

# Translating Metals into Medicine: Since and Then

27 February 2018 - 03 March 2018

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## Overview

Healing properties of metals have 5000 years of history. However, discovery of bacteriostatic and antineoplastic properties of cisplatin in 1969 by Bernard Rosenberg played pivotal role in systematic exploration of metal-based compounds for medicinal applications. Since then cisplatin that contains no elemental carbon, has established itself as the “poster boy” of metal based drugs and so called “medicinal inorganic chemistry” has expanded exponentially. Metal complexes by virtue of variable oxidation states and coordination number, accessible redox chemistry, photo-chemical properties, in fact, claim legitimate candidature for potential clinical application. Recent advances in medicinal inorganic chemistry which is interfacing medicinal chemistry and inorganic chemistry, demonstrate significant prospects for the utilization of metal complexes as drugs or diagnostic agent, presenting a flourishing arena for inorganic chemistry. However, future development of medicinal inorganic chemistry requires an understanding of the physiological processing of metal complexes, to provide a rational basis for the design of new metal-based drugs, application of new methodologies as well. GIAN course has been shaped to high-light the concept of translation of metals into medicine and diagnostics, present loop-holes in current methodology or technology in medicinal inorganic chemistry would left us a enormous scope to encompass the burnig issues as well as the solutions in a common platform through the proposed GIAN course at NIT Manipur.

<b>Modules</b>	<p><b>Module-1: 27 February, 2018</b> Recent advanced on metal-based compounds in neuro degenerative diseases</p> <p><b>Module-2: 27 February, 2018</b> Scope of metal complexes as anti-microbial and anti-malarial agents</p> <p><b>Module-3 28 February, 2018</b> Diagnosis of diseases using metal-based compounds</p> <p><b>Module-4: 28 February, 2018</b> Metal-based module for sensing RNA in vitro/in vivo</p> <p><b>Module-5: 01 March, 2018</b> Novel anticancer platinum-based complexes</p> <p><b>Module-6: 01 March, 2018</b> Non-platinum anticancer agents at post genomic era</p> <p><b>Module-7: 02 March, 2018</b> Multi-targeting via redox-modulation and next-generation anticancer agents</p> <p><b>Module-8: 03 March, 2018</b> Recent advances on coordination compounds in Photodynamic Therapy of Cancer</p> <p><b>Number of participants for the course will be limited to eighty.</b></p>
<b>You Should</b>	<ul style="list-style-type: none"><li>▪ Faculties, scientists, engineers and researchers from academia, R&amp;D laboratories or industries.</li></ul>

<b>Attend If...</b>	<ul style="list-style-type: none"> <li>▪ Student at all levels (BTech/MSc/MTech/PhD) or postdoc from any academic and technical institutions.</li> </ul>
<b>Fees</b>	<p>The participation fees for taking the course is as follows:</p> <p><b>Participants from abroad: US \$200</b></p> <p><b>Participants from Industry/ Research Organizations: Rs. 5000/-</b></p> <p><b>Participants from Academic Institutions:</b></p> <p><b>UG Students: Rs. 1000/-</b></p> <p><b>PG Students: Rs. 1500/-</b></p> <p><b>Ph. D Students: Rs. 2000/-</b></p> <p><b>Postdoctoral fellow/Research Associate: Rs. 2500/-</b></p> <p><b>Faculty Members: Rs. 3000/-</b></p> <p>The above fee includes all instructional materials, computer use for tutorials and assignments, laboratory equipment usage charges, 24 hr free internet facility. The participants will be provided with accommodation on payment basis if available</p>

## The Faculty



**Prof. Andriy Mokhir (University of Erlangen-Nürnberg)** received his Ph.D. in 1997 from the Kiev Shevchenko University in Ukraine. Between 1997 and 2002 he was a postdoctoral researcher at the North Dakota State University (Fargo, USA), Tufts University (Boston, USA) and Konstanz University.

Since 2002 he worked as an independent group leader at the University of Heidelberg being funded within Emmy Noether program of DFG and Plus3 program of Boehringer Ingelheim Stiftung. After his Habilitation in 2010, he was appointed as a Professor of Bioinorganic Chemistry at the University of Heidelberg. Since 1.1.2013 he became a Professor of Organic Chemistry at the University of Erlangen-Nürnberg. Mokhir's laboratory develops controllable / switchable chemical catalysts and the control is achieved by applying physical (light) or (bio)chemical (reactive oxygen species, metal ions etc) factors. These catalysts are used to regulate, affect and monitor biochemical processes or molecules in live cells. Prof. Mokhir has published over 90 scientific contributions in peer reviewed international journals. He is currently teaching bioinorganic chemistry, chemical biology at University of Erlangen-Nürnberg. For detail: <https://www.chemie.nat.fau.de/ak-mokhir/>



**Prof. Akhil R. Chakravarty (IISc, Bangalore)** received his PhD from Indian Association for the Cultivation of Science, Calcutta in 1982. He did his postdoctoral research with Prof. F. A. Cotton at Texas A&M University, USA (1982-1985). Prof. Chakravarty continued his research career at Indian Institute of Science, Bangalore since 1985 as the

independent researcher in the subject area of organometallics, X-ray crystallography, DNA photo-cleavage and photocytotoxicity with metal-based compounds. He published his work in more than 200 reputed journals and he was awarded with Shanti Swarup Bhatnagar (SSB) Prize in Chemical Sciences (1998), CRSI Silver Medal (2007), J. C. Bose fellowship as a recognition of his outstanding contribution to research. He has been elected fellow of the Indian Academy of Sciences (FASc) in 1995 and Indian National Science Academy (FNA) in 2006. Prof. Chakravarty is already the elected member of "Third world Academy of Science" since 2010. He held administrative position at IISc Bangalore as Chairman of the department of Inorganic and Physical

## Course Co-ordinator

**Dr. Mithun Roy**

Phone: +918415045823

E-mail: [mithunroy@nitmanipur.ac.in](mailto:mithunroy@nitmanipur.ac.in),  
[mithunroy.iisc@gmail.com](mailto:mithunroy.iisc@gmail.com)

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<http://www.gian.iitkgp.ac.in/GREGN>

Chemistry (2002–2006). For detail: <http://ipc.iisc.ernet.in/~arc/Prof.%20A.%20R.%20Chakravarty.html>

**Course Coordinator**

**Dr. Mithun Roy, NIT Manipur**



Dr. Mithun Roy received his PhD from Indian Institute of Science Bangalore in 2009 under the supervision of Prof Akhil R. Chakravarty. He did his postdoctoral research at IISc (2009-2011), University of Heidelberg (2011-2012) and University of Colorado, Boulder (2013-2014). He further pursued his independent research career at NIT Manipur since 2014 on theoretical and biological exploration of transition metal complexes of photo-activated chemotherapy. His research has been funded by SERB and BRNS. Currently he holds a position of Associate Dean (PG and PhD) at NIT Manipur.