

## INSA MEDAL FOR YOUNG SCIENTISTS- 2020

1. **Dr Shalini Agarwal** (b 04.05.1985), PhD, School of Life Sciences, Jawaharlal Nehru University, New Delhi.

Dr. Shalini Agarwal is being recommended for the INSA Young Scientist Award 2020 for her consistently high-quality research on the biology of parasites that cause much morbidity and mortality – Plasmodium and Entamoeba. In both cases, her work has opened up new areas of research and provided novel targets for developing drugs against malaria and amoebiasis.

2. **Dr Waheed Ahmad** (b 19.03.1987), Ph.D, EPFL, Lausanne, Switzerland

INSA Medal for Young Scientist 2020 is given to Dr Waheed Ahmad for his excellent contribution to understand the mechanism of action of topoisomerase I (Topo I), *in vivo* roles and genome regulatory mechanism of topoisomerases highlighting the importance of supercoiling and topoisomerases in mycobacterial growth, metabolism, gene expression and physiology.

3. **Dr Vaishnavi Ananthanarayanan** (b 23.11.1986), PhD, BSSE, Indian Institute of Science, Bangalore.

For excellent/pioneering work on

Molecular cell biology of mitochondrial dynamics, distribution and inheritance in fission yeast, as well as for insights on microtubule anchoring at the cell cortex.

4. **Dr Mithu Baidya** (b 06.04.1986), PhD, BSBE Department, Indian Institute of Technology, Kanpur.

Dr. Mithu Baidya is being recommended for the INSA Young Scientist Award 2020 for his high quality biochemical and structural work on the regulation of G-protein coupled receptors (GPCRs) by beta-arrestins. With GPCRs being the target of many existing drugs, his work establishes a novel framework to fine-tune GPCR functions that might have promising therapeutic implications in the near future.

5. **Dr Aditya Bandopadhyay** (b 26.08.1989), PhD, Department of Mechanical Engineering, Indian Institute of Technology (IIT) Kharagpur.

For his theoretical study of electrokinetic transport at the micro and nano scales, and on electro-hydrodynamic phenomena at the macroscale.

6. **Dr Antara Arupkumar Banerjee** (b 18.06.1987), PhD, Division of Structural Biology, National Institute for Research in Reproductive Health, Mumbai.

The candidate has made important contributions in the field of human endocrinology by using site-directed mutagenesis to identify residues in the human follicle stimulating hormone receptor (FSHR) which are crucial for FSH-FSHR interaction.

7. **Dr Riddhipratim Basu** (b 01.08.1988), PhD, International Centre for Theoretical Sciences, Tata Institute of Fundamental Research, Bengaluru.

Riddhipratim Basu has made significant contributions to percolation theory and stochastic growth models that are inspired by deep problems in statistical physics. This work is both prolific as well as exceptional and he has made a significant impact at a young age.

8. **Dr Sayak Basu** (b 25.03.1987), PhD, Department of Earth and Environmental Sciences, Indian Institute of Science Education and Research, Mohali.

Dr. Basu Sayak is interested in pursuing research in several areas and directions that include studies of “Isotope Hydrology”, “Isotope enabled organic geochemistry” and understanding “climatic variation” and its impact on vegetation composition. Dr. Basu also plans to study question associated with monsoon ecosystem dynamics. At another level, he is interested in studies of fluvial & pit sediments, retrieved from the western and southern India, using proxies, such as oxygen and carbon isotope composition of carbonate, and of soil organic matter.

9. **Dr Debasish Borah** (b 12.09.1985), PhD, Department of Physics, IIT Guwahati

Dr. Debasish Borah is a very prolific researcher who has made many significant and innovative contributions in the broad areas of particle physics phenomenology of both su-persymmetric and non-supersymmetric grand unified theories, neutrino mixing, the origin of matter-antimatter asymmetry in the universe, and the effects of dark matter in the evolution of the early universe. His papers have been published in reputed international journals. He has also been active in involving students at IIT, Guwahati in research in these areas.

10. **Dr Debojyoti Chakraborty** (b 28.08.1985), Ph.D, IGIB, New Delhi

INSA Medal for Young Scientist 2020 is given to Dr Debojyoti Chakraborty for his phenomenal work on understanding the mechanism of gene editing by CRISPER/Cas technology and developing a gene editing technology that can be used for treatment of many diseases including rare genetic disorders and detection of Covid-19.

11. **Dr Gourab Chatterjee** (b 28.03.1987), PhD, Max Planck Institute for the Structure and Dynamics of Matter (MPSD), Hamburg, Germany.

Dr. Gourab Chatterjee has made seminal contributions leading to a better understanding of the complex physics of intense-laser-produced plasmas. In particular, by recreating scaled versions of astrophysical scenarios (such as the solar wind) in the laboratory, he has demonstrated the astrophysical relevance of laser-plasma instabilities and turbulent giant magnetic fields, thereby validating the ubiquity of turbulence. He has employed novel target designs involving carbon nanotube arrays, for overcoming these instabilities that are detrimental to fast electron transport and its various applications in high-energy-density science. His work has consistently appeared in high profile journals.

12. **Dr Snehasis Daschakraborty** (b 22.09.1985), PhD, Department of Chemistry, Indian Institute of Technology Patna.

For significant contributions in the area of dynamics and hydrophobicity in supercooled water.

13. **Dr Sreejith Ganesh Jaya** (b 10.04.1985), PhD, IISER Pune, Pune.

Dr. Sreejith Ganesh Jaya works on theoretical condensed matter and statistical physics. He has done original and important work in a wide variety of strongly correlated systems such as fractional quantum Hall systems, periodically driven spin systems (this led him to develop a beautiful collaboration with his experimental colleagues), topological states in graphene, and the classical cubic dimer model. His research involves a combination of high quality analytical and numerical work. He has supervised or worked with many Ph.D. students and undergraduates when he was a postdoc and as a faculty member in IISER Pune.

14. **Dr Vanika Garg** (b 10.04.1989), PhD, ICRISAT, Hyderabad, TN

She advanced the understanding of molecular basis of *Cicer-Ascochyta* pathosystem and developed first gene expression atlas of chickpea. As member of international projects, she contributed significantly to the genome sequencing of groundnut, pearl millet and to identification of candidate genes for stress tolerance etc. in legumes.

15. **Dr Shyam Sundar Ghoshal** (b 24.07.1985), PhD, Tata Institute of Fundamental Research Centre for Applicable Mathematics, Bangalore.

Shyam Sundar Ghoshal has made fundamental contributions in the area of conservation law with discontinuous flux by settling the question of total variation of the solution completely and also obtained complete results for the controllability and structure of the solution profile for scalar convex conservation laws.

16. **Dr Imran Asatar Girach** (b 14.01.1985), PhD, Space Physics Laboratory, Vikram Sarabhai Space Centre, Indian Space Research Organisation, Thiruvananthapuram

Dr. Imran Asatar Girach is pursuing studies of atmospheric-trace-gases ( $O_3$ , ozone),  $CO$ ,  $NO_x$ , Methane,  $CH_4$  etc. at various levels using ground and space based observations, backed by modelling. Also designed field experiment covering remote regions (Oceans and Antarctic) and trace gas measurement over several Indian regions, as well as, coastal region and Foothills of Himalaya.

Dr. Asatar also participated in the thirty-Fifth Indian Scientific expedition to Antarctica and conducted ground based and balloon based observations coupling to in-situ data.

17. **Dr Ritu Gupta** (b 17.06.1986), PhD, Department of Chemistry, Indian Institute of Technology Jodhpur.

For developing novel materials and translating them into devices for application in energy, water and healthcare.

18. **Dr Pranjit Hazarika** (b 01.12.1986), PhD, Department of Geological Sciences, Gauhati University, Guwahati.

Dr. Pranjit Hazarika, is one of the most impressive and hard-working scientist, pursuing research related to Ore-Geology, Geochemistry, and, Petrology, and, he is pursuing different aspects of these studies since 2016.

Scientific focus of studies pursued by Dr.Pranjit also involve application of geochemistry and petrology to understand crustal evolution and genesis of ore deposit, and, he has made notable progress in this area.

Dr. Hazarika is interested in studying geo-chronological evolution of different terrains of the Dharwar Craton hosting gold deposits.He also pursued studies on geochronological evolution of “greenstone” belt of the Dharwar craton, and, currently pursuing efforts for “Chemical dating”.He has also developed an improved analytical protocol for dating “xenotime” using normal electron microprobe.

The overall contribution of Dr. Pranjit Hazarika, in multipole areas of Earth Sciences, is applauded by all.

19. **Dr Muhammed Jamsheer K** (b 15.04.1988), PhD, Amity Food & Agriculture Foundation, Amity University, Uttar Pradesh.

For excellent/pioneering work on

Control of cellular homeostasis, growth and development in a plant model by the coupled effects of Glucose sensing and nutrient signaling.

20. **Mr Kautilya Kumar Jena** (b 17.05.1989), MSc, Institute of Life Sciences, Bhubaneswar

Mr. Jena Kautilya Kumar work is on molecular mechanism behind protein aggregation formation and its degradation. A novel mechanism by which cells during the oxidative or proteotoxic stress conditions can turn over the protein aggregates for their better survival was discovered. The pharmacological targeting of TRIM16 was found to increase its activity that will be useful in neurodegeneration.

21. **Dr Shobana Kapoor** (b 24.04.1985), PhD, Department of Chemistry, Indian Institute of Technology Bombay, Mumbai.

For biophysical studies of unusual lipids from the bacterial origin and on lipid-induced signalling pathways, with an emphasis on biotechnological applications.

22. **Dr Shraddha Madhav Karve** (b 04.05.1986), PhD, Institute of Evolutionary Biology and Environmental Studies, University of Zurich, Switzerland.

The candidate has made outstanding contributions in the field of experimental evolution. Specifically she has examined fitness changes in *E. coli* when exposed to multiple stressors that fluctuate unpredictably over time. Her work has valuable implications for the evolution of antibiotic resistance in bacteria.

23. **Dr Debjit Khan** (b 07.11.1985), Ph.D, Cleveland Clinic, Cleveland, Ohio, USA.

INSA Medal for Young Scientist 2020 is given to Dr Debjit Khan for his significant discoveries in understanding translational regulation of tumor protein p53 and its isoform  $\Delta 40p53$ . His findings also demonstrate for the first time that SNP in the 5' UTR of the p53 mRNA might have a role in translational control of this critical tumor-suppressor gene.

24. **Dr Roshan Kumar** (b 08.11.1985), PhD, NIPGR, New Delhi

He applied transgenic and antisense technologies to enhance C3 glucosinolates for improving defense against pests and pathogens in oil seed Brassica. Carried out mechanistic studies on G-protein isoforms and Regulator of G protein signaling for detailed understanding of glucosinolate pathway.

25. **Dr Punita Kumari** (b 25.11.1988), Ph.D, Indian Institute of Technology Kanpur, Kanpur

INSA Medal for Young Scientist 2020 is given to Ms Punita Kumari for her outstanding contribution to understand the GPCR- $\beta$ arrestin interaction, signaling, and regulatory paradigms that have promising therapeutic implications in the near future.

26. **Dr Kutubuddin Ali Molla** (b 22.02.1985), PhD, NRRI, Cuttack, Odhisa

He developed transgenic rice lines with Osoxo4 and chitinase genes for sheath blight resistance and identified candidate gene based SSR markers for salt tolerance breeding in rice.

27. **Dr Kamalika Mukherjee** (b 18.03.1985), PhD CSIR-Indian Institute of Chemical Biology, Kolkata.

For excellent/pioneering work on

Selective trafficking and export of miRNA through exosomes and its control by RNA binding proteins and elucidating their implications on liver function and response to Leishmania infection.

28. **Dr Lakshmeesha Kempaiah Nagappa** (b 01.03.1990), PhD, JNCASR, Jakkur, Bangalore.

For excellent/pioneering work on

Uniqueness of Nucleotide metabolism in malarial parasite in contrast to the host, hence a potential drug target and also a conserved detoxification mechanism.

29. **Dr Prabhakar Naraga** (b 10.04.1986), PhD, Indian Institute of Technology Bombay.

Dr. Prabhakar Naraga is focused on studies of Earth Sciences, and, in particular, on “Structural & “Metamorphic Petrology” to understand geo-dynamic processes, that operated on earth during the pre-Cambrian Eon. This is of significant interest in studies of Earth-Sciences from a relatively early era. His research also covers Metamorphic Petrology and pre-Cambrian tectonics.

Dr. Naraga also received reasonable start-up grants for his research. Studies conducted by him provided insight on the chronological and petrological evolution of the Archean craton, Proterozoic mobile belts, and, accretion zone.

30. **Dr Suresh Santhi Natesan** (b 08.06.1988), PhD, Centre for Brain Research, Indian Institute of Science, Bangalore.

Dr. Suresh Santhi Natesan made contribution towards elucidating the key molecular players as well as drug-like small molecules that gave new insights towards understanding the role of autophagy in neurodegenerative diseases such as Parkinson's disease.

31. **Dr Anubhab Roy** (b 05.01.1985), PhD, Department of Applied Mechanics, Indian Institute of Technology Madras, Chennai.

For his identification of singular eigenfunctions in the hydrodynamic stability of vortex columns and the application of the theories of geophysical flows.

32. **Dr Sutanu Roy** (b 31.10.1985), Dr. rer. nat., School of Mathematical Sciences, National Institute of Science Education and Research (NISER), Bhubaneswar.

Sutanu Roy works on quantum groups and non-commutative geometry. He and his co-authors have developed a theory of quantum group-twisted tensor products of  $C^*$ -algebras. Dr Roy has made very remarkable contributions to our understanding of locally compact quantum groups and their actions.

33. **Dr Nisha Singh** (b 02.01.1988), PhD, IARI, New Delhi

She developed a 50K SNP chip with highly polymorphic single copy genes for genotyping rice germplasm of interest to India. The array was patented and deployed in accelerating the improvement of Pusa Basmati for resistance to rice blast and in marker assisted back cross breeding programmes on introgression of genes for submergence tolerance.

34. **Dr Suraj Soman** (b 05.05.1986), PhD, Photosciences and Photonics Section, CSIR-NIIST, Thiruvananthapuram.

For improving efficiencies of solar cells by employing earth abundant materials as well as by optimizing their optical and electrical characteristics.

35. **Dr Kartik Sunagar** (b 17.03.1985), PhD, Centre for Ecological Sciences, Indian Institute of Science, Bengaluru.

The candidate has made outstanding contributions in the field of venomics and the phylogeny of venomous animals across invertebrate and vertebrate taxa. His research has redefined anti-venom therapies for venomous snakes in India by highlighting the tremendous geographical variation in venom components in the most venomous Indian snakes, and spearheading the development of regional anti-venoms.

36. **Dr Chandra Sekhar Tiwary** (b 01.05.1986), PhD, Department of Metallurgical and Materials Engineering, Indian Institute of Technology, Kharagpur.

For his work on developing new classes of nanostructured engineering materials that exhibit superior properties.

37. **Dr Himanshu Tyagi** (b 20.03.1985), PhD, Department of Electrical Communication Engineering, Indian Institute of Science, Bangalore.

For his work on Information theory, including strong covers for vanishing error, two party and multi-party problems with distributed information constraint.

38. **Dr Karthik V Raman** (b 20.04.1985), PhD, Tata Institute of Fundamental Research Hyderabad.

Dr. Karthik Raman has set up an impressive laboratory at TIFR Hyderabad pursuing frontier problems in condensed matter and interface physics, which hosts an inhouse designed MBE and UHV RF/DC sputtering unit and cryogen-free LT-STM with magnetic field. His areas of interest include topological insulators, proximity effects, interface-assisted molecular spintronics, and topological superconductivity. Results on topological insulator in proximity to a magnetic insulator reveal electric-field and magnetic-field controlled rich phenomena. His studies involving coupling of aromatic molecules and magnetic surface reveal interface states and have opened up molecular-design initiatives to tailor spin-dependent features.

39. **Dr Hareesh VS** (b 07.12.1988), PhD, Department of Botany, University of Calicut, Kerala.

The candidate is an outstanding taxonomist and has made significant contributions to the systematics of plant families such as Musaceae, Rubiaceae, and Zingiberaceae, with the addition of 34 taxa new to science, from across south- and south-east Asia, including the Andaman and Nicobar Islands.

40. **Dr Md. Ali Zinna** (b 04.09.1986), PhD, Department of Mathematics and Statistics, Indian Institute of Science Education and Research Kolkata.

Md. Ali Zinna has made significant contributions to the study of Projective modules including splitting of projective modules, efficient generation of ideals etc. His work regarding the set of isomorphism classes of (oriented) stably free modules of rank  $d$  over a commutative Noetherian ring of dimension  $d$  needs a special mention.