



शिक्षा मंत्रालय  
MINISTRY OF  
EDUCATION



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# Current Trends of Medicinal Chemistry: Applications for the Drug Developments

(Course Code: 2700209)

(3<sup>rd</sup> –7<sup>th</sup> March, 2025)

Department of Chemistry,

Visvesvaraya National Institute of Technology (VNIT), Nagpur

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## Overview

*“Welcome to the introductory course on the topic of Medicinal Chemistry with the lights of drug developments.”*

Medicinal chemistry plays a fundamental role in the drug development process, where the proper selection and synthesis of organic compounds are very important. The main aspects are to establish a well-defined Structure–Activity Relationships (SAR) and achieve profound efficacy with respect to a particular biological target. High-throughput screening of drug like compounds together with combinatorial chemistry, and molecularly defined targets that allow structure-based drug design have changed the role of a chemist in the pharmaceutical industry. In today’s world, it is important to understand bio-organic transformations. The advancement of new heterocyclic compounds with the required biological activity helps us to obtain selective inhibitors for specific enzymes and G-protein coupled receptors (GPCRs), which could be used as effective drugs.

In the first part of this course, we will be introduced to the theories of medicinal chemistry, in particular the study on enzymology as well as on GPCRs and studies of their SAR. Aspects of biochemistry, pharmacology and therapeutic treatments will also be included for the development of new biologically active compounds with pharmacodynamic and pharmacokinetic properties as pharmacological tools, diagnostics or potential therapeutics (including radiopharmaceuticals). The second part of the course will focus on the current scenario of sustainable drug development. Various examples of organic and bio-organic transformations will be discussed. Appropriate practical usage with the theoretical knowledge will be properly provided to ensure the ability of the participants to understand the contents in a comprehensive way. Part of this course will consist of current research activities of these emerging fields combined with lessons learned from history.

## Course Details

<b>Modules</b>	<p><b>Module 1: Basic principles and applications of structure based drug discovery (SBDD)</b></p> <p><b>Module 2: Understanding the concept of fragment based drug discovery (FBDD)</b></p> <p><b>Module 3: Problem solving techniques of drug discovery using Medicinal Chemistry approach</b></p> <p><b>Module 4: Aspects of medicinal chemistry in Organic Process Research and Development (OPR&amp;D)</b></p> <p><b>Module 5: Applications of target oriented drug discovery with the real examples of marketed drugs</b></p>
<b>Who can attend</b>	<ul style="list-style-type: none"><li>▪ Students (B.Sc., M.Sc. and Ph.D.) of Chemical Sciences and Pharmacy interested in Medicinal Chemistry.</li><li>▪ Faculty members and scientists from academic, research institutions or from the pharmaceutical industries.</li><li>▪ Organic or process chemist interested to learn the challenges of drug discovery.</li><li>▪ Data scientists working on the Computer Aided Drug Designing (CADD)</li></ul>

## Fees

The participation fees for taking the course is as follows:

**Participants from abroad : US \$500**

**Industry: INR 4000**

**Academic & Research Institutions: INR 3,000**

**Students (B.Sc., M.Sc. and Ph.D.): INR 1,000**

The above fees include working materials, lunch, tea/snacks, instructions and assignments, computer use for tutorials, internet facility.

The accommodation needs to be done separately with a request. The guest house charges are INR 1800/- per day. Hostel AC accommodation (INR 600/- per day in sharing room) can also be made on the prior request.

**Registration fee payment procedure:**

**Step 1:** Visit the link: <https://pay.vnit.ac.in/home>

**Step 2:** Under 'Select Payment Category', choose (Conference/Seminar/Workshop).

**Step 3:** Under 'Name of the Event (Conference/Seminar/Workshop),

choose 'Current Trends of Medicinal Chemistry: Applications for the Drug Developments (Course Code: 2700209)'

**Step 4:** Fill in the required details, select the registration category as applicable, and pay the fees.

**Link for the Registration:** <https://forms.gle/GY3ttUt4p5j85vj86>

## The Faculty



**Professor Holger Stark** is a German pharmacist completed his PhD in Medicinal Chemistry under the supervision of Prof. W. Schunack at the Free University of Berlin, Germany, in 1991 on newly designed prodrugs (BF2.94). During his habilitation at the same university he worked on neurotransmitter ligands, mainly at dopamine and histamine receptor subtypes for the central nervous system. In 2000 he became full professor at the Goethe University in Frankfurt, Germany and moved to Heinrich-Heine-University Düsseldorf in

2013. His research specializes in developing novel synthetic receptor ligands for **G protein-coupled receptors**, particularly histamine and dopamine receptors. **Prof. Stark** is a co-inventor of the active ingredient **Pitolisant**, the only histamine H<sub>3</sub> receptor antagonist approved till date. He is founded some start-up companies on cancer therapeutics (Warburg Glycomed, PSites Pharma) and has received several prizes for his successful research as well as for teaching. He received in 2016 an honorary doctorate from the **University of Nis, Serbia**. On more than 400 book contributions, original papers, reviews and patents he has focused on neurotransmitter as

well as on lipid signaling research. The developments of novel pharmacological tools for imaging and of ligands with designed selectivity are some of the highlights. He is co-inventor of pitolisant (Wakix®, Ozawade®), the first histamine H3 receptor antagonist with market approval and has prepared some back-up (pre)clinical candidates in different leads for various targets. Professor Stark was editor-in-chief of the Archiv der Pharmazie – Chemistry in Life Sciences, one of the oldest journals on Medicinal Chemistry from 2004 - 2019.



**Dr. Sandipan Halder** has completed his doctoral program from the department of Chemistry Indian Institute of Technology Kanpur (IITK) under the supervision of **Professor Manas K. Ghorai**. In his first post-doctoral research in the Bar Ilan University, Ramat Gan, Israel, he has worked in the field of Physical Organic Chemistry under the supervision of **Professor Shmaryahu Hoz**. After that he has been awarded prestigious Indo-USA **Fulbright-Nehru Post-doctoral fellowship** from United States India Educational Foundation (**USIEF**) to pursue post-doctoral research the department of Chemistry & Biochemistry at The Ohio State University, Columbus, Ohio, USA under the supervision of **Professor T. V. RajanBabu**. In this duration, he was involved in the research field of asymmetric catalysis for the hydrovinylation reactions. He joined the department of Chemistry **Visvesvaraya National Institute of Technology (VNIT) Nagpur** in the year of 2016, as an Assistant Professor. Currently, he is continuing in the same position. He has been awarded research grant under Early Career Research from the SERB, Govt. of India and Indo-Russian and Indo-Philippines collaborative research grant from DST, Govt. of India. At present Dr. Halder's research group is working in the field of organo catalysis precisely Hydrogen Bond Donor (HBD) catalysis. The catalytic methods have been applied are for stereoselective synthesis of heterocycles (APIs) for different medicinal applications.

## Course Details:

Date: 3<sup>rd</sup> –7<sup>th</sup> March, 2025

### Venue:

Virtual Classroom

3<sup>rd</sup> Floor

New Library Building

Visvesvaraya National Institute of  
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## Course Coordinator

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<Registration link>

<https://forms.gle/GY3ttUt4p5j85vj86>