

Brief CV of Dr. Tata Narasinga Rao

Dr. Tata Narasinga Rao received his Ph.D. degree in Chemistry from Banaras Hindu University, India in 1994. After working at IIT Madras as Research Associate, he moved to The University of Tokyo in 1996 as a JSPS post-doctoral fellow and subsequently became lecturer in the same University in 2001. He joined International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI), Hyderabad, India, in 2003 as senior scientist, and presently he is Director of ARCI. In addition, he is also an Adjunct Professor at IIT Hyderabad.



He is recipient of several awards and honors including 'Material Research Society of India (MRSI) Medal'-2009; 'Tokyo University of Science President Award'-2014; 'Academician of Asia Pacific Academy of Materials (APAM)'-2015; 'Technology Day National Award'-2016 (received from President of India); Fellow of Telangana & AP Academy of Sciences'-2017; and 'Bangalore India Nano Innovation Award'-2018 (receiver from Bharat Ratna, Prof. CNR Rao). Recently, he is selected for Materials Science Annual Prize-2022 of MRSI.

Dr. Rao has published more than 190 research papers and filed/granted more than 20 international and Indian patents several of which have been translated to technological developments. His publications got total citations more than 16000 with an h-index of 51. The average Impact Factor for his publications of last 5 years is above 5.

Dr. Rao is known for his translational nanomaterials research. His research contributions in the field of electrochemistry and nanomaterials later led to several technologies at ARCI which made the Institute well known for nanotechnology in India. During the period when Dr. Rao joined, Nano Mission was initiated in India for translational research. He has developed novel, scalable and low cost processes for suspension/powder production of nano-silver and nano-TiO₂ for self-cleaning/antibacterial textile applications, high performance Li-ion electrode materials, bio & organic waste-derived activated carbon for supercapacitors and nano-aluminium for high energy applications, while demonstrating their performance at prototype device level. His Group has mainly focused on materials development by novel synthesis processes for Lithium Iron Phosphate (LFP) and Lithium Titanate (LTO) at 10 Kg level production and the LFP technology, for the first time in India, is transferred to an Indian industry, while LTO is being in the process of technology transfer. Dr. Rao identified during discussions with scientists of HPCL, that Petcoke (a by-product of oil-refinery) can be a very good source for supercapacitor electrodes

and started this project. Being the PI of the project with partial funding from HPCL, he established a semi-pilot facility at ARCI for supercapacitor fabrication and demonstrated at practical device level with 1200 F capacity, on par with a commercial device. Seven of the technologies developed by his team are transferred to industry and are commercialized. He is presently focusing on emerging fields like supercapacitors, Na-ion batteries, Room temperature Na-S batteries and Li-Sulfur batteries. He is venturing into hydrogen technology such as high temperature water electrolysis through SOEC & PEM routes, considering the present day national interests and requirements.

Other areas of his research interest include solar energy materials, Photocatalysis, Diamond Electrochemistry, biosensors/devices. He is mentor of biomedical working group at ARCI with special focus on additively manufactured biomedical devices and bio-compatible coatings. He has also significantly contributed to UVC-based systems and copper-coated masks for Covid-19 disinfection during recent pandemic situation. The copper-based masks (under Nano Mission project) were shown to fight against SARS CoV 2. Several thousands of the self-disinfecting masks were produced and distributed.