

Separation Processes in Biotechnology - lecture + exercises (30 h + 15 h, ECTS 4, exam)

1. Introduction to separation processes in biotechnology.
2. Mechanical processes of solid particles separation. Motion of solid particles in liquids. Sedimentation. Flocculation and coagulation. Filtration. Centrifugation.
3. Cell disruption. Elements and properties of cell walls of bacteria, yeast, mould, plant cells and mammalian cells. Cell disintegration techniques: mechanical, chemical and biological.
4. Membrane processes.
5. Adsorption. Liquid chromatography.
6. Extraction. Distillation and rectification.
7. Precipitation. Crystallization. Drying of bioproducts.
8. Advanced separation processes
9. Separation in Bioreactors
10. Separation of enantiomers
11. Affinity separation
12. Membrane chromatography
13. Advanced oxidation
14. Hybrid processes