Karlsruhe Institute of Technology

MAB
PROCESS ENGINEERING IN LIFE SCIENCE

Institute of Process Engineering in Life Sciences
Section IV: Biomolecular Separation Engineering

Recombinant Production and Purification of HBcAg Virus-Like-Particles

General information

- Supervisor: Lea Bisch
- Position available: Student assistant (Hiwi)
- Starting form: a.s.a.p. / Jan. 2027
- Weekly hours: ~ 10 h
- Duration: to be discussed, extension possible
- Language spoken: German, English

Background

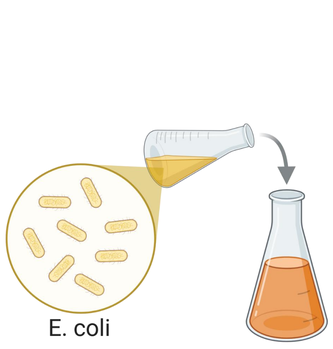
Virus-like particles (VLPs) are highly ordered protein assemblies that resemble the structural organization of viruses without being infectious or replication-competent. In this project, VLPs based on the Hepatitis B core antigen (HBcAg) are investigated as a modular platform for future cargo-loading applications. A prerequisite for these studies is the reliable recombinant production of HBcAg and the establishment of a robust purification process yielding well-defined and highly pure VLP preparations. HBcAg is produced intracellularly in *Escherichia coli*, followed by cell disruption and several downstream processing steps for product recovery and purification. The HiWi project will focus on the reproducible production, purification and analytical characterization of recombinant HBcAg VLPs according to an established workflow, providing defined starting material for subsequent experimental studies.

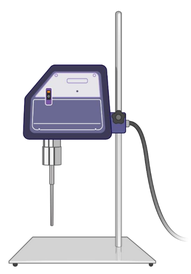
Tasks

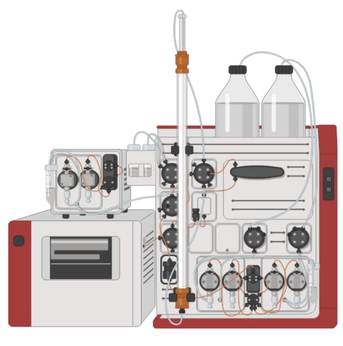
- recombinant expression of HBcAg in *E. coli*
- cultivation and biomass harvest
- cell disruption and clarification
- execution of established purification steps
- preparation of buffers and solutions
- analytical quality control of intermediate and final samples
- documentation of experiments and results

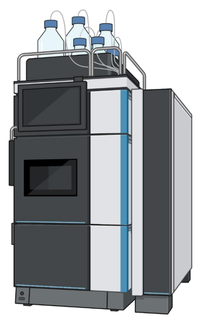
Methods

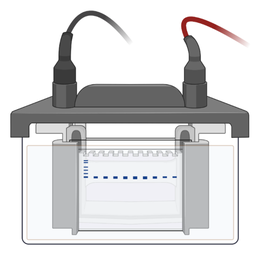
- microbial cultivation
- centrifugation and cell disruption
- ammonium sulfate precipitation
- chromatography
- SDS-PAGE / NAGE
- UV/Vis and/or HPLC-based analysis











Your profile

- student in Bioengineering, Biotechnology, Chemical Engineering, Biology or related field
- interest in experimental bioprocessing and protein purification
- careful, structured and reliable laboratory work
- basic microbiological or biochemical laboratory experience is advantageous
- ability to follow established protocols independently after training

How to apply

Send a short CV, a latest transcript of records and a few sentences about your background and interest to lea.bisch@kit.edu

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