

## Upstream BioSolutions LLC

*Finding the solutions to your  
BioProcessing challenges*

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Upstream BioSolutions provides consulting services related to the development and scale-up of upstream bioprocesses. Founder Bruce L. Zamost provides innovative solutions to clients who need assistance with the development of manufacturing processes for the production of microbial or cell culture derived products. These products can include biopharmaceuticals, biological insecticides or specialty enzymes.

Upstream BioSolutions services range from technical support to development in the following areas:

- Microbial fermentation process development for a range of genetically modified organisms including *E. coli*, *Pichia pastoris*, *Pichia methanolica* and *Saccharomyces cerevisiae*,
- Microbial fermentation development for *Bacillus* species and fungi such as *Trichoderma* and *Aspergillus*,
- Mammalian cell culture process development using CHO cells,
- Strain selection and media optimization for microbial and mammalian processes,
- Cell harvest and clarification by continuous centrifugation,
- Recovery and refolding of inclusion bodies from *E. coli*, and
- Scale – up and technology transfer for all upstream processes.

Bruce has over 25 years experience in the development of production processes for biopharmaceuticals, specialty enzymes and other fermentation derived products. Bruce has taken products from the lab bench through large scale industrial manufacturing. He has recently played a major role in the development and scale-up of two new microbial derived biopharmaceuticals, rIL-21 and rPEG Interferon  $\lambda$  -1, that have shown great promise in clinical trials. Bruce has also worked on developing innovative cell culture processes for the manufacture of monoclonal antibodies and antibody like molecules.

Bruce Zamost received his B.A. in Microbiology from Southern Illinois University in Carbondale. Bruce also attended graduate school at SIU, earning a M.S. in Biological Sciences. His graduate work on the production of cellulases by *Trichoderma reesei* led to a position with Novo Labs (Novozymes) working on fungal and bacterial enzyme production. Bruce was one of a hand full of scientists selected to start Novo Nordisk Entotech in Davis CA, working on the commercial development of biological insecticides. Bruce has spent the last 15 years with ZymoGenetics managing a group of scientists working on the upstream development of production processes for new biopharmaceuticals. Over his career, Bruce has regularly consulted with other bioprocess scientists to help provide solutions to their challenges.