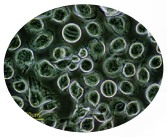
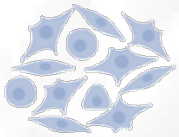
BIORTUS

Finding the right expression system for protein production

The choice of the system relies on factors such as the protein type, intended applications, and the desired yield and cost. **Biortus provides a range of major expression hosts** to support your protein production and purification steps as you initiate your project.

Expression Systems at Biortus

Three Major Systems:

	Applications	Advantages	Disadvantages
E.coli 	❖ Structural biology ❖ Protein-protein interaction ❖ *In vivo* biotinylation possible	❖ Simple genetics ❖ Easy to manipulate ❖ **Fastest Turnaround** (2-4 weeks)	❖ Lack of eukaryotic PTM ❖ Codon usage issues ❖ Inclusion bodies may need refolding ❖ Potentially low activity for eukaryotic proteins
Insect cells 	❖ Functional assays ❖ Structural biology	❖ PTMs ❖ Good for secreted proteins ❖ **Able to tolerate toxic proteins better** compared to mammalian cells	❖ 6–8 week turnaround for protein production ❖ Higher consumables cost ❖ Not as easy to scale up compared to bacterial systems
Mammalian cells 	❖ Functional assays ❖ Able to integrate into cell-based assays ❖ Therapeutic protein production ❖ Antigen & Antibody production	❖ **Comprehensive eukaryotic PTMs** ❖ Closer to endogenous system for human proteins	❖ 4–6 week turnaround time ❖ Higher consumable costs ❖ Not as easy to scale up compared to bacterial systems

Recombinant protein expression systems serve as valuable tools for generating a range of proteins across diverse applications.

Ongoing advancements in expression systems aim to enhance protein production by improving yields, folding efficiency, and PTM capabilities.

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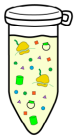
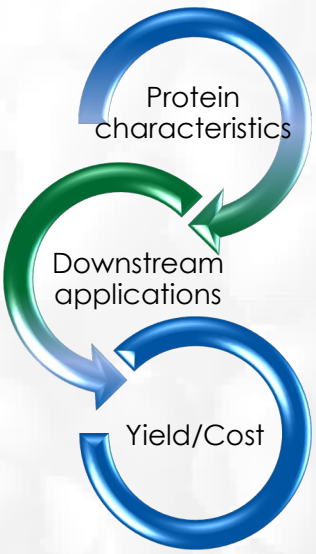
Different expression systems at Biortus

	Applications	Advantages	Disadvantages
Silkworm 	❖ Secreted & membrane protein production ❖ Functional assays ❖ Therapeutic protein production ❖ Antigen production	❖ Low maintenance cost ❖ Better at tolerating toxic proteins since a whole organism ❖ Similar to insect cell expression parameters	❖ More manual labor required for purification
Cell-free System 	❖ High throughput expression testing ❖ Toxic protein expression	❖ Faster and more efficient logistically compared to cell-based systems ❖ Adaptable to a range of production& testing schemes ❖ UAA or label incorporation	❖ Lower yield and quality ❖ Limited PTMs
Yeast*  *in development	❖ Structural biology ❖ Protein-protein interaction assays	❖ Eukaryotic PTMs ❖ Lower consumable cost	❖ Glycosylation differences with human systems ❖ Toxic mammalian proteins not well tolerated

Factors to consider when choosing an expression system



- Amount of protein needed
- Type of post-translational modifications, number of disulfide bonds, tolerability in the expression system
- Downstream application of the protein affects the scale, purity, and construct needed
- Time investment for development & Cost efficiency

BIORTUS

One-stop shop for Protein Expression & Purification

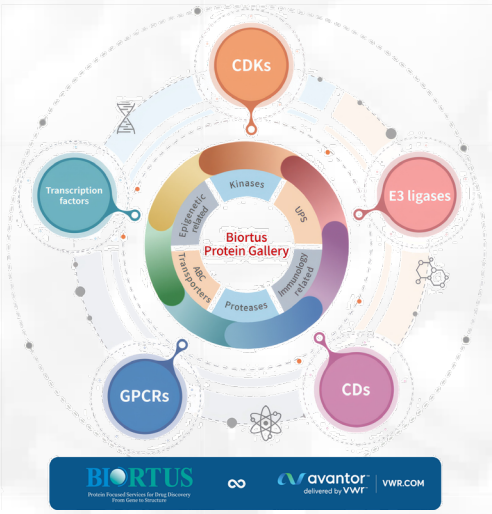
Since 2009, Biortus has been collaborating globally with research institutions, pharmaceutical, and biotechnology companies, delivering consistently **high-quality custom proteins** for every stage of biomedical research.

We employ expression systems to ensure the successful delivery of fit-for-purpose recombinant proteins, spanning **enzymes, kinases, transcription factors, immunity-related proteins, GPCRs, transporters, SLCs, E3 ligases**, **epigenetic proteins**, and more for our clients.

Convenience & Consistency:

Biortus provides an **off-the-shelf catalog,** now on VWR.

- Membrane Proteins (SLCs, GPCRs, etc.)
- Ubiquitin Proteasome enzymes (DUBS E1/E2/E3 Ligases)
- CDKs
- Transcription factors and more



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