



Downstream Processing Examples

Bio-Technical Resources (BTR)

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Example 1: *E. coli* Fermentation Process Development and Product Recovery

❖ Client needs

- Optimize a base fermentation process for low-cost production of a small molecule using a recombinant *E. coli* strain
- Demonstrate recovery process at 250-L scale

❖ Development Program

- Defined key parameters for strain robustness
- Defined a balanced medium
- Optimized fermentation operation to achieve high cell density and high product titer
- Validated product recovery through liquid/liquid extraction using Robatel Centrifugal Extractor
- Successfully run proof of concept trails at 250-L scale and generated process data
- Prepared a package for technology transfer to a manufacturing site



Example 2: *E. coli* Fermentation and Protein Purification for Animal Immunization

❖ Client needs

- Fermentation to make four HIS-tagged proteins
- Cell recovery, protein isolation and purification

❖ Service Program

- Client provided recombinant *E. coli* strains
- BTR performed fermentation at 14-liter scale using BTR's optimized medium and protocols for high cell density culture and high expression
- Harvested and homogenized cells to isolate one soluble protein and three protein from inclusion bodies
- Purified proteins: > 100 mg at >80% purity



Example 3: *Streptomyces* Strain Screening and Validation for Secondary Metabolite Production

❖ Client needs

- Screen and validate *Streptomyces* strains producing a secondary metabolite
- Scale-up a fermentation process with best strain(s).

❖ Development Program

- Screened ~30 strains in 1-liter fermentors
- Validated 4 top strains in 14-liter fermentors
- Selected the best strain to develop, optimize, and scale-up a fermentation process at the 1-L and 14-L scales
- Demonstrate the best process and strain at the 250-L scale
- Provide client with culture broth from each fermentor

