

I am an independent consultant with 30+ years experience as in industrial fermentation microbiologist. Key highlights include:

- Piloting and Commercialization of the Natureworks/Cargill lactic acid fermentation to provide feedstock for the production of PLA (poly-lactic acid), a biodegradable, renewable derived polymer.
- Fermentation Development and proof of concept scale-up of the Genomatica 1,4 BDO process in a previously mothballed amino acid plant in Italy.
- Piloting and tolling out production of unnatural amino acids and derivatives as pharmaceutical intermediates at NSC technologies, an offshoot from Nutrasweet
- Piloting in and contract research development as the primary fermentation hands-on resource at MBI
- Management of external relationships and tech transfer in both directions (in at MBI, out to multiple piloting providers over my career)
- Team leadership including group lead and group director level of groups on the order of 10-15 individuals. I have had the opportunity to mentor dozens scientist and engineers who have gone on to filling key roles throughout the industry.
- Integration upstream with strain development focusing on physiology and downstream with product recovery. MBI was often under-staffed which enabled the opportunity to learn and operate various unit ops.
- Production and utilization of biomass sugars at Renmatix. Led sugar purification efforts and worked with downstream customers and partners to tailor the product to the specific application.

What can I contribute to your project?

- Fermentation development guidance, tech transfer and scale-up including on-site support at the CMO
- Mentorship of your staff to learn how to develop and implement scale-ready technology
- Expertise with a wide variety of yeast, bacteria, and fungi. Fully aerobic, micro-aerobic and anaerobic fermentations. Complex feed strategies. High cell density operations.
- Extensive experience with contamination and mitigation, including phage
- Business and technical discussions with external scale-up providers
- Interview staff as you build your team (recently helped evaluate a group director hire)
- Help you coordinate with other functions including strain dev., analytical, downstream, and engineering
- Analyze data and mentor data analysis from lab to full-scale data
- Troubleshoot and assist with optimization of your process at any scale
- Network with other resources that may be able to assist with the project

Recent Client Work

- Scale-up of complex pathway to produce a biochemical in *E. coli*. Functioned as part of the project team providing input on strain development and physiology. Worked extensively at a CMO site to over see operations and manage scale-up runs.
- Optimizing of a commercial scale fermentation process through increased data collection, data review, and improved seed operations.
- Lab development, team development, tech transfer and initial scale-up a novel protein bioproduct produced in both yeast and bacteria.
- Currently working on two different solid state fermentation projects, one involving film growth on substrate particles and the other a tray fermentation process to produce biomass.