

## Trends in Industrial Biotechnology

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Chemgineering is an engineering partner for clients in the pharma, biotech, food, cosmetics, and fine chemicals sector, designing production facilities based on our client's processes. As such, Chemgineering closely follows trends in the industry. Recent developments in the biotech process developments, in particular those that have major implications on facility design will be addressed.

Three trends can be seen in the red biotech area

- Process intensification
- Scaling out (ATMPs)
- sustainability aspects are being discussed during early stages of process design

Novel foods such as cultured meat, and microbial protein production, also termed precision fermentation, have renewed interest in large scale fermentation.

The major challenges in Europe are that only few usable large-scale fermentation facilities have survived the development of moving the bulk productions to India and China, and that the know-how of operating such facilities has largely been lost. In addition, the costs for setting up a green or brown field production as a commercially viable scale is similar to those for setting up a high value biopharmaceutical production.

Finally, regulatory hurdles have to be taken, before a novel protein/food is approved as safe for human consumption.