Spring 2023 courses

CHEM 6389 (required) Dr. Balkus Sci. Lit. and Communication

CHEM 5310 (elective) Dr. Toher Computer Programming and ML

CHEM 5311 (elective) Dr. Torabifard Classical Simulations for Biological and Condensed Systems

CHEM 5332 (elective) Dr. Romiti Natural Products Synthesis

CHEM 5340 (elective) Dr. Stefan Polymers

CHEM 5342 (elective) Dr. Zheng Nanomedicine

CHEM 6369 (elective) Dr. Meloni Bioinorganic Chemistry

CHEM 6100 (required) Dr. Torabifard Seminar

CHEM 5310: Introduction to Programming for Chemistry

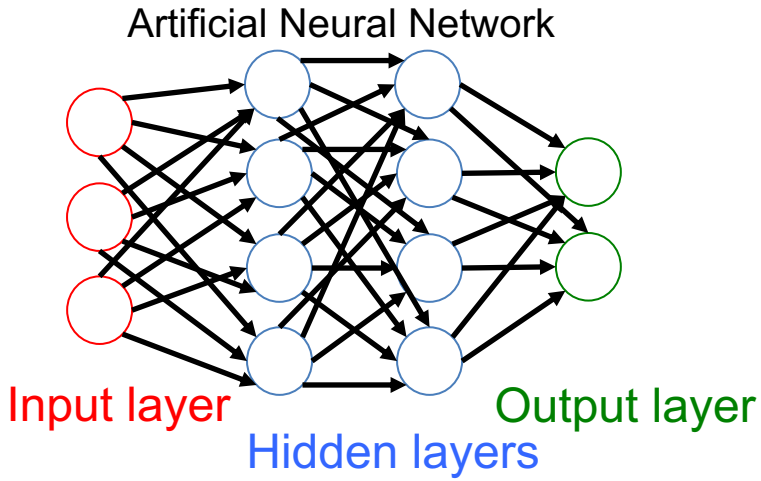
- Overview of programming language types: compiled languages vs. interpreted languages; Python, C++, Fortran
- Basic programming concepts (using Python language as an example): for/while loops, if/else statements, data types and structures, mathematical and logic operators
- Basic data science/machine learning concepts

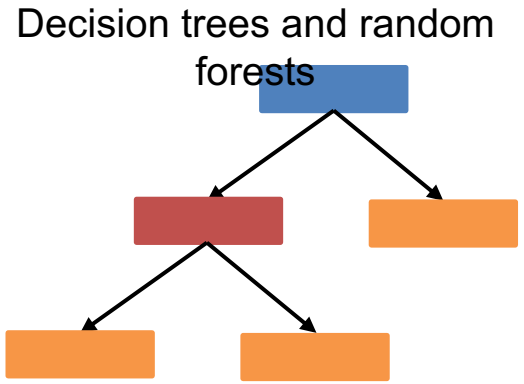
NumPy

SciPy

scikit learn

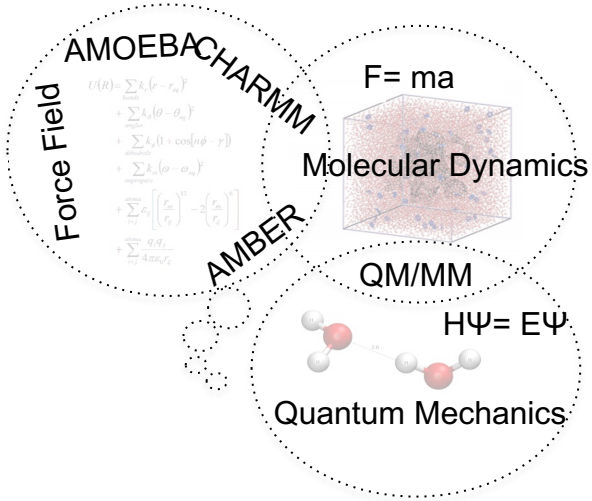
Dr. Cormac Toher



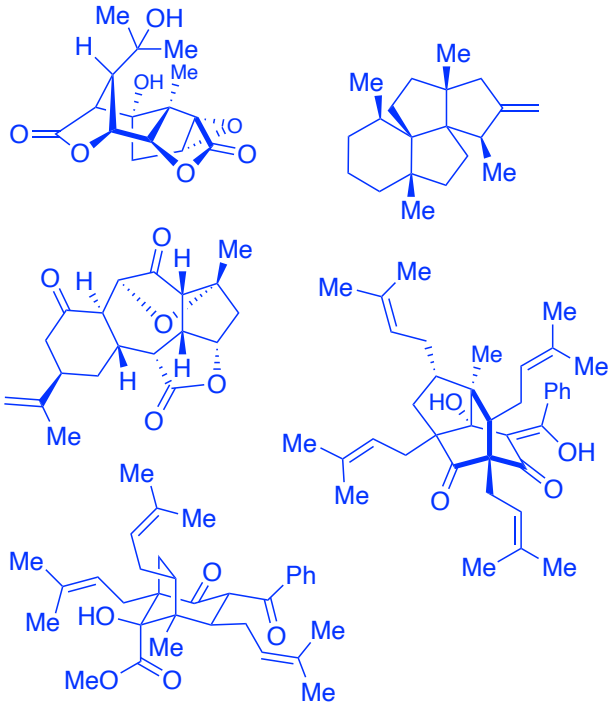


CHEM 5311 -- Spring 2023 Dr. Hedieh (Hedi) Torabifard

Classical Simulations for Biological and Condensed Systems



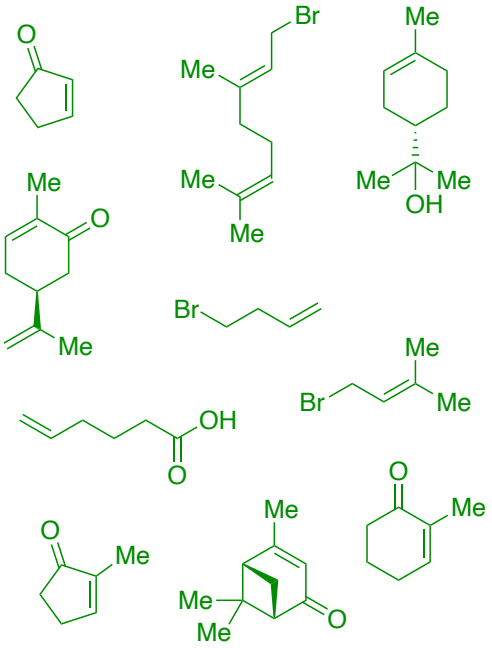
- Force Field Development
- Molecular Dynamics (MD) Simulations
- Free Energy Methods
- Hybrid Quantum Mechanics and Molecular Mechanics (QM/MM)
- Learn High Performance Computing (HPC) environment
- Biological systems such as proteins, DNA/RNA, and lipids.
- Condensed systems such as water, and ionic liquids.



complex bioactive natural products

Dr. Filippo Romiti

retrosynthetic analysis



biofeedstock compunds and readily available materials

development of new methods and synthesis strategies

CHEM 5340
Advanced Polymer Science and Engineering

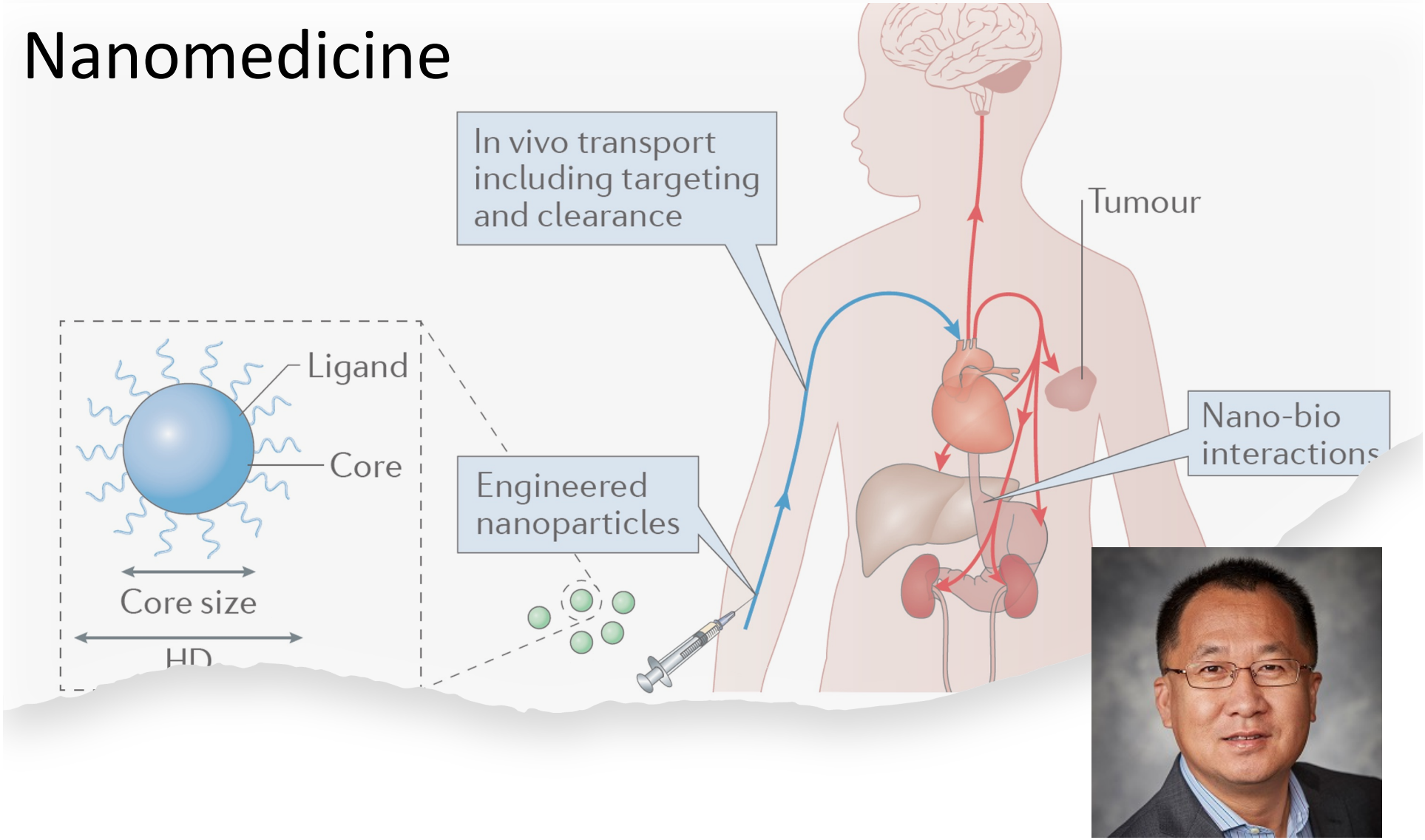
Instructor: **Mihaela C. Stefan**
E-mail: mihaela@utdallas.edu
Webpage: https://personal.utdallas.edu/~mci071000/

This course describes the synthesis, characterization, and properties of organic polymers, including structure/property relationships and strategies to tune the properties of polymer.

Topics include: synthesis, glass transition, elastomers, polymers for drug delivery and tissue engineering

CHEM 5342 / 4342:
Nanomedicine: Fundamentals and Applications
Prof. Jie Zheng, Spring 2023

Nanomedicine



Bioinorganic Chemistry
CHEM 6369 – Spring 2023

Instructor: **Gabriele Meloni**

E-mail: gabriele.meloni@utdallas.edu

Course description:
The course will cover advanced topics in bioinorganic chemistry including: Principles of coordination chemistry, Crystal and ligand field theory, inorganic elements in biochemistry, Biological metal ligands, Metalloproteins and metalloenzymes, Oxygen transport and activation, Electron transfer in metalloproteins, Metal transport (membranes, energy, channels, pumps), Metals in medicine.

Prerequisites: Advanced Biochemistry (CHEM 5361), or in alternative UG Biochemistry I (CHEM 3361) and Inorganic Chemistry I (CHEM 3341)

Learning outcomes:
Upon completing this course, students will be able to:
1. Understand principles in coordination chemistry of transition metals and biological ligands
2. Understand structural, reactivity and biophysical properties of metalloenzymes and metalloproteins
3. Achieve knowledge in bioinorganic chemistry and understand the interactions between metals and biological macromolecules.