



(Global Initiative of Academic Network)

Course on

Translating Metals into Medicine: Since and Then

27 Feb, 2018 - 03 Mar, 2018  
NIT Manipur



### Overview of the course

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.

### About NIT Manipur

NIT Manipur with 341.5 acr of land is established as the institute of national institute in 2010 at Langol, Impahl (Manipur) headed by Director under the direct supervision of Board of Governors(BOG) headed by The Chairman of the Board of Governors as the institute is registered under Manipur Societies Registration Act, 1989. Academic activities was initially started with computer science, electrical and electronics and telecommunication engineering. Currently NIT Manipur has flourished with five engineering and three basic science departments along with humanities.

### Way to NIT Manipur

NIT Manipur can be reached through direct flight from Delhi, Kolkata and Guwahati. Air India, Indigo, Air Asia flights are daily operating to Imphal International Airport. NIT Manipur is located approximately 7 Km from the airport, can be reached through taxi. Indian railways have train connection till Dimapur. Bus or taxi servicees are operating from Dimapur to Imphal which takes approximately five hours to reach Imphal from Dimapur.

### Who can attend this course?

- Faculties, scientists, engineers and researchers from academia, R&D laboratories or industries.
- Student at all levels (BTech/MSc/MTech/PhD) or postdoc from any academic and technical institutions.

### Registration

Registration fees for attending the course is as follows:  
Participants from abroad: US \$200  
Participants from Industry/ Research Organizations: Rs. 5000/-  
Participants from Academic Institutions:  
UG Students: Rs. 1000/-  
PG Students: Rs. 1500/-  
Ph.D Students: Rs. 2000/-  
Postdoctoral fellow/Research Associate: Rs. 2500/-  
Faculty Members: Rs. 3000/-  
If available, the participants will be provided with accommodation in hostel.

Online payment and online registration is recommended.

### Coordinators for GIAN course

Course Coordinator: Dr. Mithun Roy, Department of Chemistry, NIT Manipur  
E-mail: [mithunroy@gmail.com](mailto:mithunroy@gmail.com), [mithunroy@nitmanipur.ac.in](mailto:mithunroy@nitmanipur.ac.in)  
Local Coordinator: Dr. Th. David Singh, Department of Chemistry, NIT Manipur

### Learning Modules

#### Module-1

Recent advanced on metal-based compounds in neuro degenerative diseases

#### Module-2

Scope of metal complexes as anti-microbial and anti-malarial agents

#### Module-3

Diagnosis of diseases using metal-based compounds

#### Module-4

Metal-based module for sensing RNA in vitro/in vivo

#### Module-5

Novel anticancer platinum-based complexes

#### Module-6

Non-platinum anticancer agents at post genomic era

#### Module-7

Multi-targeting via redox-modulation and next-generation anticancer agents


#### Module-8

Recent advances on coordination compounds in Photodynamic Therapy of Cancer

Assignments, tutorials and examination

### Tutors

#### Foreign Faculty

**Prof. Andriy Mokhir**, University of Erlangen-Nürnberg  
 Prof. Andriy Mokhir 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/>

### Faculty from India

#### Prof. Akhil R. Chakravarty



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

### Course Coordinator

#### Dr. Mithun Roy



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 persued 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.