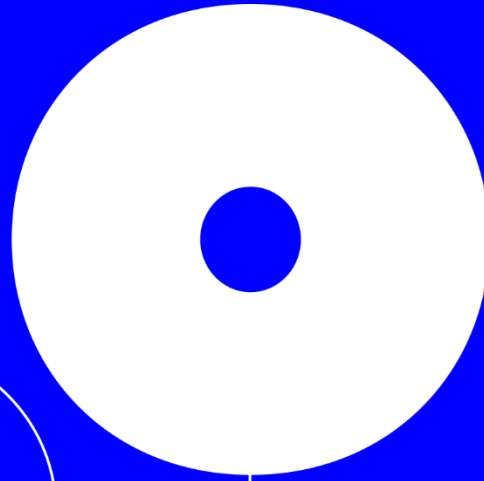


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OCTOBER 2021



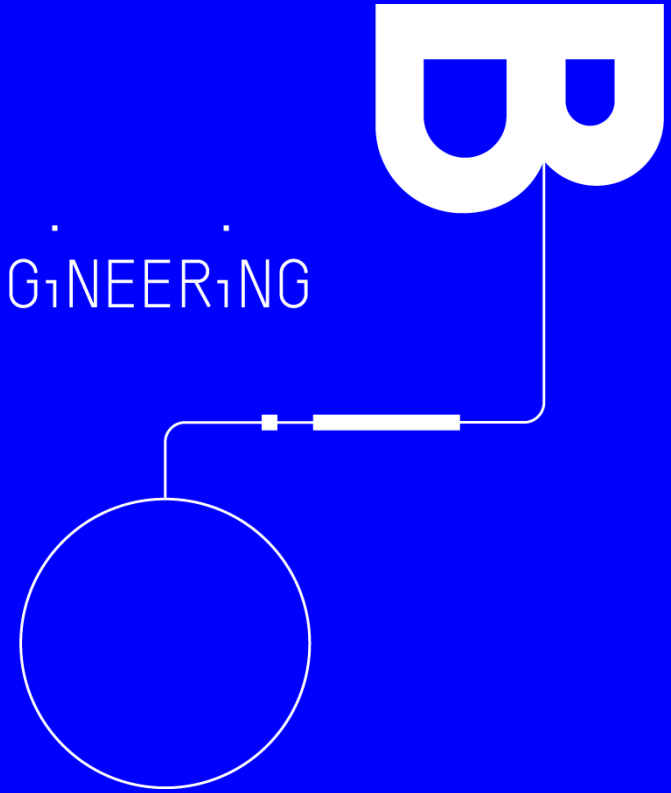
RAPIDLY INCREASE
MANUFACTURING OUTPUT
BY LEVERAGING
EXISTING FACILITIES

B₁OEN₁NEER₁NG

dcvmmn

Developing Countries Vaccine
Manufacturers Network

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BIOENGINEERING

Facilitating Manufacturing Ramp-up

YOUR PARTNER FROM RESEARCH TO COMMERCIAL PRODUCTION

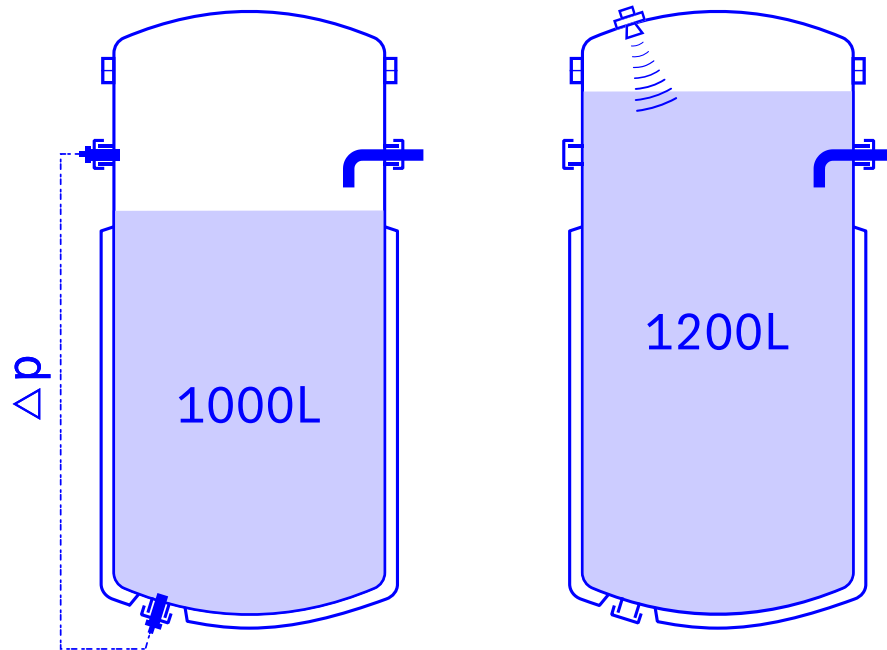


MANY SOLUTIONS POSSIBLE

TWO EXAMPLE CASES

INCREASE THE PRODUCTION VOLUME OF EXISTING VESSELS

Increasing volume from e.g. 1000L to 1200L:

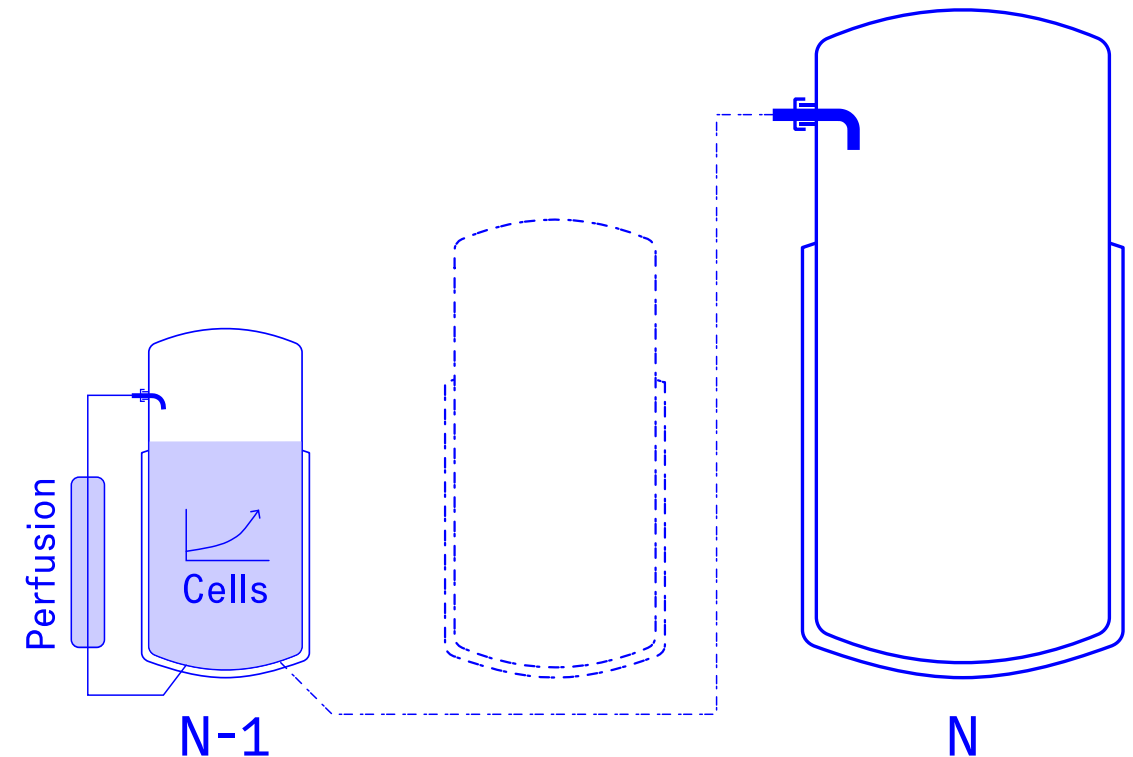


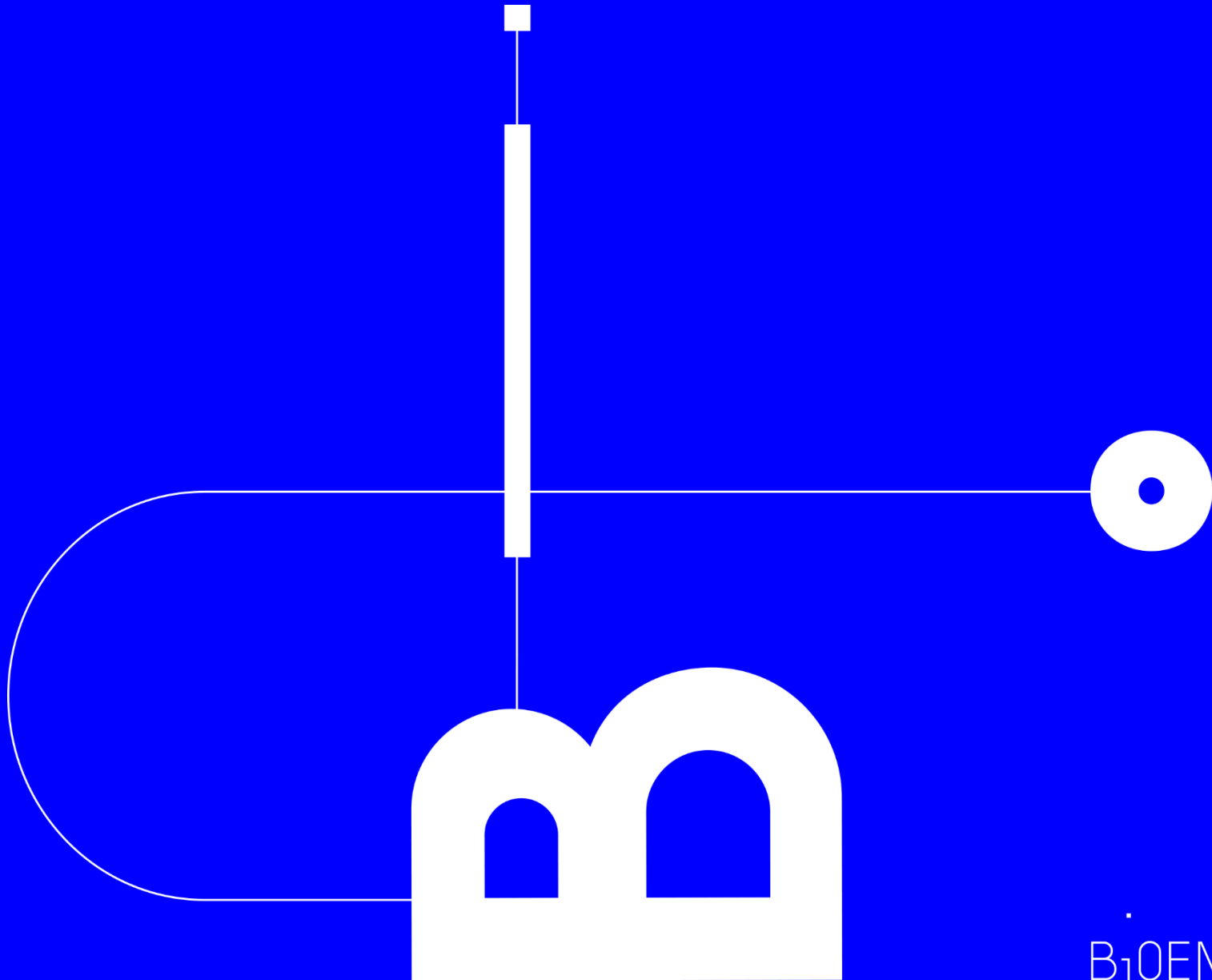
- Re-calculate heat transfer, aeration and agitation
- Modify the over fill protection
- QA should be involved from the beginning to secure proper re-qualification/validation

INCREASE THE CELL DENSITY

- Small scale reactor (30L) with perfusion system to increase the cell density
- Use the «new» N-1 perfusion bioreactor to directly inoculate the production bioreactor
- Higher cell density has impact on the physical properties of the media e.g. viscosity, heat transfer etc.
=> re-calculate the equipment. Agitation and aeration is critical

- Re-build the transfer panel and the former seed bioreactors to increase the amount of production bioreactors





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