

# Inorganic chemistry of imaging: Magnetic resonance and optical imaging with coordination complexes

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## Overview

The development of imaging agents based on transition metal ions is a topic of current interest in biomedical research. Earth abundant transition elements such as iron have the advantage of being less expensive more available than gadolinium agents and also possibly safer for certain patient populations. There is also a focus on “smart” contrast agents that respond to biological environment such as pH or redox status. Responsive contrast agents are under development for the characterization of diseases, including cancer and cardiovascular disease. The development of transition metal ion contrast agents is challenging because electron spin state and oxidation state of the metal ion must be controlled by using coordination chemistry.

Accumulation of excess of transition metal ions in living organisms is also of current interest in the biomedical community. Many neurological diseases involve a misdistribution of iron, zinc or copper. Research in this area focuses on imaging of these metal ions by using fluorescent sensors or with metal ion responsive MRI contrast agents. This research requires the development of selective chelating binding agents for metal ions along with an imaging modality.

The main goal of this course is to give an overview of the rich opportunities that are available to chemists in the development of imaging agents based on transition metal ions. Participants will gain sufficient background on magnetic resonance and optical imaging applications in preparation for addressing important biomedical research problems. These goals will be accomplished by practical training in methods in imaging and the characterization of paramagnetic transition metal ion complexes.

Course participants will learn these topics through lectures and hands-on experiments. Also case studies and assignments will be shared to stimulate research motivation of participants.

<b>Modules</b>	Schedule dates: January 08, 2018 – January 12, 2018 Lectures: Morning 10 AM to noon Tutorials: Afternoon 3 PM to 5 PM <b>Number of participants for the course will be limited to fifty.</b>
<b>You Should Attend If...</b>	<ul style="list-style-type: none"><li>You are Researchers from university, Industry, and R&amp;D laboratories, who work in materials science/chemistry and related fields of science.</li><li>Students at all levels (B.Tech. /M.Sc./M.Tech./Ph.D.) or Faculty from reputed academic institutions and technical institutions.</li></ul>
<b>Fees</b>	The participation fees for taking the course is as follows: <b>Participants from abroad : US \$500 per participant</b> <b>Industry/ Research Organizations: Rs. 10000 per participant</b> <b>Academic Institutions other than Host Institute: Rs. 2000 per participant</b> <b>Host Institutes: Rs. 1000 per participant</b> The above fee include 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.

## The Faculty



### Prof. Janet R Morrow

**Prof. Janet R Morrow** is UB Distinguished Professor in the department of Chemistry, University at Buffalo. Her specialization is the synthesis of inorganic complexes for biomedical diagnostics, sensing or catalytic applications. Her research interests include Magnetic resonance imaging contrast agents containing iron, cobalt or nickel. Temperature, pH or redox responsive MRI contrast agents. Optical sensing of metal ions, especially iron. Recognition of unusual DNA or RNA structures by metal complexes



### Dr. Mobin Shaikh

**Dr. Mobin Shaikh** is an Associate Professor at Indian Institute of Technology Indore. His area of research including Single-Crystal-to-Single-Crystal(SCSC) Transformation, Design and synthesis of Inorganic complexes in particular MOFs for supercapacitors studies reactivity of organometallic complexes, Metal-ion and anion sensing, Metal nano-oxide materials as catalyst in organic transformation, cell imaging and molecular docking.

## Course Co-ordinator

For any information regarding eligibility fee payment, travel information, accommodation, etc., please contact the course coordinator via e-mail or phone

### Dr. Shaikh M Mobin

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