

9-17-2017

Development of a scale down toolbox for perfusion process development

Jean-Marc Bielser

Merck KGaA, Switzerland, jean-marc.bielser@merckgroup.com

Follow this and additional works at: http://dc.engconfintl.org/biomanufact_iii



Part of the [Engineering Commons](#)

Recommended Citation

Jean-Marc Bielser, "Development of a scale down toolbox for perfusion process development" in "Integrated Continuous Biomanufacturing III", Suzanne Farid, University College London, United Kingdom Chetan Goudar, Amgen, USA Paula Alves, IBET, Portugal Veena Warikoo, Axcella Health, Inc., USA Eds, ECI Symposium Series, (2017). http://dc.engconfintl.org/biomanufact_iii/ 53

This Abstract and Presentation is brought to you for free and open access by the Proceedings at ECI Digital Archives. It has been accepted for inclusion in Integrated Continuous Biomanufacturing III by an authorized administrator of ECI Digital Archives. For more information, please contact franco@bepress.com.

SCALE-DOWN TOOLBOX FOR PERFUSION PROCESS DEVELOPMENT

MERCK

Jean-Marc Bielser^{1,2}, Jakub Domaradzki¹, Jonathan Souquet¹, Massimo Morbidelli², Hervé Broly¹

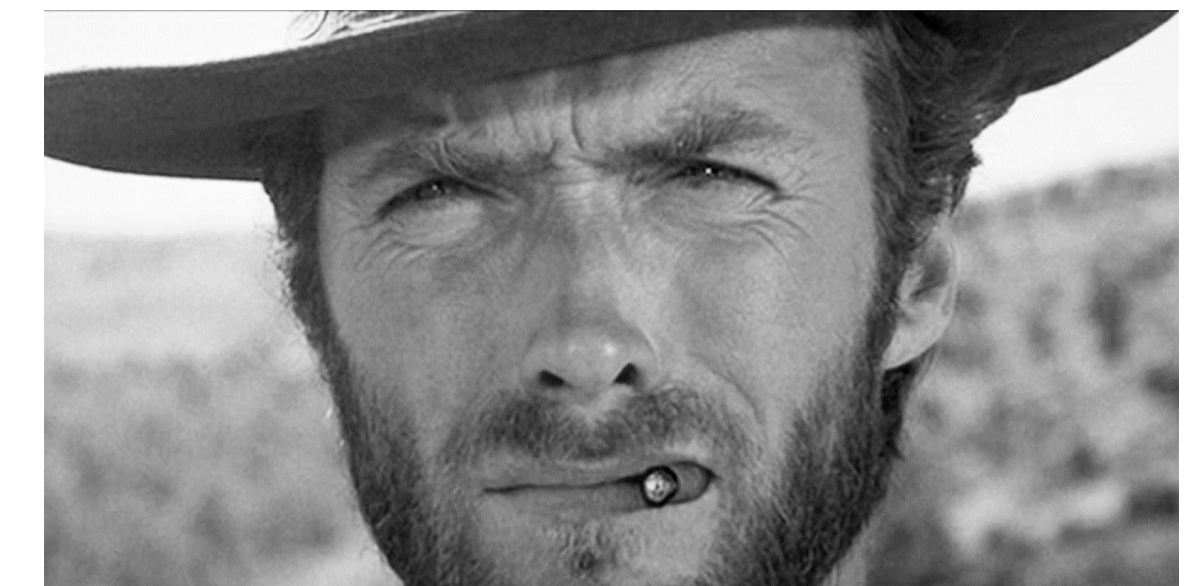
¹Biotech Process Sciences, Merck KGaA, Corsier-sur-Vevey, Switzerland

²Institute of Chemical and Bioengineering, ETH Zürich, Zürich, Switzerland

ETH zürich

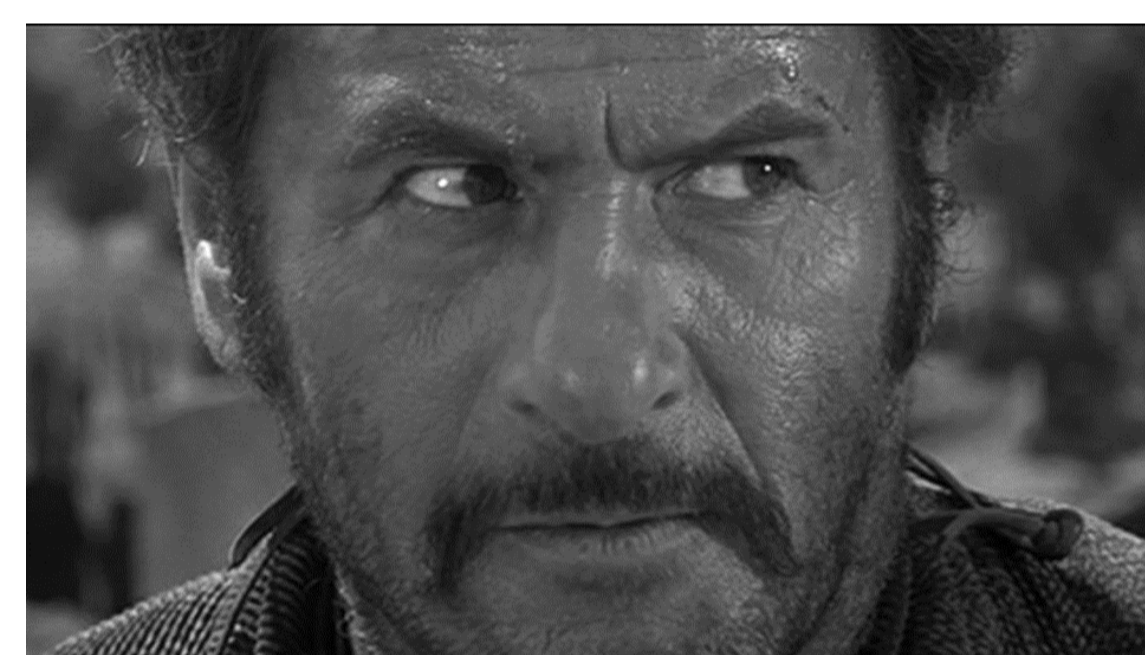
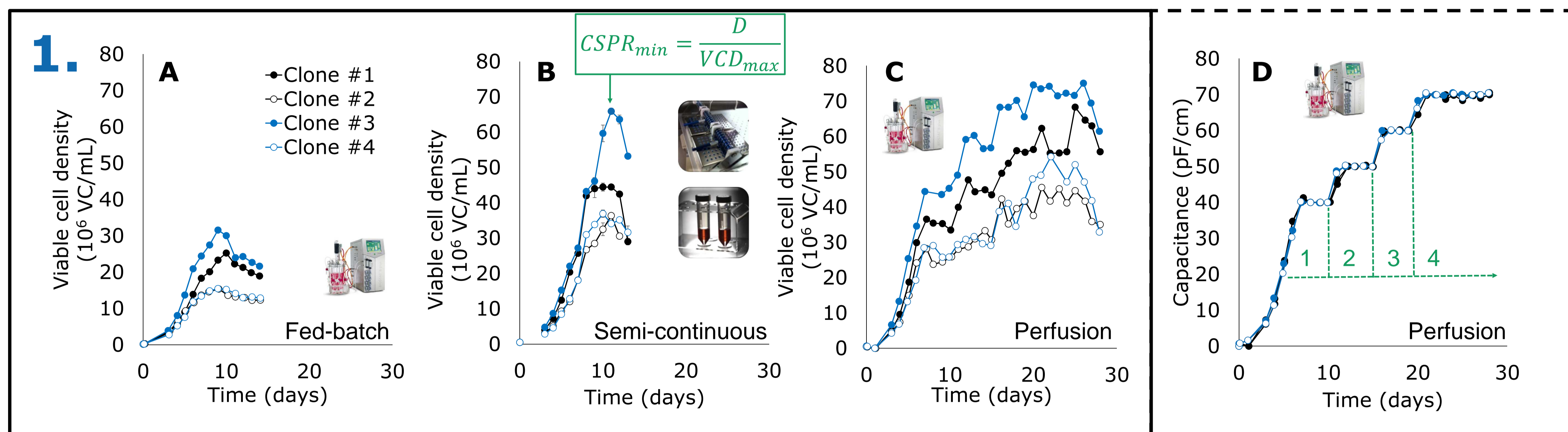


The good, the bad and the ugly... clone in perfusion



You mean you can use **scale down semi-continuous system** to assess the performance of a perfusion process?

Yes, I compared my results with a **push-to-low^a** approach using a **lab-scale perfusion bioreactor!**



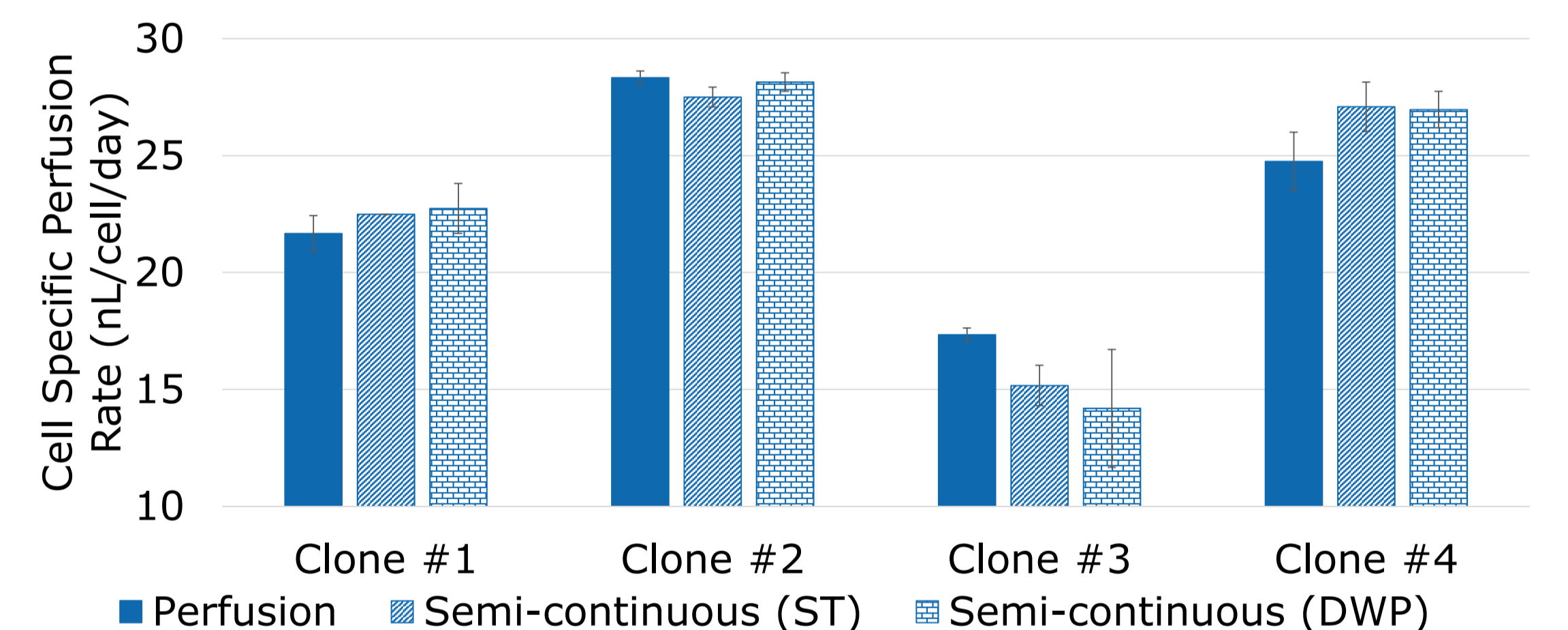
He is right, from the semi-continuous experiment it is possible to

2. Predict $CSPR_{min}$
3. Estimate volumetric productivities

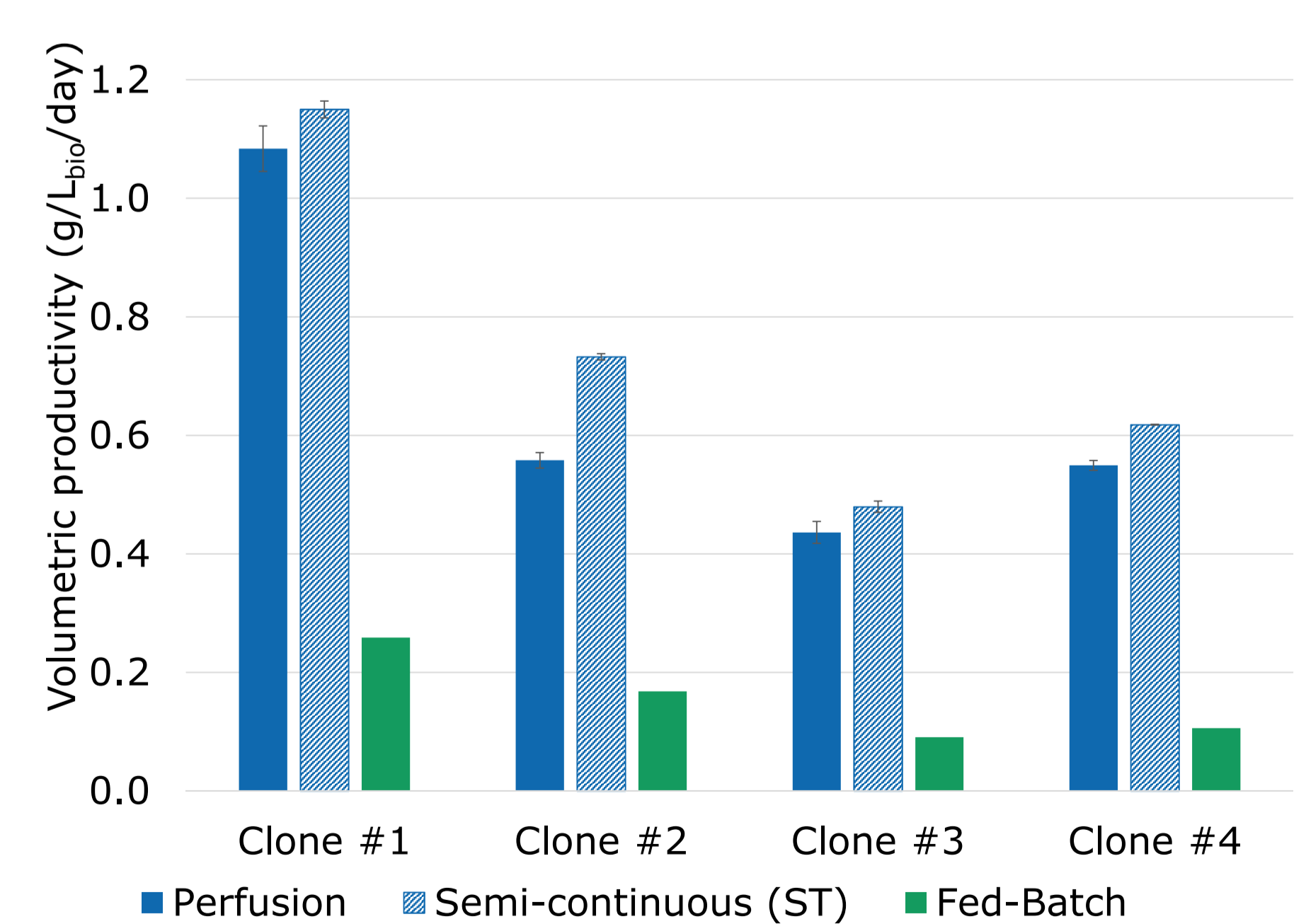
Stable operation was achieved using the capacitance signal

4. Impact on growth and productivity

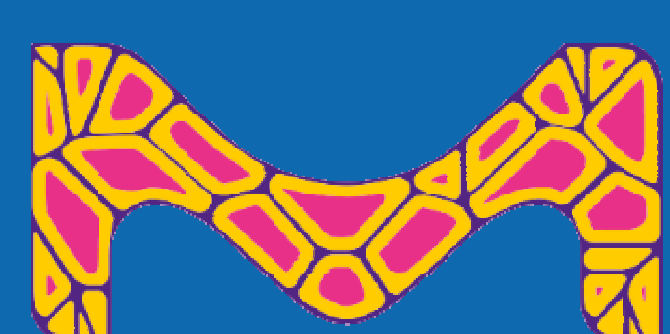
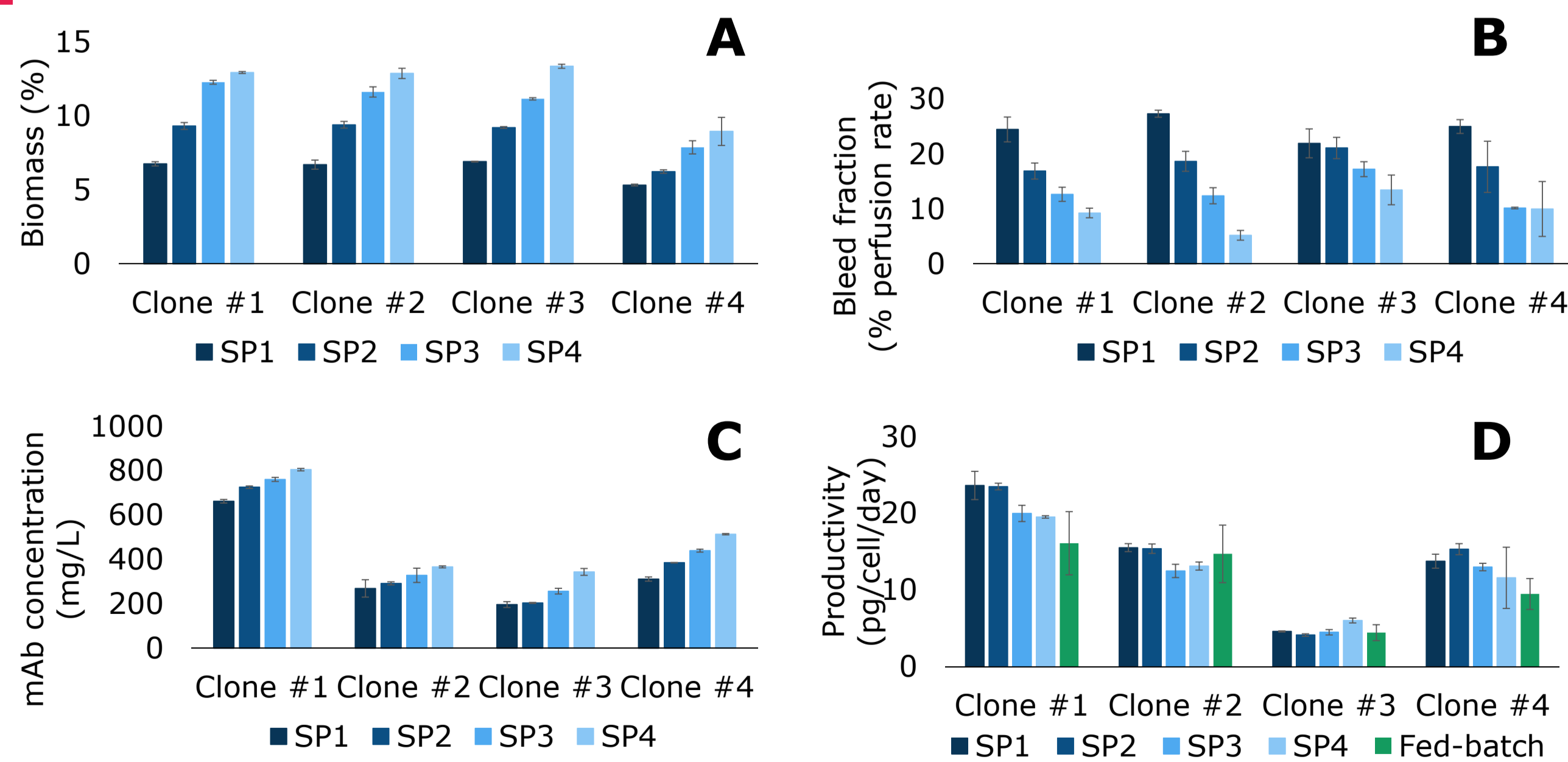
2. Determination of $CSPR_{min}$ across scales



3. Volumetric productivity comparison



4. Perfusion set-points



a. Konstantinov K., Goudar C., Ng M., Meneses R., Thrift J., Chuppa S., Matangiyan C., Michaels J., Naveh D., The "Push-to-Low" Approach for Optimization of High-Density Perfusion Cultures of Animal Cells. *Adv Biochem Engin/Biotechnol.* **101**, 75-98 (2006)
 b. Rouiller A. Y., Bielser J.-M., Brühlmann D., Jordan M., Broly H. & Stettler M., Screening and assessment of performance and molecule quality attributes of industrial cell lines across different fed-batch systems. *Biotechnol. Prog.* **32**, 160-170 (2015).