**Medicinal Chemistry Department, School of Pharmacy, Mashhad University of Medical Sciences**

* **Medicinal Chemistry**
  + **Drug design and synthesis**
    - **Small molecule drug design**
      * + **Anticoagulants**
        + **Antibacterial**
        + **Anticancer**

**Tubulin inhibitors**

**HDAC inhibitors**

**Kinase inhibitors**

* + - * + **Anti-Alzheimer**
      * **Total synthesis**
        + **Imidazole derivatives**
        + **Quinoline derivatives**
        + **Coumarin derivatives**
        + **Chalcone derivatives**
        + **Other heterocycles**
      * **Structure characterization**
        + **NMR**
        + **Mass**
    - **Large molecule drug design**
      * **Peptide synthesis**
        + **Dipeptides**
        + **Nano-micelles**
      * **Protein expression and extraction**
      * **Aptamer selection and synthesis**
      * **Enzyme extraction**
      * **Small Molecule Drug Conjugate**
* **Targeted delivery of drugs and genes using nanocarrie**rs
  + **Computational Chemistry**
    - **Protein engineering**
      * **Domain modification**
      * **Point mutation**
    - **3D structure modeling**
    - **Molecular docking**
    - **Molecular dynamics**
    - **QSAR and 3D QSAR**
    - **Virtual screening**
  + **Biological evaluation**
    - **MTT Assay**
    - **Enzyme inhibitory Assay**
      * **HDAC inhibition activity**
      * **Kinase inhibition activity**
      * **Cholinesterase inhibition activity**
  + **Drug and food analysis**
    - **HPLC (LC-UV, LC-MASS/MASS)**
    - **GC**
    - **Atomic absorption**
      * **Heavy metal analysis**
    - **CD spectroscopy**
      * **Protein secondary structure analysis**
    - **Spectro fluorimetry**
      * **Aptamer-based sensors**