

Author's Accepted Manuscript

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PII: S0376-7388(16)31842-7
DOI: <http://dx.doi.org/10.1016/j.memsci.2017.08.036>
Reference: MEMSCI15502

To appear in: *Journal of Membrane Science*

Received date: 4 October 2016
Revised date: 12 July 2017
Accepted date: 14 August 2017

Cite this article as: Bárbara Cunha, Ricardo J.S. Silva, Cláudia Correia, Alexey Koshkin, Paula M. Alves, Margarida Serra, Cristina Peixoto and Manuel J.T. Carrondo, Finding the design space of a filtration-based operation for the concentration of human pluripotent stem cells, *Journal of Membrane Science*, <http://dx.doi.org/10.1016/j.memsci.2017.08.036>

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Finding the design space of a filtration-based operation for the concentration of human pluripotent stem cells

Bárbara Cunha^{a,b*1}, Ricardo J.S. Silva^{a,b*1}, Cláudia Correia^{a,b}, Alexey Koshkin^{a,b}, Paula M.

Alves^{a,b}, Margarida Serra^{a,b}, Cristina Peixoto^{a,b}, Manuel J. T. Carrondo^{b,c}

^aInstituto de Tecnologia Química e Biológica António Xavier, Universidade Nova de Lisboa, Av. da República, 2780-157 Oeiras, Portugal

^biBET, Instituto de Biologia Experimental e Tecnológica, Apartado 12, 2780-901 Oeiras, Portugal

^cDepartamento de Química, Faculdade de Ciências e Tecnologia, Universidade Nova de Lisboa, 2829-516 Monte da Caparica, Portugal.

*Corresponding author. Ricardo J. S. Silva, PhD; iBET, Instituto de Biologia Experimental e Tecnológica, Apartado 12, 2780-901 Oeiras, Portugal. Tel.: +351 21 446 94 58; Fax: +351 21 442 11 61.

bcunha@itqb.unl.pt

rsilva@ibet.pt

ccorreia@itqb.unl.pt

akoshkin@itqb.unl.pt

marques@itqb.unl.pt

mserra@itqb.unl.pt

peixoto@itqb.unl.pt

mjtc@itqb.unl.pt

Abstract

Process knowledge for designing robust and reproducible unit operations is essential, especially for complex biological systems. This work describes a shortcut approach for the design of tangential flow filtration for the concentration of human induced pluripotent stem cells (hiPSC), supported by design of experiments. Critical process parameters (CPP) of shear rate, permeate flux and cell load were considered, and their impact on hiPSC recovery yield and viability was studied. A full factorial design confirmed significant interaction effects between all CPP, affecting both responses. The developed statistical model predicted that high shear rate (3000 s^{-1}), permeate flux (250 LMH) and medium cell load ($2 \times 10^6 \text{ cell/cm}^2$)

¹ Equal contribution

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