Chemistry and synthesis of secondary natural compounds

Schedule:

The course aims to introduce students to the structure and occurrence of secondary metabolites, their biological and chemical synthesis, and their potential applications. During the lectures, we will study the complex logic of organic chemistry using during the synthesis of natural compounds by discussing the synthesis of numerous examples that confirm their structures. During the discussion of procedures, we will focus on synthesis planning (retrosynthetic analysis) and interpreting the mechanisms of synthetic steps that explain regioselectivity and stereoselectivity.

Key topics covered in the course include:

- Classification of metabolic processes, key building blocks and fundamental transformations.
- Methods used for the isolation and structural elucidation of natural compounds.
- The role and use of natural compounds in drug development.
- Problems of the designing and chemical synthesis of natural compounds, analyzed through selected examples.

Literary examples may vary constantly; the compounds listed represent only the basic set:

- Bio- and chemical synthesis of menthol.
- Retrosynthetic analysis and chemical synthesis of Periplanone-B.
- Retrosynthetic analysis and chemical synthesis of Isocomene.
- Retrosynthetic analysis and chemical synthesis of Batrachotoxin.
- Retrosynthetic analysis and chemical synthesis of Pallavicin and Neopallavicin.
- Retrosynthetic analysis and chemical synthesis of Brefeldin-A.
- Retrosynthetic analysis and chemical synthesis of Tetradotoxin.
- Retrosynthetic analysis and chemical synthesis of Taxol.
- Retrosynthetic analysis and chemical synthesis of Gracilamine.
- Retrosynthetic analysis and chemical synthesis of Valerenic acid., etc.