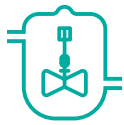


BIOPROCESS DEVELOPMENT



DEVELOPMENT AND SCALE UP OF MICROCARRIER BASED PROCESSES

The use of the microcarrier technology allows to scale up a process using adherent cells without multiplying the number of static containers thus optimizing Upstream Process footprint.

The use of Stirred tank bioreactors also improves the process control and reduces the risk of process failure.

CELL CULTURE USING MICROCARRIERS

When choosing a microcarrier based process two challenges arise:

- Promotion of cell adhesion and growth on microcarriers
- Parametrization of the scale up of the process

We drive process development experiments which allow us to define conditions to promote cell growth and viral production.

The scale up requires a series of seed train bioreactors to amplify cells from one bioreactor to another.

A dissociation procedure has to be defined during process development, looking at critical parameters for detachment of the cells from the microcarriers and effectively reseeding the forthcoming bioreactor.

THE 4 KEY STEPS

Requirements:

- 1- Controlled cell growth in static container
- 2- Viral production base line



The process can be scaled up when USP, DSP processes and a dissociation procedure are defined.

To ensure the success of the scale up, it is necessary to:

- Have a good understanding and knowledge of the process
- Use bioreactor technologies that are fully scalable by respecting the scale up parameters in bioreactors

To scale up Requirements:

- 1- Defined USP & DSP processes
- 2- Controlled dissociation procedure