

# Mammalian Cell Culture Optimization

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## BACKGROUND

Biotherapeutic proteins manufactured in cell culture systems have transformed modern medicine. Selling many tens of billions per year, new biotherapeutics such as monoclonal antibodies have delivered dramatic clinical results, while posing significant manufacturing problems. During the cell culture manufacturing process, toxic bioproducts such as lactate and ammonia have posed considerable challenges in bioprocessing, since they limit cell growth and impact critical quality attributes of recombinant protein production (e.g., therapeutic drugs, enzymes). That is because the lactate alters the regulation of biosynthetic enzymes, and can lead to changes in pH in the culture. To mitigate the negative effects of lactic acid accumulation and control the culture pH, chemical 'base' is added to the media during the course of a bioprocess. However, the base addition negatively impacts the bioprocess by inhibiting growth and shortening the length of time in which the cells can produce the recombinant protein. This leads to reduced yield, and increased cost-of-goods. Thus, it is of great interest to eliminate lactate production, and UC San Diego researchers have recently developed a new process for achieving this.

## TECHNOLOGY DESCRIPTION

UC San Diego researchers have developed a patent-pending technology that addresses this need by demonstrating a method to completely eliminate lactate production via a homozygous knockout of lactate dehydrogenase. The method (and resultant cell line) will be invaluable to companies using mammalian cells for biotherapeutic protein production, as it represents a simple way to increase protein production, directly affecting biotherapeutic product cost-of-goods

## PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Published Application	2019-0256824	08/22/2019	2016-222

## CONTACT

University of California, San Diego  
Office of Innovation and  
Commercialization  
[innovation@ucsd.edu](mailto:innovation@ucsd.edu)  
tel: 858.534.5815.



## OTHER INFORMATION

### KEYWORDS

Biotherapeutics, cell culture,  
biomanufacturing, process  
optimization

### CATEGORIZED AS

- ▶ **Biotechnology**
  - ▶ Industrial/ Energy
- ▶ **Research Tools**
  - ▶ Cell Lines
  - ▶ Protein Synthesis

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