

Engineering Conferences International ECI Digital Archives

Integrated Continuous Biomanufacturing III

Proceedings

9-17-2017

Development and application of screening scale bioreactor systems for very high cell density perfusion of mammalian cells

Caijuan Zhan

KTH - Cell Technology Group (CETEG), Sweden

Hubert Schwarz

KTH - Cell Technology Group (CETEG), Sweden

Magnus Lundqvist

KTH - Cell Technology Group (CETEG), Sweden

Atefeh Shokri

KTH - Cell Technology Group (CETEG), Sweden

Ray Field

BioPharmaceutical Development, MedImmune, Cambridge, UK.

See next page for additional authors

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

 Part of the [Engineering Commons](http://dc.engconfintl.org/biomanufact_iii)

Recommended Citation

Caijuan Zhan, Hubert Schwarz, Magnus Lundqvist, Atefeh Shokri, Ray Field, Richard Turner, Mathias Uhlén, Johan Rockberg, and Veronique Chotteau, "Development and application of screening scale bioreactor systems for very high cell density perfusion of mammalian cells" 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/52

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.

Authors

Caijuan Zhan, Hubert Schwarz, Magnus Lundqvist, Atefeh Shokri, Ray Field, Richard Turner, Mathias Uhlén, Johan Rockberg, and Veronique Chotteau

Development and application of screening scale bioreactor systems for very high cell density perfusion of mammalian cells

Caijuan Zhan^{1,4}, Hubert Schwarz^{1,4}, Ye Zhang^{1,4}, Atefeh Shokri^{1,4,6}, Ray Field³, Richard Turner³, Johan Rockberg^{2,4,5}, Veronique Chotteau^{1,4,6}

¹ KTH - Cell Technology Group (CETEG), Div. of Industrial Biotechnology, School of Biotechnology, SE-10691, Stockholm, Sweden

² KTH - Royal Institute of Technology, Dept. Proteomics & Nanobiotechnology, SE-10691 Stockholm, Sweden

³ BioPharmaceutical Development, MedImmune, Cambridge, UK

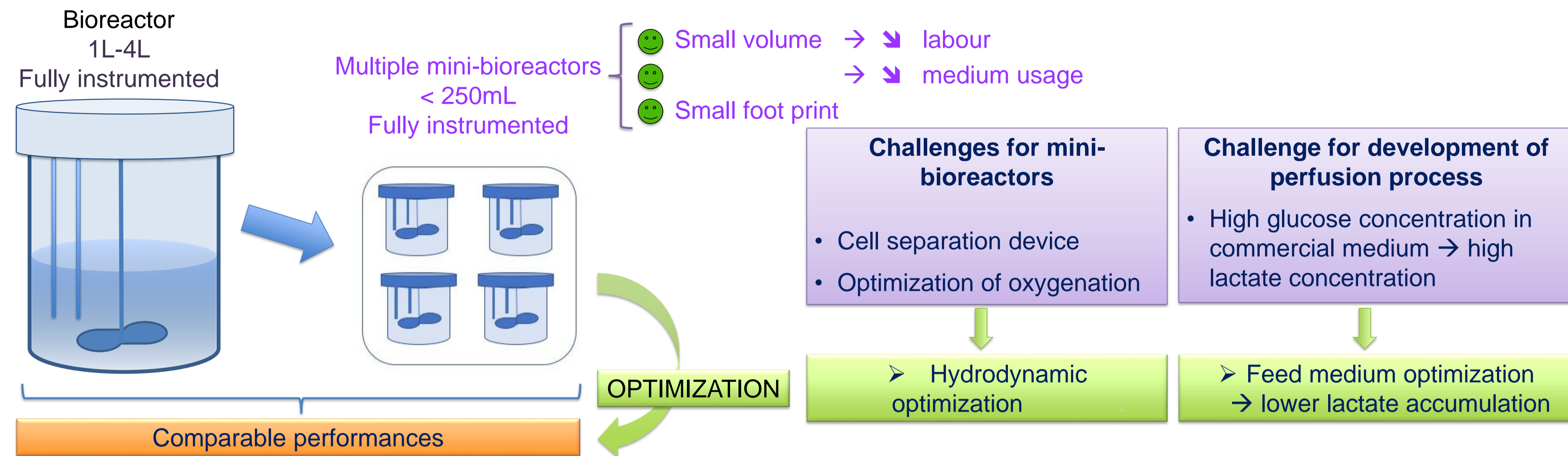
⁴ Wallenberg Centre for Protein Research (WCPR)

⁵ NovoNordisk Center for Biosustainability (NNF CFB) Processing

⁶ AdBIOPRO, Competence Centre for Advanced Bioproduction by Continuous Processing

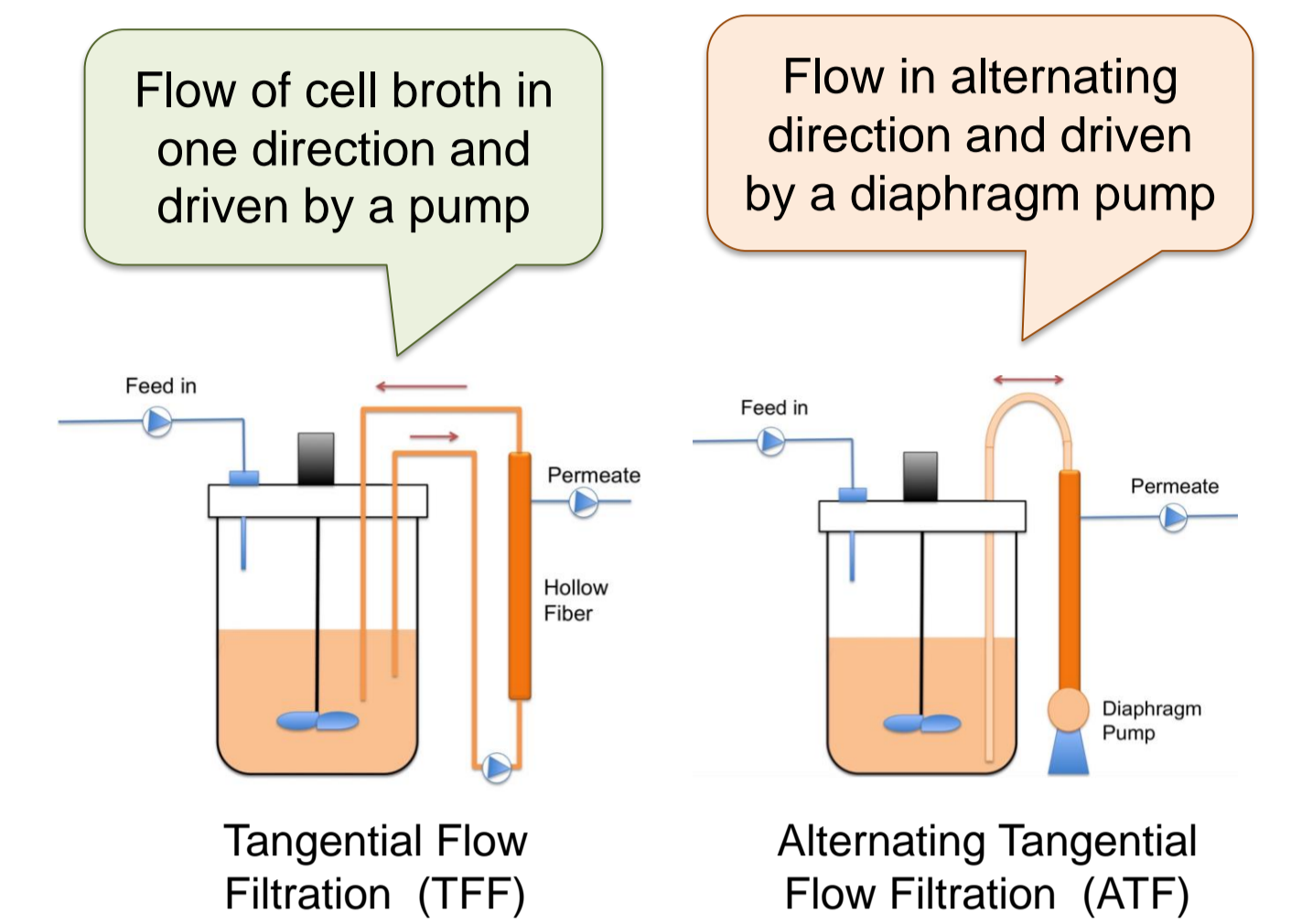
INTRODUCTION

Perfusion culture in mini-bioreactors



Mini-bioreactors

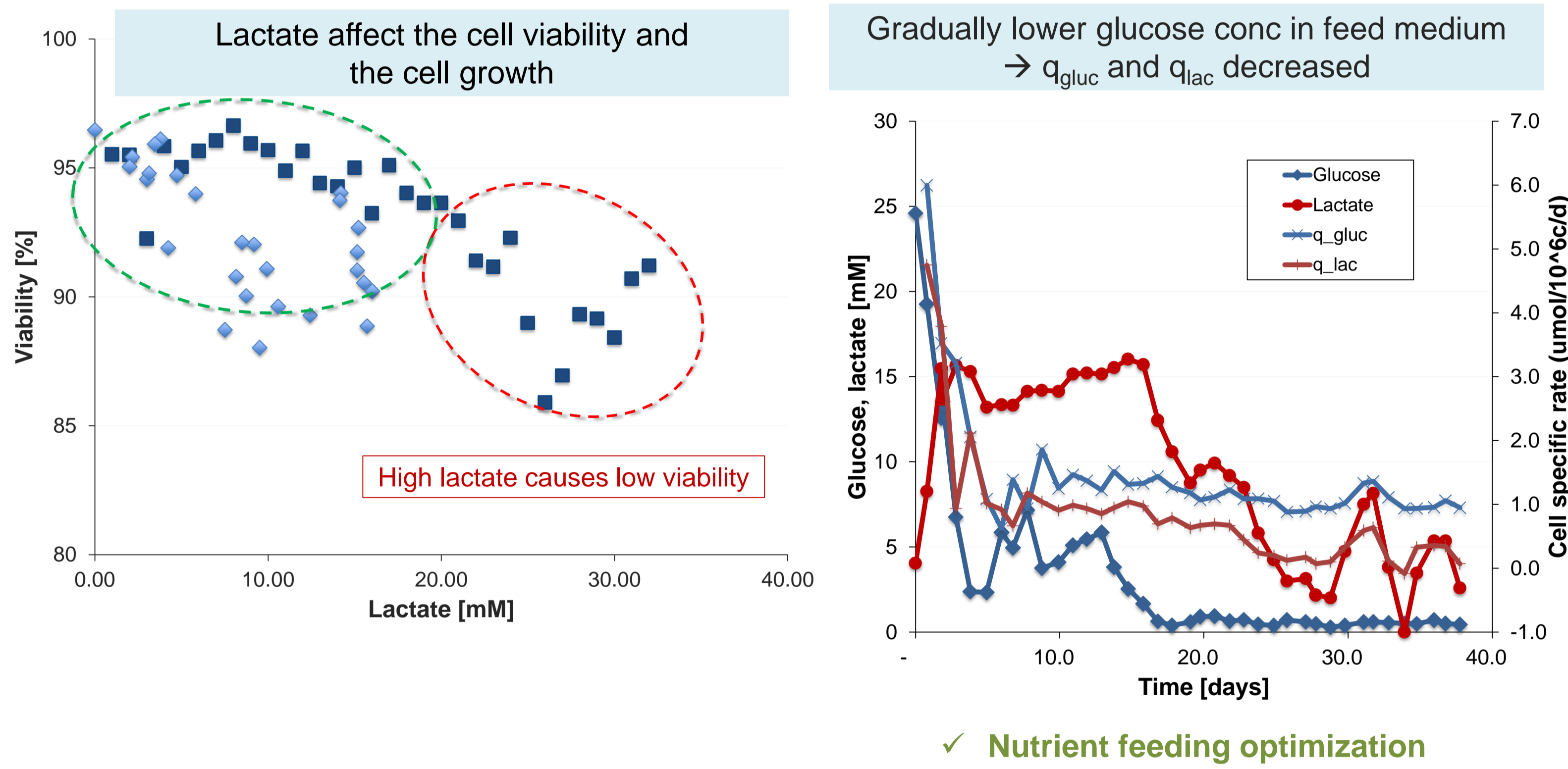
Cell separation device



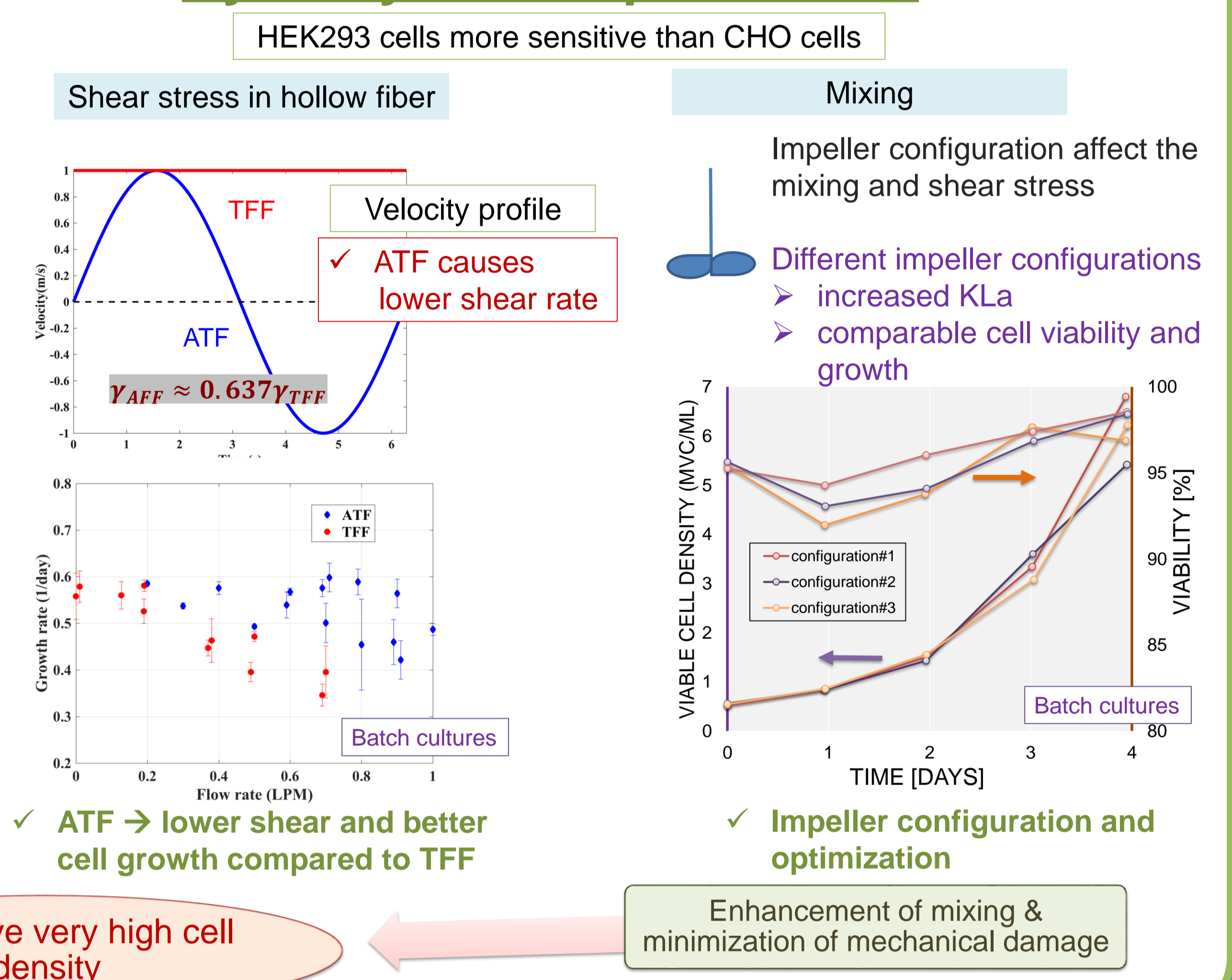
Tangential flow filtration

OPTIMIZATION

Feed medium optimization



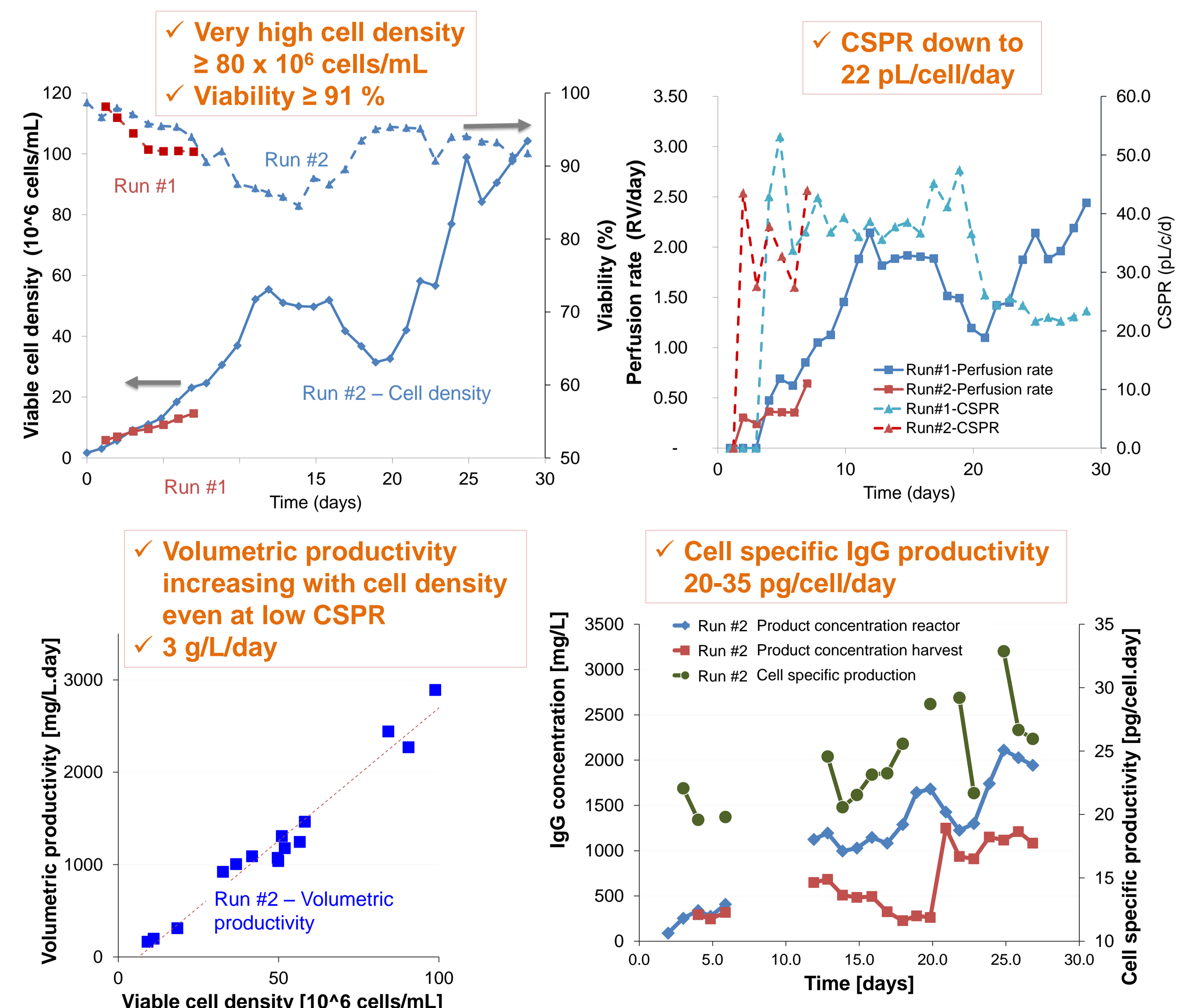
Hydrodynamic optimization



HEK293 cells

APPLICATION

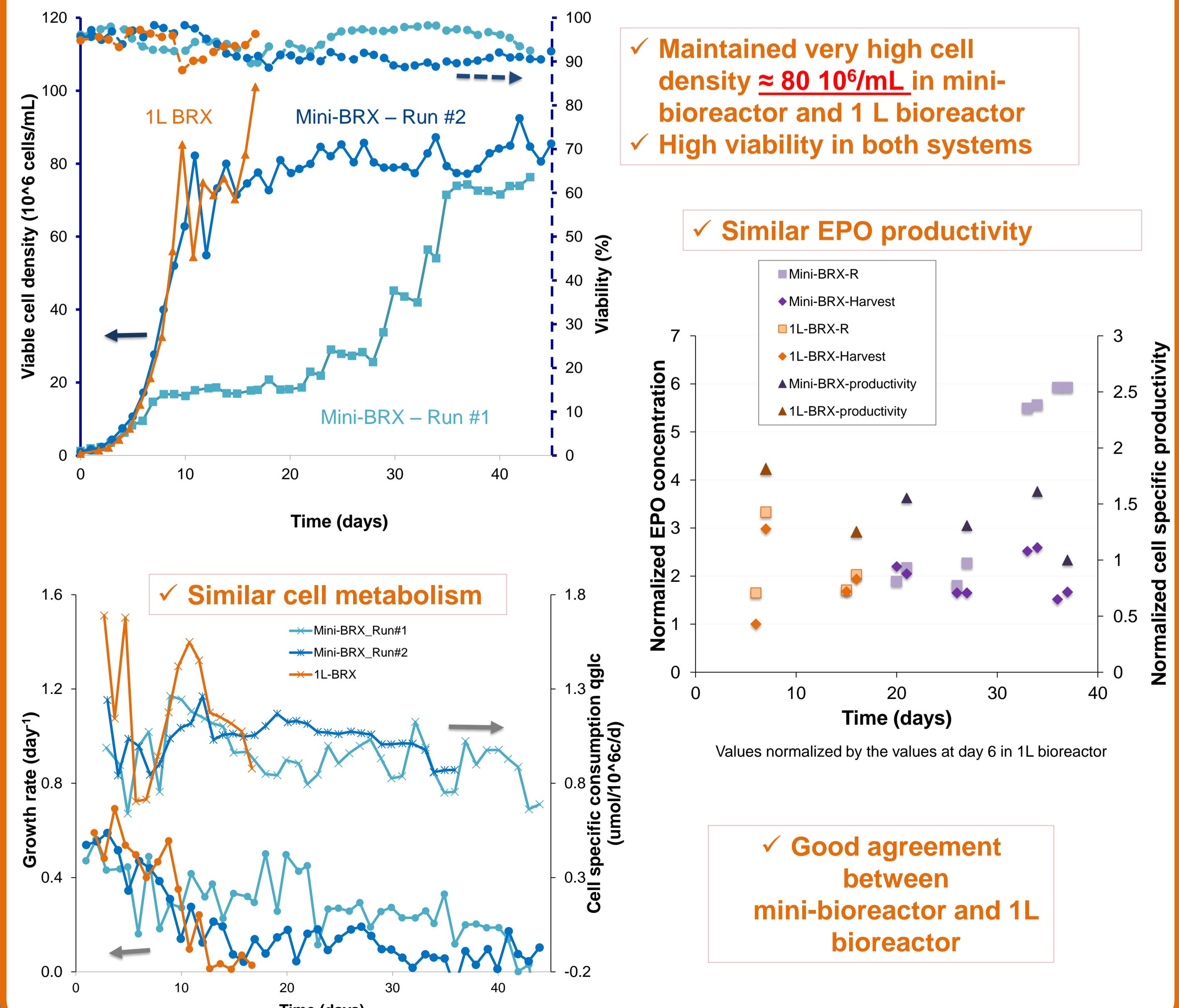
Perfusion with tangential flow filtration in mini-bioreactor



CHO-M cells (Selexis) PM8 Prototype Medium (Thermo Fisher Scientific)

APPLICATION

Perfusion with tangential flow filtration in mini-bioreactor & 1L bioreactor



HEK 293 cells (KTH) BalanCD HEK293 medium (Irvine Scientific)

Acknowledgements

This work was supported by the Knut and Alice Wallenberg Foundation, Sweden, and by MedImmune, AstraZeneca, UK. We thank Thermo Fisher Scientific, USA, for kindly providing PM8 prototype medium and Irvine Scientific, USA, for advices, as well as Selexis/JSR, Switzerland, for the CHO-M cell line.