

# Increase titer and improve product quality using perfusion culture

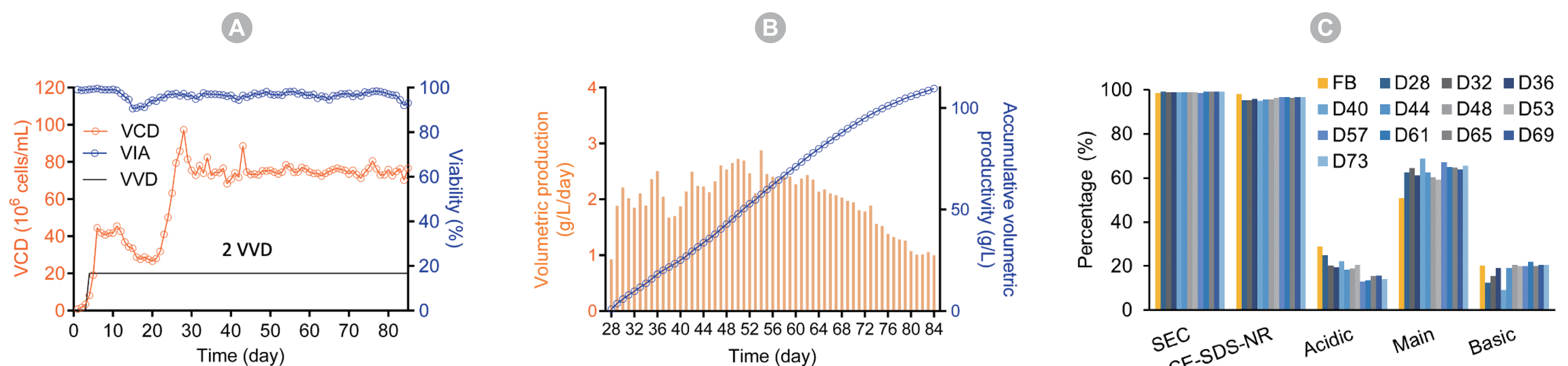
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## Abstract

Issues like low yield, aggregation, fragmentation, charge variant and hard to purify impurities are frequently found in upstream process for different types of biologics. Perfusion process can promote cell growth and improve product quality. In perfusion process, fresh media is pumped into bioreactor and product-containing media is exchanged out. In GenScript ProBio platform, two modes of perfusion culture were established to better produce unstable molecules and molecules associates with hard to purify impurities.

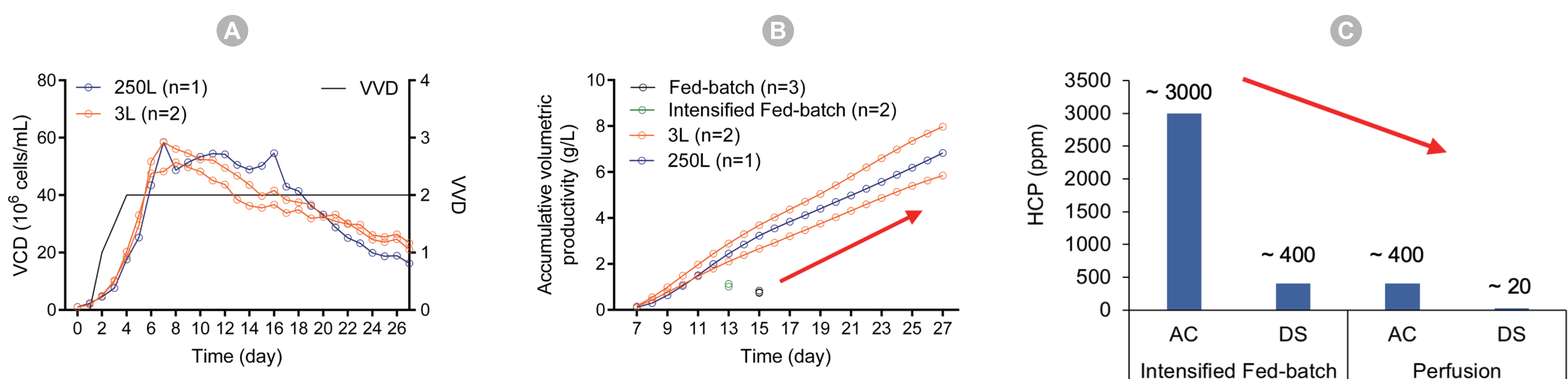
Items	Static perfusion	Dynamic perfusion
Cell bleeding	YES	NO
Loss of cell and product yield	YES	NO
Operation	More complicated	Less complicated
Culture duration	Long (30 – 100 days)	Short (18 – 30 days)
Cell viability	Maintained well through out the culture	Decreased in the late stage of culture

## Static perfusion



- Culture duration was up to 84 days.
- The VCD and viability were maintained well at the static phase.
- Productivity was about 28 times of traditional FB (4 g/L vs 110 g/L).
- Perfusion showed higher main peak of iCIEF and lower acidic species.
- The quality attributes were stable during the static phase.

## Dynamic perfusion



- Culture duration was up to 27 days.
- Productivity was about 10 times of traditional FB (0.78 g/L vs 7.7 g/L).
- HCP of DS was decreased from 400 ppm to 20 ppm.