Selected Publications of Dr. Eric von Lieres

Peer-Reviewed Journals

1. Diedrich, J.; Heymann, W.; Leweke, S.; Kunert, C.; Johnson, W.; Hunt, S.; Todd, B.; von Lieres, E.: *Multi-state steric mass-action model and case study on complex high loading behavior of mAb on ion exchange tentacle resin*, Journal of Chromatography A, accepted.
2. Freier, L.; von Lieres, E.: *Robust multi-objective global optimization of stochastic processes with a case study in gradient elution chromatography*, Biotechnology Journal, accepted.
3. Hemmerich, J.; Freier, L.; Wiechert, W.; von Lieres, E.; Oldiges, M.: *Generic protocol for optimization of heterologous protein production using automated microbioreactor technology*, Journal of Visualized Experiments, accepted.
4. Freier, L.; Wiechert, W.; von Lieres, E.: *Kriging with trend functions nonlinear in their parameters: Theory and application in enzyme kinetics*, Engineering in Life Sciences **17,8** (2017), 916–922.
5. Freier, L.; von Lieres, E.: *Multi-objective global optimization (MOGO): Algorithm and case study in gradient elution chromatography*, Biotechnology Journal **12,7** (2017), 1600613.
6. Westerwalbesloh, C.; Grünberger, A.; Wiechert, W.; Kohlheyer, D.; von Lieres, E.: *Coarse graining bacteria colonies for modeling critical solute distributions in pico-liter bioreactors for bacterial studies on single-cell level*, Microbial Biotechnology **10,4** (2017), 845–857.
7. Zhao, X.; Noack, S.; Wiechert, W.; von Lieres, E.: *Dynamic flux balance analysis with nonlinear objective function*, Journal of Mathematical Biology (April 11, 2017), 1–29.
8. Bühler, J.; Huber, G.; von Lieres, E.: *Finite volume schemes for the numerical simulation of tracer transport in plants*, Mathematical Biosciences **288** (2017), 14–20.
9. Morschett, H.; Freier, L.; Rohde, J.; Wiechert, W.; von Lieres, E.; Oldiges, M.: *A framework for accelerated phototrophic bioprocess development: Integration of parallelized microscale cultivation, laboratory automation and Kriging-assisted experimental design*, Biotechnology for Biofuels **10,26** (2017), 1–13.
10. Poshyvailo, L.; von Lieres, E.; Kondrat, S.: *Does metabolite channeling accelerate enzyme-catalyzed cascade reactions?*, PLOS ONE **12,2** (2017), 1–17.
11. Kiefer, J.; Wei, G.; Ciacchi, L. C.; von Lieres, E.: *Irreversible damage of polymer membranes during attenuated total reflection infrared analysis*, Applied Spectroscopy **71,6** (2017), 1–7.
12. Freier, L.; Hemmerich, J.; Schöler, K.; Wiechert, W.; Oldiges, M.; von Lieres, E.: *Framework for Kriging based iterative experimental analysis and design: Optimization of secretory protein production in Corynebacterium glutamicum*, Engineering in Life Sciences **16** (2016): 538–549.
13. Jussen, D.; Soltner, H.; Stute, B.; Wiechert, W.; von Lieres, E.; Pohl, M.: *µMORE: A microfluidic magnetic oscillation reactor for accelerated parameter optimization in biocatalysis*, Journal of Biotechnology **231** (2016), 174–182.
14. Kondrat, S.; Zimmermann, O.; Wiechert, W.; von Lieres, E.: *Discrete-Continuous reaction-diffusion model with mobile point-like sources and sinks*, European Physical Journal E **39,11** (2016), 1–10.

15. Püttmann, A.; Schnittert, S.; Leweke, S.; von Lieres, E.: *Utilizing algorithmic differentiation to efficiently compute chromatograms and parameter sensitivities*, Chemical Engineering Science **139** (2016), 152–162.
16. Leweke, S.; von Lieres, E.: *Fast arbitrary order moments and arbitrary precision solution of the general rate model of column liquid chromatography with linear isotherm*, Computers and Chemical Engineering **84** (2016), 350–362.
17. Kumar, V.; Leweke, S.; von Lieres, E.; Rathore, A.: *Mechanistic modeling of ion-exchange process chromatography of charge variants of monoclonal antibody products*, Journal of Chromatography A **1426** (2015), 140–153.
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19. Westerwalbesloh, C.; Grünberger, A.; Stute, B.; Weber, S.; Wiechert, W.; Kohlheyer, D.; von Lieres, E.: *Modeling and CFD simulation of nutrient distribution in picoliter bioreactors for bacterial growth studies on single-cell level*, Lab on Chip **15** (2015), 4177–4186.
20. Kondrat, S.; Zimmermann, O.; Wiechert, W.; von Lieres, E.: *The effect of composition on diffusion of macromolecules in crowded environment*, Physical Biology **12** (2015), 046003.
21. Ghosh, P.; Lin, M.; Vogel, J. H.; Choy, D.; Haynes, C.; von Lieres E.: *Zonal rate model for axial and radial flow membrane chromatography, part II: Model based scale-up*, Biotechnology and Bioengineering **111,8** (2014), 1587–1594.
22. Püttmann, A.; Nicolai, M.; Behr, M.; von Lieres, E.: *Stabilized space-time finite elements for high-definition simulation of packed bed chromatography*, Finite Elements in Analysis and Design **86** (2014), 1–11.
23. Choy, D.; Creagh, L.; von Lieres, E.; Haynes, C.: *A new mixed-mode model for interpreting and predicting protein elution during isoelectric chromatofocusing*, Biotechnology and Bioengineering **111,5** (2014), 925–936.
24. Ghosh, P.; Vahedipour, K.; Leuthold, M.; von Lieres, E.: *Model-based analysis and quantitative prediction of membrane chromatography: Extreme scale-up from 0.08 ml to 1200 ml*, Journal of Chromatography A **1332** (2014), 8–13.
25. Baraibar, Á.; von Lieres, E.; Wiechert, W.; Pohl, M.; Rother, D.: *Effective production of (S)-α-hydroxy ketones: A reaction engineering approach*, Topics in Catalysis **57,5** (2014), 401–411.
26. Kiefer, J.; Rasul, N. H.; Ghosh, P. K.; von Lieres, E.: *Surface and bulk porosity mapping of polymer membranes using infrared spectroscopy*, Journal of Membrane Science **452** (2014), 152–156.
27. Bühler, J.; von Lieres, E.; Huber, G.: *A family of compartmental models for long-distance tracer transport in plants,* Journal of Theoretical Biology **341** (2014), 131–142.
28. Ghosh, P.; Vahedipour, K.; Lin, M.; Vogel, J. H.; Haynes, C.; von Lieres, E: *Computational fluid dynamic simulation of axial and radial flow membrane chromatography: Mechanisms of non-ideality and validation of the zonal rate model*, Journal of Chromatography A **1305** (2013), 114–122.
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30. Püttmann, A.; Schnittert, S.; Naumann, U.; von Lieres, E.: *Fast and accurate parameter sensitivities for the general rate model of column liquid chromatography*, Computers and Chemical Engineering **56** (2013), 46–57.
31. Borg, N.; Westerberg, K.; Andersson, N.; von Lieres, E.; Nilsson, B.: *Effects of uncertainties in experimental conditions on the estimation of adsorption model parameters in preparative chromatography*, Computers and Chemical Engineering **55** (2013), 148–157.
32. Stute, B.; Krupp, V.; von Lieres, E.: *Performance of iterative equation solvers for mass transfer problems in three-dimensional sphere packings in COMSOL*, Simulation Modelling Practice and Theory **33** (2013), 115–131.
33. Ghosh, P.; Vahedipour, K.; Lin, M.; Vogel, J. H.; Haynes, C.; von Lieres, E.: *Zonal rate model for axial and radial flow membrane chromatography, part I: Knowledge transfer across operating conditions and scales*, Biotechnology and Bioengineering **110,4** (2013), 1129–1141.
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Conference Proceedings

1. Kondrat, S.; Zimmermann, O.; von Lieres, E.: *Mehrskalenmodellierung von Reaktions-Diffusions-Prozessen in lebenden Systemen*, 18. Heiligenstädter Kolloquium, Technische Systeme für die Lebenswissenschaften (Heilbad Heiligenstadt, Germany, September 19–21, 2016).
2. Freier, L.; von Lieres, E.: *Kriging based iterative parameter estimation procedure for biotechnology applications with nonlinear trend functions*, MATHMOD (Vienna, Austria, February 18–20, 2015), IFAC-PapersOnLine **48,1** (2015): 574–579.
3. Püttmann, A.; Nicolai, M.; Behr, M.; von Lieres, E.: *A Finite Element Method for Spatially Resolved Simulation of Packed Bed Chromatography*, Proceedings in Applied Mathematics and Mechanics **13** (2013), 511–512 (84^{th} Annual meeting of the international association of applied mathematics and mechanics, Novi Sad, Serbia, March 18–22, 2013).
4. Ghosh, P.; von Lieres, E.: *Mechanistic and semi-empirical approaches for modeling inhomogeneous flow in membrane chromatography capsules*, pp. 512–524 in *Proceedings of the 14^{th} Aachener Membran-Kolloquium* (Aachen, Germany, November 7–8, 2012).
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6. Hannemann-Tamás, R.; Tillack, J.; Schmitz, M.; Förster, M.; Wyes, J.; Nöh, K.; von Lieres, E.; Naumann, U.; Wiechert, W.; Marquardt, W.: *First- and second-order parameter sensitivities of a metabolically and isotopically non-stationary biochemical network model*, Proceedings of the 9th International MODELICA Conference (Munich, Germany, September 3–5, 2012).
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Book Chapters / Other

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Patents

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