The *E. coli* Shortcut to Affordable VLPs

Virus-like particles (VLPs) enable targeted delivery, vaccines and nanobiotechnology, but production is often costly, slow and difficult to scale. acib has developed a modular *E. coli*-based workflow addressing key bottlenecks: inclusion bodies, contaminant removal, refolding and particle assembly. The result is structurally intact customizable VLPs without the cost and complexity of advanced cell-culture systems.

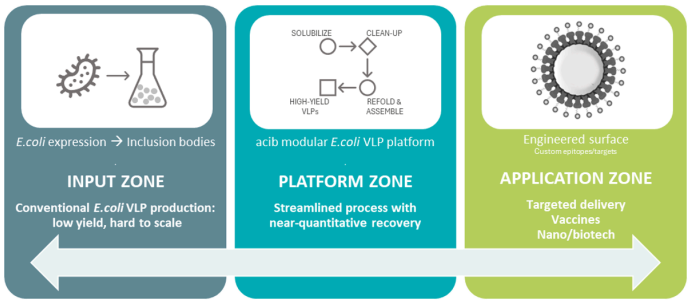
BACKGROUND

VLPs are non-infectious protein nanoparticles that mimic viral architecture without containing genetic material. Their highly ordered surfaces support epitope display for targeted delivery, vaccine design and related applications. Most VLPs are produced in insect, mammalian, plant or yeast systems, which can involve high costs, long timelines, heterogeneity and scale-up or purification challenges.

E. coli offers a fast, well-understood and cost-efficient alternative, but typically yields capsid proteins as inclusion bodies. Recovering functional VLPs requires solubilization, contaminant removal and controlled refolding and assembly – steps that are often laborious, hard to scale and associated with product loss in conventional workflows.

TECHNOLOGY

acib has established a modular E. coli platform for VLP production that couples efficient contaminant removal with controlled refolding and assembly into structurally defined particles. The process achieves yield improvements by nearly two orders of magnitude, approaching quantitative recovery. The platform is adaptable: VLP surfaces can be engineered for application-specific recognition or targeting, enabling broad use across delivery and immunogenic applications.



OFFER

We co-develop tailored *E. coli*-based VLP workflows aligned with your target application. This can include construct and expression design, purification under denaturing conditions, functional refolding and assembly, particle characterization, and optional surface engineering for recognition or targeting. Project scope, deliverables and timelines are defined with you and full IP transfer to the company partner is possible.

EXPERTS

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DEVELOPMENT STATUS:

Status of the project proposal – Technology Readiness Level 4 (technology validated in lab)
Patent application: ongoing

KEYWORDS

- Virus-like particles
- Low-cost VLP manufacturing
- *E. coli* expression
- Inclusion bodies
- Refolding and assembly
- Capsid proteins
- Epitope display
- Targeted transport
- Vaccine platforms
- Protein nanoparticles
- Nanobiotechnology
- Scalable biomanufacturing

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