*
*Prof. Latha Rangan*

## CONTACT

*03612583203*
*03612582214*

**Oral and Poster Awards**

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*Department of Biosciences and Bioengineering, IIT Guwahati*

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# NEWS: Govt & Industry

## Department of Biotechnology (DBT), Ministry of Science and Technology, Government of India held its XII Indian MedTech Summit on December 8, 2018

Department of Biotechnology (DBT), Ministry of Science and Technology, Government of India held its XII Indian MedTech Summit on December 8, 2018. This annual event is organized by DBT under its flagship programme-School of International Biodesign implemented at AIIMS and IITD in collaboration with International Partners with techno-legal management by BCIL.

The summit witnessed licensing of two medical device technologies coming out from SIB viz. CPR device technology transferred to M/S RcupeLifesciencesPvt. Ltd., Bangalore and Haemorrhoid Treatment Device (ShortLiv) to M/s Slicic Innova, Bangalore by Bio-

tech Consortium India Limited (BCIL) on behalf of DBT for further development and commercialization. These novel patent protected technologies licensed during the summit aim to address a market size of more than $100 million in India and about $ 1 billion globally. Prof Paul congratulated DBT for licensing of technologies and taking technologies from R&D stage to translation and commercialisation. The graduation ceremony of 2018 batch fellows was also held during the MedTech Summit.

The summit was highly successful and was attended by senior representatives from Government organizations, academia, medical device industry, start-ups, hospitals, and International organizations from Australia, Canada, Finland, Germany, India, Japan and Singapore. Dignitaries from Government of India included Dr Vinod Paul, Member Niti Ayog, Dr Renu Swarup, Secretary DBT, Dr, Balram Bhargava, DG-ICMR.

Dr. Renu Swarup during her key note address apprised the participants about the various initiatives of DBT for nurturing innovation ecosystem in the country including SIB as its flagship Program. She highlighted that one of the critical components of this ecosystem is funding for which a number of new schemes have been initiated by DBT-BIRAC to support and promote medtech innovators. She informed that DBT has launched National Biopharma mission as one of the majoe initiatives which is being launched by BIRAC. She further mentioned that DBT is committed to take forward these initiatives to ensure scalability and sustainability of this innovation ecosystem.

Dr Balram Bhargava, Secretary DHR & DG, ICMR, ED, SIB-AIIMS delivered special address covering Gandhian approach to healthcare systems as key principles which resonates with the mandate of SIB to foster development of unmet need based innovation and frugal medical device technologies for India.

Professor Vinod K. Paul, member, NitiAyog, Government of India, the Chief Guest for the Summit in his Inaugural Address congratulated DBT for initiating and spearheading SIB which is now considered as the epicentre for medical device innovation and product development in the medical device sector with demonstrated outputs having developed more than 50 medical device technologies, 21 licensed technologies more than 80 patents in India etc. Based on the success of SIB, Prof. Paul emphasized on initiating atleast 2 more such programs in a mission mode. He also approved various initiatives being undertaken by the government of India to boost 'Make-In-India' for medical device sector including BIS Certification, Ayushman Bharat, National Rural Health Program, Medical Device Zone such as AMTZ etc.

# Odisha launches Biotechnology Policy 2018

Bhubaneswar, Nov 15 Odisha on Thursday launched a Biotechnology Policy 2018 with the aim of providing attractive incentives to stakeholders to invest in the state. "We assure investors full support of the state government for the whole life cycle of the project. By collaborative efforts, between the state government and private stakeholders, we aim to make Odisha a top biotech investment destination in the country," said Science and Technology Minister Badri Narayan Patra at the ongoing Make in Odisha Conclave. He said the development of the biotechnology sector in Odisha will be based on three key pillars - innovation, entrepreneurship and investment.

"We will provide our full support for the development of this sector by forming public-private partnerships, bio incubation centres and biotech finishing schools. We will collaborate with various international organizations to provide cutting-edge technology in the biotech sector," the Minister said.

As per the policy, all biotechnology units shall be allotted land at a concessional rate as per the Industrial Policy Resolution of the state government. Besides, an additional subsidy of 25 per cent shall be available to reputed anchor tenants.

"Biotechnology is one of the emerging technologies that has excellent potential to grow in Odisha. We have seen how IT has transformed the country and the world, biotech is another such emerging technology and we in Odisha should take full advantage of this sector," said Chief Secretary A.P. Padhi.

"Our new policy will take care of many matters and will support entry-level and later stage product development in the biotech sector in Odisha," he added.

Krishna Ella, founder of Bharat Biotech, expressed his intention of a Rs 500 crore investment in the biotechnology park near Bhubaneswar.

# AIIMS-led team develops sensitive tests for pulmonary, pleural TB

Tuberculosis claims two million lives each year globally. Early detection and treatment are crucial to prevent spread, outbreaks, and development of resistance. Scientists at the Translational Health Science and Technology Institute (THSTI) and All India Institute of Medical Sciences (AIIMS), New Delhi have jointly developed highly sensitive and rapid tests for detection of tuberculosis infection in lungs and surrounding membranes.

Conventional diagnostic tests use antibodies for detection of bacterial proteins in sputum samples. However, such tests suffer with limitations including batch-to-batch variability, limited shelf-life, and cost. To address these problems, the researchers have now developed two DNA aptamer-based tests — Aptamer Linked Immobilized Sorbent Assay (ALISA) and Electrochemical Sensor (ECS) for detection of a bacterial protein in the sputum.

Aptamers are DNA, RNA or peptide molecules that bind to specific molecular targets.They are known to bind the right target (which defines sensitivity) and at the same time rule out any non-specific binding to other targets (specificity). The performance of the newly developed tests was compared with antibody-based tests in 314 sputum samples. ALISA showed 92% sensitivity while the antibody-based method was 68% sensitive.

The research team used ALISA to detect a bacterial protein, HspX. This method, however, took five hours to yield results because it requires sputum immobilization which is time-consuming step. So the team made efforts to develop a simplified ECS test. In this, aptamer was immobilized with an electrode and upon binding to HspX in the sputum sample, a drop in the electrical signal was recorded.

The ECS test can be used for screening of samples in the field as it takes as less as 30 minutes to deliver results. It is highly sensitive and could detect HspX protein in 91% of the samples tested in this study. In addition, there is no need for sputum sample preparation which is a complex and time-consuming process.

"We aim to develop aptamers for detection of multiple bacterial proteins simultaneously which is expected to lead a more robust test," said Tarun Sharma, a member of the research team.

"The aptamer-based screening tests for pulmonary TB, pleural TB, and TB meningitis hold immense promise for a country like India, where the disease burden in high and primary health care is only a dream for many. The ECS platform could be used in a mobile screening van at the point-of-care," explained Jaya Tyagi, who led the research team AIIMS. "We hope that these tests are adopted by the TB programs in the country," she added.

The group used aptamer-based test also for detection of pleural TB, the second most prevalent form of extrapulmonary TB. Early diagnosis of pleural TB is limited by availability of a sensitive and rapid test. The performance of existing DNA-based tests varies widely due to low bacterial load in pleural fluid sample.

"There is no test for making a confirmed diagnosis of

pleural TB. Even WHO-endorsed Gene Xpert has a poor sensitivity of 22%. On the contrary, our aptamer-based test for pleural TB has showed 93% sensitivity and is cost-effective," explained SagarikaHaldar, a member of the research team, while speaking to India Science Wire.

The research teams were led by Dr. Jaya Tyagi (AIIMS), Dr. Tarun Sharma and Dr. Sagarika Haldar (THSTI) and included people from both the institutes. The pulmonary TB results were published in journal ACS Infectious Diseases and the pleural TB results were published in Analytical Biochemistry. The studies were funded by the Department of Biotechnology, Department of Science and Technology, and THSTI.

Source: (India Science Wire)

# List of Awardees of SwarnaJayanti Fellowships Scheme, India – 2017-18 in Life Sciences

D r. Girdhari Lal National Centre for Cell Science, Pune

D r. Chandrima Das - Saha Institute of Nuclear Physics, Kolkata

D r. Arun Kumar Shukla -Indian Institute of Technology-Kanpur, Kanpur

# Shanti Swarup Bhatnagar Prize (SSB) for Science and Technology 2017 in Biological Sciences

Dr Deepak Thankappan Nair, deepak@rcb.res.in
Regional Centre for Biotechnology, National Capital Region - Biotech Science Cluster, 3rd Milestone, Faridabad-Gurgaon Expressway, Faridabad

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# Gilead hired Roche Veteran Daniel O'Day as New CEO

Shares of Gilead Sciences are up about 2 percent in premarket trading after the company officially announced that long-time Roche veteran, Daniel O'Day, will assume the helm of the company as chairman and chief executive officer beginning March 1.

O'Day will take over the reins of the Foster City, Calif.-based company from John Milligan, who announced in July that he planned to step down from his role by the end of the year. Milligan served 28 years with the company and oversaw the development of a virtual cure for hepatitis C with Harvoni and Sovaldi, as well as the development of significant treatments for HIV. Also, under Milligan's leadership, Gilead Sciences carved its way into the immuno-oncology space with the $12 billion acquisition of Kite Pharma and its CAR-T treatment.

O'Day currently serves as CEO of Roche Pharmaceuticals. He has been in that role since 2012. Prior to that, he led Roche Diagnostics. With his vast experience at the Swiss pharma giant, O'Day will be well-positioned to lead Gilead. In the interim between Milligan's departure and O'Day's joining the company, Greg Alton, the company's chief patent officer, will serve as interim-CEO.

John Martin, the chairman of Gilead's board of directors who is also stepping down, said that O'Day is uniquely qualified to lead Gilead. Pointing at O'Day's long career, Martin, who will step down from the

Board on March 1, said he has a track record of success in therapeutic areas, as well as a "deep understanding of the evolving healthcare environment around the world."

"Additionally, Dan brings expertise and values that are aligned with our organization, and I, along with Gilead's entire Board, am confident in his ability to work alongside our talented leadership team and deliver on our ambitious goals," Martin said of O'Day.

O'Day joined Roche in 1987 and has held leadership roles in multiple areas of the company. He will step down from the company at the end of the year, but will continue to assist Roche and Bill Anderson, the CEO of Genentech, a Roche subsidiary, who will take over as the head of Roche Pharmaceuticals in March.

While Gilead has a strong pipeline of drugs, one of the areas that O'Day will have to focus is on the company's CAR-T program, Yescarta (axicabtagene ciloleucel). Sales of the drug have been lower than the company would like, which is due to a number of reasons, including the risk of toxicity, cost and logistical issues regarding the process. However, O'Day has had a history of turning drugs into big sellers, The Wall Street Journal noted in its report about O'Day taking over. The Journal said O'Day has been involved with driving increased revenues from various oncology, hemophilia and multiple sclerosis drugs, including Ocrevus.

O'Day said he has been a long admirer of the work Gilead has done, particularly the way it has "fundamentally changed the way HIV and viral hepatitis are treated."

"The company has successfully grown into a global organization, providing access to people around the world, while maintaining its focus on innovative science. Together with the board, leadership team and Gilead's 11,000 employees, I look forward to building on this in ways that I believe will – in keeping with Gilead's mission – transform the lives of millions of individuals," O'Day said in a statement.

# Moderna Therapeutics Sets Record for Biggest Biotech IPO

The long-awaited and massively hyped initial public offering (IPO) of Moderna Therapeutics hit the market yesterday. The company sold approximately 26.3 million shares priced at $23 a share. This exceeded the revised goal of $600 million by about $4.3 million. Shares are trading on the Nasdaq under the "MRNA" ticker symbol.

The raise values the company at about $7.5 billion.

The previous record was set two months ago by Allogene Therapeutics, when it raised $324 million at a $2.2 billion market cap. Other top biotech IPOs included Axovant Sciences, which raised $315 million in 2015, giving it a $1.5 billion initial market cap, and Galapagos NV, which raised $275 million in an IPO in 2015, with an initial market cap of $1.7 billion. And a year before them, in 2014, Juno Therapeutics raised $264 million in its IPO, with a $2.2 billion market cap. Celgene acquired Juno earlier this year for $9 billion.

Last week Moderna refiled with the Securities and Exchange Commission (SEC), raising its goal for its initial public offering from $500 million to $600 million. The company, which has no products on the market, is fantastic at raising money, but some analysts wonder if the company is overvalued. Since its founding in 2010, Moderna has raised more than $2.6 billion in equity financing. As of September 30, it had cash, cash equivalents, and investments of $1.2 billion.
The company focuses on messenger RNA (mRNA) therapeutics. mRNA's role is to transport genetic information from DNA to the ribosome, offering up the amino acid sequence of the eventual proteins the DNA is coding for. Moderna's tech platform is designed to engineer mRNA to deliver whatever protein codes they want the cells to produce, in effect, turning the cells themselves into vaccine or drug-manufacturing factories.

Moderna has a development pipeline of 21 programs.

Ten are in the clinic and another three have open Investigational New Drug (INDs) submissions. Nine of those in the clinic are in Phase I and one is in Phase II, according to a July corporate update.

Although there is some skepticism as to whether Moderna can live up to expectations, it is unusual in the size of its pipeline. Most biotechs either have no products in the clinic when they launch an IPO, or they have one or two in early-stage trials and the funding is largely designed to help advance them into the clinic or more expensive late-stage trials.

Moderna's chief financial officer, Lorence Kim, told Xconomy earlier this year, "We're saying we can draw a picture that articulates an outsized return over time, and that outsized return comes from not one drug singly advancing by itself to approval, but instead by a technology that is pushed forward over time. The key thing for investors to wrap their arms around is: can we offer that sort of upside? We believe we can."

Not unusual in biotech IPOs, Moderna is probably years away from having a product on the market. Meanwhile, it has pretty high overhead with 680 staffers and a highly-compensated executive suite. Stephen Hoge, Moderna president, in 2017 received $19 million in options and a $4.4 million cash bonus. Kim received $5.5 million in stock and a $1 million cash bonus. And company chief executive officer Stephane Bancel received $4.6 million in options and a $1.5 million cash bonus. Those three accounted for a combined $40 million in cash and stock last year.

And in its latest SEC filings, it indicated it burned through almost $360 million in operating expenses in the first nine months of this year. It also stated it had accumulated a deficit of $865.2 million.

Bancel owned 10 percent of the company ahead of the IPO. He's the second-largest shareholder, behind Flagship Pioneering, which owned 19.5 percent prior to the IPO. AstraZeneca was the third-largest investor, with a pre-IPO stake of 8.4 percent.

The company has been secretive over its history, which it could be because it was privately owned. Now that it has gone public, it will face far more intense scrutiny. As most analysts note, and the company stated in its IPO filings, it's not clear if mRNA drug processes works or are safe. In addition, regulatory agencies such as the U.S. Food and Drug Administration (FDA) haven't evaluated these types of medicines, which makes the regulatory pathway uncertain.

In addition, Xconomy notes, although the company's most advanced program is for a form of heart disease, many of its other programs are vaccines, which have a notoriously lower margin than other types of pharmaceuticals.

As MarketWatch observes, "It's a high-risk, high-reward situation. Losses may never be recouped, as the company is years away from actual product sales. Moderna currently depends on revenue from grants and its collaborations with other companies."

BioSpace.com

# Takeda Sets a Date for Shareholders to Vote for the $62 Billion Acquisition of Shire

Pharma giant Takeda Pharmaceutical is looking to begin 2019 with a bang – closing its $62 billion acquisition of Shire plc by Jan. 8.

This morning Takeda announced that it will hold an investor vote next month on the planned acquisition in order to swiftly move and finalize the deal – if the company has the necessary support of its investors. Shares of Takeda are up slightly in premarket trading on the news of the plan, a nice show of support after the company stock dropped 2 percent on Friday. Takeda said it will hold an Extraordinary General Meeting of Shareholders on Dec, 5 to vote on the acquisition. In order to finalize the acquisition, Takeda will need to secure two-thirds support from shareholders.

Christophe Weber, Takeda's president and chief exec-

utive officer, said the acquisition of Shire is expected to accelerate the company's strategic transformation in order to create a "stronger, more global and more competitive company with the financial strength to continue investing in delivering highly innovative medicines and transformative care to patients around the world."

"With the date of our Extraordinary General Meeting of Shareholders now set, we are looking forward to continuing our dialogue with shareholders regarding the compelling strategic and financial benefits of this transaction," Weber said in a statement.

Also today, Shire published its scheme document related to the acquisition and plans to also hold a shareholders meeting on Dec. 5, following Takeda's EGM.

The $62 billion acquisition of Shire was first announced in May, two months after Takeda first expressed interest in the Dublin-based Shire. It took some time at the negotiation table for the two companies to come to an agreement, with a reported five different bids made by Takeda for Shire. When the deal was announced, Weber said Shire had a "highly complementary product portfolio and pipeline." He said the combined companies would be a leader in providing targeted treatments in gastroenterology, neuroscience, oncology, rare diseases and plasma-derived therapies.

There are some areas where the two company's pipelines will overlap. Takeda and Shire have held talks with European regulatory leaders regarding concern about the overlap in inflammatory bowel disease. Takeda said the agents specifically discussed Takeda's marketed product Entyvio and Shire's pipeline compound SHP647, which is currently in Phase III clinical trials. Takeda said it offered commitments to divest SHP647 and certain associated rights in exchange for the European Commission granting a Phase I conditional clearance for the acquisition of Shire. Takeda and Shire have secured approval for the deal from regulators in the United States, Japan, China and Brazil.

Shire's SHP647 may not be the only asset that could be sold. In September, Takeda was reportedly considering the sale of Shire's eye-care business in order to cut some debt incurred. If that occurred, Takeda could pick up a few billion dollars to help pay down debt.

Finalizing the acquisition won't be easy though, as there has been some opposition to the deal from within the ranks of the Takeda family. A group of shareholders, which has dubbed themselves Thinking about Takeda's Bright Future (TTBF), have been opposed to the deal. Kazu Takeda, one of the descendants of the founders of the 237-year-old Japanese company, has become the voice of TTBF.

Following the closing of the deal to acquire Shire, Takeda said it will continue to focus on the acceleration of its oncology business, following the 2017 acquisition of ARIAD Pharmaceuticals.

# 9 breakthrough Life Science Discoveries of the Year

#1. NASA astronaut Scott Kelly and his identical twin brother, Mark, became a year-long experiment in how space affects the human body. Scott spent a year on the international space station, while Mark spent the year on Earth. Among the many things they found, Scott was two inches taller after the year in space—gravity is merciless, apparently. But one of the more intriguing changes had to do with gene expression. Although Scott's height returned to "normal," the changes to his gene expression may never change all the way back, having been affected by the stresses of living in space. The researchers believe as much as 7 percent of Scott's DNA has changed permanently.

#2. Aimmune Therapeutics, headquartered in Brisbane, Calif., published the results of a successful Phase III PALISADE clinical trial of ARA101 that desensitizes patients with peanut allergies. It's estimated that 2.5 percent of all children in the U.S. might have a peanut allergy, and the incidence of peanut allergies in children has risen 21 percent since 2010. Aimmune's AR101 is 12 percent defatted peanut flour. Overall,

the compound did a good job of helping desensitize the patients, ages 4 through 17, to peanut protein, although there were adverse side effects in more than 95 percent of patients, almost all mild or moderate. However, 2.4 percent had severe adverse events and 1.1 percent experienced serious adverse events. Two patients required the use of epinephrine due to severe adverse events.

#3. The U.S. Food and Drug Administration (FDA) approved Eli Lilly's Emgality (galcanezumab-gnlm) for migraine prevention. Lilly was lagging behind Amgen and Novartis' Aimovig (erenumab-aooe) and Teva Pharmaceutical's Ajovy (fremanezumab) in this market. They are all a new class of drug that blocks the calcitonin gene-related peptide receptor (CGRP-R).

#4. Loxo Oncology and Bayer's Vitrakvi (larotrectinib), a first-of-its-kind TRK inhibitor, received FDA approval for solid tumors that have a neurotrophic receptor tyrosine kinase (NTRK) gene fusion. FDA Commissioner Scott Gottlieb stated, "This new site-agnostic oncology therapy isn't specific to a cancer arising in a particular body organ, such as breast or colon cancer. Its approval reflects advances in the use of biomarkers to guide drug development and the more targeted delivery of medicine."

#5. Researchers at The Chinese Academy of Sciences Institute of Neuroscience cloned monkeys using essentially the same techniques used to clone Dolly the sheep about 20 years ago. Cloning primates is extraordinarily difficult, requiring 127 eggs to produce two live macaques. Although it does break down a technical barrier to cloning human beings, the scientists say they don't intend to try cloning people.

#6. CRISPR babies. In what was both a big scientific story and a big story in general, He Jiankui, a researcher in Shenzhen, China, used CRISPR-Cas9 gene editing to alter the DNA of embryos for seven couples. All the males in the couples had under-control HIV infections. Jiankui used the technique to alter the CCR5 gene, which is purported to provide some immunity to HIV infection. A set of twins have been born and reportedly there is another pregnancy. This news was met by global condemnation that has launched investigations by the Chinese government, the U.S. National Institutes of Health (NIH), Rice University, where He Jiankui's associate, Michael Deem works—Deem reportedly helped in the procedures—and the Southern University of Science and Technology of China, to which He Jiankui is affiliated.

#7. Researchers at Flinders University in Australia, working with mice, removed a single gene known as RCAN1 and then fed them a variety of diets, including a high-fat diet. The mice did not gain weight, even after dramatically overeating high-fat foods over several weeks. The research was published in the journal EMBO Reports.

#8. Researchers with Yale University and the University of Oviedo in Spain sequenced the entire genome of Lonesome George, the last of the Pinta Island tortoises of the Galapagos. The last of his kind, George was more than one hundred years old.

Researchers published an article in the journal Nature Ecology & Evolution that described preliminary findings of gene variants in George associated with a strong immune system, efficient DNA repair and cancer resistance.

#9. Researchers have hunted for years to find a commonality across all cancers, a so-called "silver bullet" that ties them all together. Researchers from the University of Queensland's Australian Institute for Bioengineering and Nanotechnology (AIBN) have identified a nano-scaled DNA signature that seems to be common to all cancers. This has the potential to be used as an early cancer detection test, what is often called a liquid biopsy, and if the research pans out, could open up new pathways for universal cancer treatments.

# Biotech Events

## INTERNATIONAL CONFERENCE ON MEDICINAL, AROMATIC AND NUTRACEUTICAL PLANTS FROM MOUNTAINOUS AREAS

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# Three Days International Seminar on
# Current Avenues in Microbial & Plant Sciences
## CAMPS - 2019

*Organised by*

**Department of Botany, University of Gour Banga, Malda, West Bengal, INDIA**

**Date: 23 - 24 - 25 February, 2019 • Venue: University of Gour Banga Main Campus**

**UNIVERSITY OF GOUR BANGA:** The University of Gour Banga is one of the newly developed state universities, which has been established by the West Bengal Legislative Assembly vide West Bengal Act XXVI of 2007. UGB is a multi-disciplinary University with an aim for the quality research and teaching across the academic spectrum, with subjects spanning Sciences, Social Sciences, Humanities, Commerce, Computer Applications etc.

**ABOUT THE SEMINAR:** Following the inclusion of high throughput advance technologies, the current trends in modern Microbial and Plant Science research have been modified significantly. This international seminar aims to reassess the spirit of modern biology by covering all frontier topics, with special emphasis on - recent trends on plant and microbiological research. The seminar includes Plenary Lectures/ Keynote Lectures and invited talks by eminent personalities from India and abroad, jn addition to contributed papers both oral and poster.

**SECTIONS:**

1. Modern trends in plant and microbial systematics
2. Plant and Microbial genomics, proteomics, and metabolomics
3. Plants -microbes interaction: An inseparable interdependence
4. Abiotic and biotic stress responses in plants and microbes
5. Plant reproduction and Development
6. Reproductive biology studies in conservation and recovery of a species
7. Food security, safety and sustainability for the future
8. Trans-disciplinary approach in plant and microbial research

**CALL FOR PAPERS:** The participants for the seminar are invited to submit abstracts for oral or poster presentation. Kindly submit abstracts - between 200 to 250 words, with 4-6 key words and 5-10 references of your proposed presentation at the seminar website: *www.camps2019.org*. The abstract book will be published with ISBN.

**REGISTRATION FEE:**

Faculty / Scientists etc.: INR 3,000 /-
Post-Docs and Research Scholars (with fellowship): INR 2,500 /-
Post-Docs and Research Scholars (without fellowship): INR 2,000 /-*
B.Sc. / M.Sc. students: INR 1,200 /-
Accompanying Persons: INR 2,000 /-

*[Registration fee only covers - Conference kit, Breakfast, Lunch, Dinner and High Tea] *A certificate in prescribed format duly forwarded by the Supervisor and HoD should be submitted during registration. For Registration please visit seminar website.*

**IMPORTANT DATES:**

| | | |
|---|---|---|
| Opening of Seminar website | : | 31st October, 2018 |
| Abstract submission opening | : | 01st November, 2018 |
| Abstract submission closing | : | 31st December, 2018 |
| Early Registration ends | : | 31st December, 2018 |
| Late Registration up to | : | 31st January, 2019* |
| Acceptance notification | : | 05th February, 2019 |

**In case of late registration, participants have to pay INR 500/- extra (in addition to their registration fee).*

**CLIMATE DURING THE SEMINAR:** The climate of Malda during the Seminar will be cool and pleasant. Average Temperature: max 28°C and min 16°C. Dense fog with light rain. Light woollen clothes and umbrella is required.

**ACCOMMODATION:** Private lodges, hotels at reasonable rates and star category hotels are available near the campus of University of Gour Banga (Mokdumpur, Malda, NH 34). Delegates are requested to arrange their own accommodation as per their convenience earliest.


***For any query, please contact:***

**Dr. Abhijit Sarkar/ Dr. Sukanta Majumdar ✆: 9163614292/ 8768333983 ✉: abhijitbhu@gmail.com/ smajumdarwbes@gmail.com**


**Seminar Website: www.camps2019.org**

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**About Coimbatore**

Coimbatore (the Manchester of South India) situated at the foot hills of Nilgiris, it is popularly known for its pleasant climate, peaceful atmosphere, cosmopolitan outlook and private enterprises. Maruthamalai Temple, Kovai-Kutralam Waterfalls and Siruvani Dam, Isha Yoga centre, Annamalai Wildlife Sanctuary are the most famous tourist places in and around Coimbatore. Several well-known academic/research institutions (for instance TNAU/BU), marked industries and specialized hospitals are situated in and around the Manchester district.

**How to reach the KAHE**

The institution can be reached through road, flight and train.

by road, the institution is situated 10 kms from Coimbatore, on the junction of Coimbatore – Pollachi National Highway (NH – 209) & Coimbatore Bye-Pass road (NH 47), Tamil Nadu, India. Participants can also take bus from Gandipuram/Ukkadam/Coimbatore Junction (Bus route Numbers to reach Karpagam Academy of Higher Education - from Gandhipuram 84, 12; from Coimbatore junction 33; and all these buses would stop at Ukkadam.

by air, the nearest airport is Coimbatore International Airport. The institution is situated 15 kmsfrom the Coimbatore Airport.

by train, the nearest railway station is Coimbatore Junction. The Institution is located 10 kms from Coimbatore Railway Station.

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# Call for Abstracts

Abstracts are invited for oral and poster presentations at ICTPA-2019. All those desirous of participating and presenting their work in the conference are requested to create an account and upload their abstract(s) using online abstract submission portal (https://www.ictpa2019.in). Authors are requested to submit abstracts in the prescribed format available at the conference website. The themes listed on the page are representative research areas for abstract submission. The best oral and posters presentations will be selected for awards by the conference committee.

The 'abstracts text' for oral and poster presentations should be one paragraph in length, in Times New Roman, 12-point font, single-spaced, and limited to a maximum of 300 words, excluding keywords. There may be up to six keywords. In the title, capitalize only the first letter of the first word (sentence case) and any proper nouns, acronyms, etc. The title should be in bold with 12-point font, followed by authors name(s) on the next line, and affiliation(s) on the subsequent line(s) with centered alignment, followed by the Email of the corresponding author. The name and Email of the corresponding author should be marked with asterisk in superscript (*). Presenting author's name should be in all capital letters; all other author names should be in upper and lower case. Abstracts should be carefully prepared, in final form, with no grammatical, typographical, or factual errors. Abstracts should state the specific objective(s) of the study and the results with sufficient details to support conclusion(s). Do not include any graphics, references, tables or tabular material- in the body of the abstract.

# Accommodation

| Participants | Charges per day | |
|---|---|---|
| | **Single Occupancy** (Non-sharing) | **Double Occupancy** (Shared basis) |
| **Institute Guest House*** (For Delegates only) | ₹ 1800 ($35) | ₹ 1000 ($25) |
| **Campus Hostels** for Students (Boys/Girls) | ₹ 500 ($15) | |
| **Hotel**** (For participants and industry persons) | As per Hotel charges | |

**Please note:**

*Limited accommodations are available. Rooms will be allotted on a first-come, first-served basis and are subject to availability at the time of booking.

**Participants must book directly with their selected hotel. The list of hotels is available on our website.

***Accommodation charges for overseas participants (excluding SAARC member countries) are in Dollars

# Important Dates

| | | |
|---|---|---|
| FEBRUARY **14-16** 2019 | SEPTEMBER **01** 2018 | NOVEMBER **08** 2018 |
| **Conference Date** | **Abstract Submission & Registration Opens** | **Abstract Submission Ends** |
| NOVEMBER **15** 2018 | NOVEMBER **26** 2018 | DECEMBER **14** 2018 |
| **Decision on Abstracts** | **Early Bird Registration Payment Due** | **Late Registration Payment Due** |

Registration, Abstract submission and Payments are accepted ONLINE only. Please visit the website: **www.ictpa2019.in**

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# ICTPA 2019

## 40TH MEETING OF PLANT TISSUE CULTURE ASSOCIATION - INDIA (PTCA-I)

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**FEBRUARY 14 - 16, 2019**

*Organized by:*
Department of Biosciences & Bioengineering and Centre for Rural Technology, IIT Guwahati (IITG), India

*In association with:*
Plant Tissue Culture Association - India (PTCA-I)

# RESEARCH NEWS

## From other High Impact Journals

## 3D-printed glucose biosensor for use in wearable monitors

Using 3D printing, the WSU research team developed a glucose monitor with much better stability and sensitivity than those manufactured through traditional methods.

The researchers used a method called direct-ink-writing (DIW), that involves printing "inks" out of nozzles to create intricate and precise designs at tiny scales. The researchers printed out a nanoscale material that is electrically conductive to create flexible electrodes. The WSU team's technique allows a precise application of the material, resulting in a uniform surface and fewer defects, which increases the sensor's sensitivity. The researchers found that their 3D-printed sensors did better at picking up glucose signals than the traditionally produced electrodes.

Because it uses 3D printing, their system is also more customizable for the variety of people's biology. "3D printing can enable manufacturing of biosensors tailored specifically to individual patients" said Gozen.

Because the 3D printing uses only the amount of material needed, there is also less waste in the process than traditional manufacturing methods. "This can potentially bring down the cost," said Gozen. For large-scale use, the printed biosensors will need to be integrated with electronic components on a wearable platform. But, manufacturers could use the same 3D printer nozzles used for printing the sensors to print electronics and other components of a wearable medical device, helping to consolidate manufacturing processes and reduce costs even more, he added.

"Our 3-D printed glucose sensor will be used as wearable sensor for replacing painful finger pricking. Since this is a noninvasive, needleless technique for glucose monitoring, it will be easier for children's glucose monitoring," said Lin.

The team is now working to integrate the sensors into a packaged system that can be used as a wearable device for long-term glucose-monitoring.

**Journal Reference:**

Sepehr Nesaei, Yang Song, Yijia Wang, Xiaofan Ruan, Dan Du, Arda Gozen, Yuehe Lin. Micro additive manufacturing of glucose biosensors: A feasibility study. Analytica Chimica Acta, 2018; 1043: 142 DOI: 10.1016/j.aca.2018.09.012

## First significant risk loci for attention deficit/hyperactivity disorder

Researchers from the Psychiatric Genomics Consortium have compared genetic variation across the entire genome for over 20,000 people with ADHD and 35,000 who do not suffer from it -- finding twelve locations where people with a particular genetic variant have an increased risk of ADHD compared to those who do not have the variant.

The results of the study have just been published in

the scientific journal Nature Genetics.

"The large amount of data enabled us to find, for the first time, locations in the genome where people with ADHD stand out from those who are healthy. The search for such genetic risk variants for ADHD has spanned decades but without obtaining robust results. This time we really expanded the number of study subjects substantially, increasing the power to obtain conclusive results significantly. In particular, we included a large number from the Danish iPSYCH cohort representing more than 2/3 of the total international study sample," explains Associate Professor Ditte Demontis from Aarhus University.

She along with Raymond Walters of Massachusetts General Hospital are the lead authors of the study, working as part of the ADHD group of the Psychiatric Genomics Consortium, an international consortium of researchers dedicated to uncovering the genetics factors that give rise to ADHD.

These genetic discoveries provide new insights into the biology behind developing ADHD. For example, some of the genes have significance for how brain cells communicate with each other, while others are important for cognitive functions such as language and learning.

"Overall, the results show that the risk variants typically regulate how much a gene is expressed, and that the genes affected are primarily expressed in the brain," explains Professor Demontis.

In the study, the researchers have also compared the new results with those from a genetic study of continuous measures of ADHD behaviours in the general population. The researchers discovered that the same genetic variants that give rise to an ADHD diagnosis also affect inattention and impulsivity in the general population.

"The risk variants are thus widespread in the population. The more risk variants you have, the greater your tendency to have ADHD-like characteristics will be as well as your risk of developing ADHD," says Professor Anders Børglum from Aarhus University. He is research head at iPSYCH and one of the leading researchers who directed the study along with Professors Stephen Faraone of SUNY Upstate Medical University and Benjamin Neale of Massachusetts General Hospital and the Broad Institute.

"We also studied the genetic overlap with other diseases and traits. Through this we found a strong negative genetic correlation between ADHD and education. This means that on average genetic variants which increase the risk of ADHD also influence performance in the education system negatively for people in the general population who carry these variants without having ADHD," says Ditte Demontis.

Conversely, the study found a positive correlation between ADHD and obesity, increased BMI and type-2 diabetes, which is to say that variants that increase the risk of ADHD also increase the risk of overweight and type-2 diabetes in the population.

"These findings and results also underscore the importance of collaboration to advance discovery efforts. It is only through data sharing and working together that we were able to find these regions of the genome," explains Dr. Benjamin Neale.

**Journal Reference:**
Multi Scientist study, Discovery of the first genome-wide significant risk loci for attention deficit/hyperactivity disorder. Nature Genetics, 2018; DOI: 10.1038/s41588-018-0269-7

# Gut microbiome differs among ethnicities

Changing the gut microbiome to beat illness really does hold great potential, said Vanderbilt University biologist Seth Bordenstein, but first scientists must answer what constitutes a healthy gut microbiome and in whom. By studying data on nearly 1,700 Americans of varying genders, ages, weights and ethnicities, they learned that gut microbiome differences among ethnicities are the most consistent factor.

That discovery holds promise in the burgeoning field of individualized medicine, because it is far easier to change a person's microbiome than their genes -- the other major markers for disease. In addition, many chronic diseases disproportionately affect ethnic minorities, with underlying causes of that difference unexplained. Perhaps some answers lie in the gut microbiome.

The team discovered 12 particular types of bacteria that regularly vary in abundance by ethnicity. Because ethnicity captures many factors, ranging from diet to genetics, it's difficult to say why this is, said Andrew Brooks, the Vanderbilt doctoral student in the Vanderbilt Genetics Institute who analyzed data provided by the American Gut Project and Human Microbiome Project. But it's a baseline for understanding healthy microbiome differences among individuals.

"You may buy probiotics over the counter at a drugstore, but those are unlikely to affect your microbiome in a substantial way," Bordenstein said. "They often are at too low a dose, and they may not even be viable bacteria. Moreover, one size may not fit all. But with more of this kind of research, we can hone in on the relevant differences and doses of bacteria that may reverse illness or prevent it from developing in the first place."

The 12 bacteria featured in this research are:
Christensenellaceae
Clostridiales
Coriobacteriaceae
Dehalobacteriaceae
Odoribacter
Odoribacteriaceae
Peptococcaceae
RF39
Rikenellaceae
Veillonella
Verrucomicrobiaceae
Victivallaceae

**Journal Reference:**
Andrew W. Brooks, Sambhawa Priya, Ran Blekhman, Seth R. Bordenstein. Gut microbiota diversity across ethnicities in the United States. PLOS Biology, 2018; 16 (12): e2006842 DOI: 10.1371/journal.pbio.2006842

# Stem cell researchers develop promising technique to generate new muscle cells in lab

Darabi's team engineered a novel human stem cell line for skeletal muscle. To ensure the purity of the muscle stem cells, they tagged muscle genes (PAX7, MYF5) with two fluorescent proteins. "In order to improve the formation of the muscle from stem cells, we screened several bioactive compounds. We were also able to observe muscle stem cell activity in great detail using color tags," he said.

In the lab housed in the Brown Foundation Institute of Molecular Medicine for the Prevention of Human Diseases at UTHealth, the team used a gene-editing method called CRISPR/Cas9 to add the fluorescent tags to the genes. The stem cells were generated from a patient's skin cells and used to generate muscle. "Our current research provides a step-by-step roadmap to make muscle stem cells from these cells," Darabi said.

The team's "approach also allowed induction and purification of skeletal myogenic progenitors in a much shorter time course (2 weeks) with considerable in vitro and in vivo myogenic potential (myofiber engraftment and satellite cell seeding)," the authors wrote.
The modified stem cells produced promising results in a culture of human tissue, as well as in a mouse model of Duchenne muscular dystrophy. "In a side-by-side comparison with previous strategies, our strategy allowed faster and more efficient generation of muscle stem cells with superior engraftment in mice," Darabi said.

Darabi believes these muscle stem cells will initially be used by researchers to study the pathophysiology of muscular dystrophies, create disease models that scientists can use to test promising drugs, or evaluate gene correction efficiency.

**Journal Reference:**
Jianbo Wu, Nadine Matthias, Jonathan Lo, Jose L. Ortiz-Vitali, Annie W. Shieh, Sidney H. Wang, Radbod

Darabi. A Myogenic Double-Reporter Human Pluripotent Stem Cell Line Allows Prospective Isolation of Skeletal Muscle Progenitors. Cell Reports, 2018; 25 (7): 1966 DOI: 10.1016/j.celrep.2018.10.067

# Anversa cardiac stem cell lab earns 13 retractions

Two months after Harvard and the Brigham and Women's Hospital said they were requesting the retraction of more than 30 papers from a former cardiac stem cell lab there, two American Heart Association journals have retracted more than a dozen papers from the lab.

For example, here is the retraction notice for "Human Cardiac Stem Cell Differentiation Is Regulated by a Mircrine Mechanism," originally published in Circulation in 2011:

For the article "Human Cardiac Stem Cell Differentiation Is Regulated by a Mircrine Mechanism" (Circulation. 2011;123:1287–1296; DOI: 10.1161/CIRCULATIONAHA. 110.982918) by Toru Hosoda, Hanqiao Zheng, Mauricio Cabral-da-Silva, Fumihiro Sanada, Noriko Ide-Iwata, Barbara Ogórek, João Ferreira-Martins, Christian Arranto, Domenico D'Amario, Federica del Monte, Konrad Urbanek, David A. D'Alessandro, Robert E. Michler, Piero Anversa, Marcello Rota, Jan Kajstura, and Annarosa Leri, an investigation by Harvard Medical School and Brigham and Women's Hospital (BWH) has determined that there were issues with some of the data reported in the article, specifically Figure 7B. An expression of concern was published on November 20, 2018,1 to alert readers that the American Heart Association was communicating with the authors and reviewing the materials provided by BWH. After considering input from authors, the American Heart Association has determined that the best interest of the public and the research community will be served by issuing this notice of retraction.

The American Heart Association, therefore, retracts the article.

Anversa is not a co-author on one of the retracted papers, but it is from his lab, and two of the papers subject to expressions of concern have yet to be retracted.

The retractions come more than four and a half years after questions were first raised about work in Anversa's lab, a year and a half after the Brigham and Partners Healthcare paid $10 million to settle allegations of fraud in the lab's data, and weeks after the NIH paused a clinical trial based on the work.

Source: Retraction Watch

# Former Colorado "golden boy" earns three-year ban on Federal funding

The U.S. Office of Research Integrity has announced findings of misconduct against a once-promising pharmaceutical scientist at the University of Colorado.

The ORI says Rajendra Kadam fabricated data on government grants while working on his PhD at UC Denver under the supervision of Uday Kompella. As we reported in 2015 when this case first broke, Kadam was put in charge of a piece of technology that apparently he alone knew how to operate — giving him ample opportunity to cook results without fear of detection.

Under the terms of the ORI finding — which comes nearly four years after the UC inquiry wrapped up — Kadam will be barred from Federal U.S. research funding for three years, beginning November 13, 2018.

Asked why the ORI finding came so long after the university's report was submitted, the ORI said it had nothing to add to the Federal Register notice about the case, which has yet to appear. [See update.]

Also per the agreement, Kadam will request the re-

traction of a 2013 paper in Molecular Vision, "Suprachoroidal delivery in a rabbit ex vivo eye model: influence of drug properties, regional differences in delivery, and comparison with intravitreal and intracameral routes," which he published with Kompella and other co-authors.

By our count, if the article in Molecular Vision is retracted, Kadam will have eight retractions, two expressions of concern and a correction.

Kadam left UC Denver and wound up at a Pfizer subsidiary called InnoPharma, where this site lists him as manager of clinical pharmacology. The Pfizer switchboard told us it had a listing for Kadam's name, but not his telephone number. Kadam did not immediately respond to an email requesting comment on his case.

Update, 2100 UTC, 12/5/18: According to the now-posted Federal Register notice about this case, Kadam

engaged in research misconduct by knowingly and intentionally falsifying and/or fabricating data by manipulating LC-MS/MS peak area data to reduce variability and/or alter statistical significance for twenty-six (26) figures and five (5) tables in his Ph.D. thesis and in the following nine (9) published papers

Source: Retraction Watch

# Indiana University paper about lung transplantation retracted after misconduct finding

After a finding of data manipulation, the corresponding author of a 2014 paper by a team of researchers at Indiana University has retracted the work.

Here's the notice in Science Translational Medicine:

Science Translational Medicine is retracting the Research Article "The HMGB1-RAGE axis mediates traumatic brain injury-induced pulmonary dysfunction in lung transplantation" by Weber et al., following concerns raised by the corresponding author of the study about potential data manipulation. The Indiana University School of Medicine conducted an internal investigation, the result of which established that data had been manipulated in Figures 1, 2, and 3. Given the integrity of the manuscript is compromised, the corresponding author requested the Research Article be retracted.

The paper has been cited 26 times, according to Clarivate Analytics' Web of Science. In a statement to Retraction Watch, Indiana University said that it "conducted a comprehensive and thorough investigation" after "learning of questions regarding the integrity of data" cited in the paper:

As a result of the investigation committee's findings, the university requested that the publication be retracted. The misconduct involved laboratory research, and at no time were patients or research participants in danger. The laboratory involved has since closed.

The scientist in question completed training in 2017, prior to the investigation being completed, and is no longer affiliated with Indiana University or its partner hospital systems. Indiana University has notified the scientist's current academic institution of the investigation's findings.

Neither the retraction notice nor Indiana's statement specifies who was responsible for the misconduct. The lead author of the paper, Daniel J. Weber, finished his training at Indiana in 2017 and is now a cardiothoracic surgery fellow at the University of California, San Francisco. He did not respond to requests for comment.

The corresponding author, one of the paper's two senior authors, David Wilkes, became dean of the University of Virginia School of Medicine in 2015.

# Pair of nanotech researchers up to at least two dozen retractions

A pair of researchers at the Indian Institute of Technology (Indian School of Mines) has had a total of nine more papers retracted, pushing their totals to 24 and 26, respectively.

The totals put the two researchers — Rashmi Madhuri, with 24 retractions, and Prashant Sharma, with 26 — on our leaderboard of the 30 authors with the most retractions in the world.

Three of the retractions appeared in RSC Advances, two appeared in Journal of Materials Chemistry B, and one each appeared in Journal of Materials Chemistry A, Journal of Materials Chemistry C, Biomaterials Science, and CrystEngComm.

For example, here is the retraction notice from Journal of Materials Chemistry C:

The Royal Society of Chemistry hereby wholly retracts this Journal of Materials Chemistry C article due to concerns with the reliability of the data in the published article.

The TEM images in Fig. 1F and 2C contain duplications of the same particles within the images.

The FTIR spectra presented in Fig. 2B have been duplicated but it has been reported as different materials.

Fig. 7 contains duplicated images in different orientations.

The zeta potential plot data in Fig. S4 duplicates data that has been presented in other publications but reported as different materials.1–3

Given the number and significance of the concerns, the validity of the data and, therefore, the conclusions presented in this paper are no longer reliable.

The Royal Society of Chemistry apologises for the fact that these concerns were not identified during the peer review process.

Santanu Patra, Rashmi Madhuri and Prashant K. Sharma oppose the retraction. Raksha Choudhary and Ekta Roy were contacted but did not respond.

The story of Madhuri and Sharma's retractions began almost exactly a year ago, when PubPeer commenters noted obvious duplications in the pair's work. The numbers have grown since.

The Royal Society of Chemistry, which publishes the journals that retracted the nine papers, tells Retraction Watch:

The decision to retract is opposed by the authors, all of whom were contacted during the investigation process.

Our investigations concluded that in nine papers it was apparent that the data and conclusions could no longer be relied upon due to inappropriate altering of images and duplication of data, which have been presented in a number of journals, including with other publishers.

While we have apologised to our readers for the fact that these concerns were not identified during the peer review process, our author guidelines make it clear that researchers are expected to uphold standards of academic integrity.

Source: Retraction Watch

# NOTIFICATIONS

**Department of Biotechnology**
**Ministry of Science & Technology**
**Government of India**

**Indo-Australian Biotechnology Fund**

**CALL FOR PROPOSALS**
***(11th Round)***

Applications are invited for joint research projects to be implemented by Indian scientists in collaboration with the Australian counterparts. The priority areas of research for Round Eleven of the *Indo-Australian Biotechnology Fund* are:

1. **Plant genomics**

2. **Neurodegenerative diseases, including palliative care**

Call for proposal is open from **14th December, 2018 to 23rd January, 2019**.

On the Indian side, Applicants for funding should submit the completed application form Five (5) hard copies and a soft copy in a CD and one soft copy through single by e-mail) with all relevant, clearly labelled attachments to the following address:

Dr. Suraksha S. Diwan, Scientist 'E', Department of Biotechnology, Block-3, 5th Floor, **Room No. 517**, C.G.O. Complex, Lodi Road, New Delhi - 110003, e-mail: ssdiwan.dbt@nic.in

Please visit www.dbtindia.nic.in for detailed advertisement, guidelines and Application format.

## INDO-GERMAN SCIENCE & TECHNOLOGY CENTRE

Plot No. 102, Institutional Area, Sector - 44, Gurgaon - 122003, India

# IGSTC 2+2 Call 2018

**Indo-German Science & Technology Centre (IGSTC),** established by the Department of Science and Technology (DST), Government of India, and the Federal Ministry of Education and Research (BMBF), Government of Germany to promote research partnership of industrial relevance invites:

**First Stage Proposals** for joint R&D&I projects of industrial relevance in **2+2 Mode of Partnership** in the following thematic areas:

**1. Sustainable Production**

- Sustainable chemical process technologies**.**

**2. Clean and Green Technologies**

- Technologies to reduce / mitigate water and air pollution.
- Solid waste management technologies (electronic, electrical, biomedical, industrial and urban solid waste).

### Deadline for Submitting First Stage Proposals: 4th February 2019

Who can Apply

Applicants from public and private non-profit research organisations, public and private institutions of higher education, universities and public or private companies having R&D bases are eligible to submit an application. Principal investigators should be holding a regular/permanent position. Applications of SME´s are encouraged.

How to Apply

The Basic Guidelines and the First Stage Proposal format can be downloaded from the website www.igstc.org. The project proposal should be submitted online using pt-outline: https://ptoutline.eu/app/igstc_in-d18igcz1 latest by 4th February 2019.

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Department of Science and Technology (DST)
Ministry of Science and Technology
Government of India

# INDIA SCIENCE AND RESEARCH FELLOWSHIP (ISRF)


DEADLINE FOR RECEIVING APPLICATIONS: 31st January 2019

HOW TO APPLY:

Researchers/scientists actively engaged in research at a university or research institution meeting the eligibility criteria should apply using prescribed format (can be downloaded from the websites www.ccstds.tn.nic.in; www.dst.gov.in) to respective implementing agency in partner country (if available) or CCSTDS, Chennai.

# CSIR-CSIO

(Council of Scientific & Industrial Research)
Sector 30-C,
Chandigarh-160 030

Last date for Submission of Online Applications : 21.12.2018 (upto 5:00 PM)

A.Scientist - Rs. 67700-208700
M.E./M.Tech. (Bio engineering/Medical Science & Technology/Medical Imaging/Bio-informatics) or equivalent OR Ph.D(Engg.) thesis submitted in any of the above area
Working Knowledge of Processing of Bio signals/ Digital Signal Processing/Image Processing/Human Anatomy and Orthopedics. Job requires good knowledge of medical science and technology /Medicine/ Surgery

B. Senior Scientist - Rs. 78800-209200
M.E./M.Tech. (Bio engineering/Medical Science & Technology/Medical Imaging/Bio-informatics) or equivalent with 03 years' experience OR Ph.D(Engg.) in any of above the areas
Experience in Processing of Bio signals/ Digital Signal Processing/Image Processing/Human Anatomy and Orthopedics. Job requires good knowledge of medical science and technology /Medicine/Surgery

More Info: https://www.csio.res.in/Recruitment.php

# INDIAN NATIONAL SCIENCE ACADEMY (INSA)

**Bahadur Shah Zafar Marg, New Delhi-110 002, India**
**www.insaindia.res.in**

## CALL FOR VISITING SCIENTIST PROGRAMME 2019

INSA invites applications from scientists/faculty of less endowed institutions to conduct Research and Training in advanced research Institutions/Laboratories within India under **Visiting Scientist Programme 2019.** The main objective of the programme is to facilitate scientists/faculty enhance their research capabilities with training in specific techniques or through utilizing facilities not available in their own institution. The scientists/faculty holding a regular position in R&D Organizations including Universities or Affiliated Colleges in India are eligible to apply under the programme. The fellowship period varies from one month to six months depending upon the proposed work or purpose.

Application forms and other detailed information including eligibility criteria are available on the INSA website: **http://www.insaindia.res.in.** Complete application in the prescribed format endorsed by the Head of the Institution should reach **INSA**, Bahadur Shah Zafar Marg, New Delhi - 110002, latest by **31.12.2018.**

# RESEARCH SCIENTIST POSITION IN HUMAN STEM CELL BIOLOGY PROGRAM

Description: Research scientist positions are available in The Institute of Stem Cells and Regenerative Medicine (inStem) for candidates with substantial experience in cell culture techniques, microscopy and flow cytometry analysis. The appointments will be a fixed term position initially for a period of one (1) year that may be extended up to a maximum of two years depending on the performance of the candidate. The position comes with a consolidated pay based on their qualification and experience. Selected individuals will be required to travel to Denver, Colarodo for a short period of time.

Essential Qualification: Postgraduate degree in life sciences or a related discipline with a minimum of two years research experience in a laboratory experience.
Desirable: Ph.D in life sciences and/or experience in fluoresce microcopy or flow cytometry.
Salary: As per institute norms.
The position is available starting: January 1, 2019
Age Limit for the above position: Below 40 years

HOW TO APPLY: Interested applicants are requested to apply with their CV [with names and contact information (postal and email) of two scientific referees] and a statement of interest (~400 words) pertinent to the position applied for by 21st December, 2018. Applications may be sent to adbs@ncbs.res.in as one pdf file. Please mention the advertisement number in the subject line. Incomplete applications will be rejected. Shortlisted applicants will be called for an interview.

GOVERNMENT OF INDIA
DEPARTMENT OF BIOTECHNOLOGY
MINISTRY OF SCIENCE & TECHNOLOGY

## TATA INNOVATION FELLOWSHIP: 2018-19

The scheme is aimed at rewarding interdisciplinary work where major emphasis is on innovation and translational research with a potential towards commercialization in healthcare, agriculture and other areas related to life sciences and biotechnology.

NUMBER: Five per year.

**HOW TO APPLY:** Application (six copies) may be sent as per proforma downloadable from DBT website (www.dbtindia.nic.in) and duly forwarded by the competent authority to Dr. Kakali Dey Dasgupta, Scientist "E", Department of Biotechnology, Ministry of Science & Technology, Room No.814, 8th Floor, Block-2, CGO Complex, Lodhi Road, New Delhi -110 003, not later than December 31, 2018. The soft copy of application (single pdf document) also should be sent at tatadbt4@gmail.com

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