

Massimo Morbidelli

Curriculum Vitae

A. Contact Information:

Dipartimento di Chimica, Materiali
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B. Education:

Dottore in Ingegneria Chimica (100/100 cum laude) (Masters), 1977
Politecnico di Milano, Italy

Doctor of Philosophy, 1987
Department of Chemical Engineering,
University of Notre Dame, USA

C. Professional Experience:

CNR Fellow and Ricercatore, 1977 - 1986
Dipartimento di Chimica Fisica Applicata,
Politecnico di Milano, Italy

Guest Faculty Fellow, 1981
Department of Chemical Engineering,
University of Notre Dame, USA

NATO Fellow, 1984
Department of Chemical Engineering,
University of Notre Dame, USA

Professor, 1986 - 1991
Dinamica e Controllo dei Processi Chimici,
Dipartimento di Ingegneria Chimica e Materiali,
Universita' degli Studi di Cagliari, Italy

Director of Studies in Chemical Engineering, Universita' degli Studi di Cagliari, Italy	1986 - 1991
Direttore (Chairman), Dipartimento di Ingegneria Chimica e Materiali, Universita' degli Studi di Cagliari, Italy	1987 - 1990
Professor, Chimica Fisica Applicata, Dipartimento di Chimica, Materiali e Ingegneria Chimica Politecnico di Milano, Italy	1991 - present
Professor, Chemical Reaction Engineering and Separation Technology, Department of Chemistry and Applied Biosciences, ETH Zurich, Switzerland	1995 – 2019 Now Emeritus
Director of Studies in Chemical and Bioengineering, ETH Zurich, Switzerland	2000 - 2019
Distinguished Visiting Professor, National University of Singapore, Singapore	2000
Vorsteher (Chairman) Institute for Chemical and Bioengineering, ETH Zurich, Switzerland	1997 - 1999 2004 - 2006 2008 - 2010
Vorsteher (Chairman) Department of Chemistry and Applied Biosciences, ETH Zurich, Switzerland	2012 - 2014
Decano Dipartimento di Chimica, Materiali e Ingegneria Chimica Politecnico di Milano, Italy	2010 - present
Visiting Professor, Faculty of Computers, Engineering and Mathematics, University of Adelaide, Australia	2018
PhD Advisor, Completed more than 100 PhD students at Universita' degli Studi di Cagliari, Politecnico di Milano and ETH Zurich	1986 - present

D. Fellowships, Honors and Recognitions:

Italian National Prize Natale Toffoloni, for Research Activity in Applied Physical Chemistry	1979
Fellowship Luigi Miani, Stazione Sperimentale per i Combustibili	1980
NATO Senior Fellowship	1991
R.H. Wilhelm Award in Chemical Reaction Engineering, American Institute of Chemical Engineers, USA	2005
Seminario Gianni Astarita, Università degli Studi Federico II, Napoli	2006
The Golden Owl, Best Teacher of the Year, Department of Chemistry and Applied Biosciences, ETH Zurich, Switzerland	2007
Gerhard Damköhler-Medaille from Process-Net, DECHEMA and VDI-GVC, Germany	2014
Excellence in Process Development Research Award, American Institute of Chemical Engineers, USA	2017
Separation Science and Technology Award, American Chemical Society, USA	2018
2019 Integrated Continuous Biomanufacturing, Award, Cape Cod, USA	2019
Laurea Honoris Causa, Slovak Technical University of Bratislava, Bratislava, Slovakia	2019
Election at the Italian Academy of Sciences, Accademia dei Lincei, Rome, Italy	2019

F. Professional Activities:

Italian representative, Working Party on Chemical Reaction Engineering, European Federation of Chemical Engineering	1987 - 1997
Member, Editorial Board, Separation Science and Technology, Taylor & Francis Group, Oxford, UK	1990 - present
Member, Board of Directors, International Adsorption Society	1994 - 2004
Member, Editorial Board, Cambridge Series in Chemical Engineering, Cambridge University Press, Cambridge, UK	1996 - 2009
Member, Advisory Board, Industrial & Engineering Chemistry and Research, American Chemical Society, USA	1997 - 2001
Member, Scientific Advisory Board, Novasep, Nancy, France	1998 - 2004
Chairman, International Symposium on Preparative and Industrial Chromatography and Allied Techniques - SPICA, Zurich, Switzerland	2000 and 2008
Guest Editor, Special Issue on SPICA 2000, Separation Science and Technology, Taylor & Francis Group, Oxford, UK	2002
Member, Board of Directors AIChE Division, Catalysis and Reaction Engineering	2002
Member, Scientific Advisory Board Max Planck Institute for Dynamics and Complex Technical Systems Magdeburg, Germany	2002 - 2010
Member, Scientific Advisory Board Solexis Solvay Bollate, Italy	2003 - 2010

Member, International Advisory Board
Macromolecular Materials and Engineering,
Wiley-VCH Verlag, Germany 2003 - present

Associate Editor,
Industrial & Engineering Chemistry Research,
American Chemical Society, USA 2005 - present

Member, International Advisory Board,
Macromolecular Reaction Engineering,
Wiley-VCH Verlag, Germany 2006 - present

Member, Editorial Advisory Board,
Chemical Papers,
Springer Verlag, Germany 2006 - present

Past-President and Co-founder, ChromaCon AG (www.chromacon.ch), Continuous Chromatography Technologies for Protein Purification, Zurich, Switzerland (Acquired by YMC, Japan)	2008 - 2019
Member, Editorial Board, Reviews in Chemical Engineering, Walter de Gruyter Publishers, Germany	2010 – present
Member, Committee, Italian Research and University Evaluation Agency, ANVUR Rome, Italy	2012 - 2014
Member, Scientific Advisory Board, Joint Research Network on Advanced Materials and Systems - JONAS, BASF, Germany	2013 - present
Member, Editorial Board, Reference Module in Chemistry, Molecular Sciences and Chemical Engineering, Elsevier, Oxford, UK	2013 - 2019
Member, Editorial Board, Life Sciences Letters, IEEE Open Access Publishing	2014 - present
Member, Honorary Editorial Board, Antibody Technology Journal, Dove Medical Press	2014 - present
Member, Scientific Committee, Cardio Centro Lugano, Switzerland	2015 - present
Co-founder and President, DataHow AG, Big Data in Bioprocessing, Zurich, Switzerland	2017 - present

Massimo Morbidelli

List of Publications

Books

1. D. Pfister, L. Nicoud and M. Morbidelli, *Continuous Biopharmaceutical Processes* 2018, New York, USA: Cambridge University Press. 350.
2. M. Morbidelli, A. Gavriilidis, and A. Varma, *Optimal distribution of catalyst in pellets, reactors, and membranes* 2001, New York, USA: Cambridge University Press. 227.
3. A. Varma, M. Morbidelli, and H. Wu, *Parametric sensitivity in chemical systems* 1999, New York, USA: Cambridge Univ Press. 342.
4. A. Varma and M. Morbidelli, *Mathematical methods in chemical engineering* 1997, New York, USA: Oxford University Press. 686.
5. S. Carrà and M. Morbidelli, *Chimica fisica applicata* 1983, Milano, Italy: Hoepli.

Scientific Articles and Reviews

1. Narayanan, H., Sokolov, M., Morbidelli, M., Butté, A., *A new generation of predictive models—the added value of hybrid models for manufacturing processes of therapeutic proteins*, Biotechnology and Bioengineering, 2019
2. Wolf, M. K., Pechlaner, A., Lorenz, V., Karst, D. J., Souquet, J., Broly, H., Morbidelli, M., *A two-step procedure for the design of perfusion bioreactors*. Biochemical Engineering Journal, 2019, 107295.
3. Hajduk, J., Wolf, M., Steinhoff, R., Karst, D., Souquet, J., Broly, H., Morbidelli, M., Zenobi, R., *Monitoring of antibody glycosylation pattern based on microarray MALDI-TOF mass spectrometry*, Journal of biotechnology, 2019
4. Narayanan, H., Sokolov, M., Butté, A., Morbidelli, M., *Decision Tree–PLS (DT-PLS) algorithm for the development of process-specific local prediction models*, Biotechnology progress, 2019, e2818
5. Feidl, F., Garbellini, S., Vogg, S., Sokolov, M., Souquet, J., Broly, H., Butté, A., Morbidelli, M., *A new flow cell and chemometric protocol for implementing in-line Raman spectroscopy in chromatography*, Biotechnology progress, 2019
6. Lu, J., Caimi, S., Erfle, P., Wu, B., Cingolani, A., Luo, Y., Dietzel, A., Luo, P., Wu, H., Morbidelli, M., *Aggregation of stable colloidal dispersion under short high-shear microfluidic conditions*, Chemical Engineering Journal, 2019, 122225
7. Bielser, J. M., Chappuis, L., Xiao, Y., Souquet, J., Broly, H., & Morbidelli, M., *Perfusion cell culture for the production of conjugated recombinant fusion proteins reduces clipping and quality heterogeneity compared to batch-mode processes*, Journal of biotechnology, 2019
8. Wolf, M. K., Müller, A., Souquet, J., Broly, H., Morbidelli, M., *Process design and development of a mammalian cell perfusion culture in shake-tube and benchtop bioreactors*, Biotechnology and Bioengineering, 2019.
9. Klaue, A., Kruck, M., Binel, P., Friederichs, N., Bertola, F., Wu, H., Morbidelli, M., *Ziegler-Natta Catalyst Sonofragmentation for Controlling Size and Size Distribution of the Produced Polymer Particles*, AIChE Journal, 2019
10. Caimi, S., Colombo, C., Ferrari, R., Storti, G., Morbidelli, M. *Recovery of Mineral Oil from Underground Electrical Cables*, International journal of environmental research and public health, 2019, 16(13), 2357
11. Vogg, S., Ulmer, N., Souquet, J., Broly, H., Morbidelli, M., *Experimental Evaluation of the Impact of Intrinsic Process Parameters on the Performance of a Continuous Chromatographic Polishing Unit (MCSGP)*, Biotechnology Journal, 2019, 14(7), 1800732
12. Yang T, Cingolani A, Casalini T, Aribia A, Klaue A, Wu H, Stavrakis S, de Mello A, Morbidelli M. *Reactive Gelation Synthesis of Monodisperse Polymeric Capsules Using Droplet-Based Microfluidics*, Advanced Materials Technologies, 2019, 1900092
13. Lorenz, M., Paganini, C., Storti, G., Morbidelli, M., *Macroporous polymer-protein hybrid materials for antibody purification by combination of reactive gelation and click-chemistry*, Materials, 2019, 12(10), 1580
14. Bertrand, V., Karst, D. J., Bachmann, A., Cantalupo, K., Soos, M., Morbidelli, M., *Transcriptome and proteome analysis of steady-state in a perfusion CHO cell culture process*, 2019, 116(8), 1959-1972
15. Ulmer, N., Ristanovic, D., Morbidelli, M. *Process for continuous Fab production by digestion of IgG*, Biotechnology journal, 2019, 1800677
16. Broglia, Francesca; Rimoldi, Luca; Meroni, Daniela; De Vecchi, Sebastiano; Morbidelli, Massimo; Ardizzone, Silvia, *Guaiacol hydrodeoxygenation as a model for lignin upgrading. Role of the support surface features on Ni-based alumina-silica catalysts*, Fuel, 2019, 243, 501-508
17. Klaue, Antoine; Kruck, Matthias; Friederichs, Nic; Bertola, Francesco; Wu, Hua; Morbidelli, Massimo, *Insight into the Synthesis Process of an Industrial Ziegler-Natta Catalyst*, Ind. Eng. Chem.

- Res., 2019, 58, 886-896
18. Wolf, Moritz K. F.; Closet, Aurelie; Bzowska, Monika; Bielser, Jean-Marc; Souquet, Jonathan; Broly, Herve; Morbidelli, Massimo, *Improved Performance in Mammalian Cell Perfusion Cultures by Growth Inhibition*, Biotechnology Journal, 2019, 14, 1700722
 19. Bielser Jean-Marc; Domaradzki Jakub; Souquet Jonathan; Broly Herve; Bielser Jean-Marc; Morbidelli Massimo, *Semi-Continuous Scale-Down Models for Clone and Operating Parameter Screening in Perfusion Bioreactors*, Biotechnology Progress, 2019, 2790
 20. Ulmer Nicole; Vogg Sebastian; Muller-Spath Thomas; Morbidelli Massimo, *Purification of Human Monoclonal Antibodies and Their Fragments*, Methods in Molecular Biology, 2019, 1904, 163-188
 21. Baur, D., Angelo, J., Chollangi, S., Müller-Späth, T., Xu, X., Ghose, S., Li, Z. J., Morbidelli, M., *Model-assisted process characterization and validation for a continuous two-column protein A capture process*. Biotechnol. Bioeng., 2019, 116, 87-98
 22. Ferrari, R., Sponchioni, M., Morbidelli, M., Moscatelli, D., *Polymer nanoparticles for the intravenous delivery of anticancer drugs: The checkpoints on the road from the synthesis to clinical translation*. Nanoscale, 2018, 10(48), 22701-22719.
 23. Vogg, S., Müller-Späth, T., Morbidelli, M., *Current status and future challenges in continuous biochromatography*. Current Opinion in Chemical Engineering, 2018, 22, 138-144
 24. Baur, D., Angelo, J.M., Chollangi, S., Xu, X., Müller-Späth, T., Zhang, N., Ghose, S., Li, Z.-J., Morbidelli, M., *Model assisted comparison of Protein A resins and multi-column chromatography for capture processes*. J. Biotechnol., 2018, 285, 64-73
 25. Caimi, S., Klaue, A., Wu, H., Morbidelli, M., *Effect of SiO₂ Nanoparticles on the Performance of PVdF-HFP/Ionic Liquid Separator for Lithium-Ion Batteries*. Nanomaterials, 2018, 8, 926
 26. Wolf, M.K.F., Lorenz, V., Karts, D., Souquet, J., Broly, H., Morbidelli, M., *Development of a shake tube-based scale-down model for perfusion cultures*. Biotechnol. Bioeng., 2018, 115, 2703-2713
 27. Caimi, S., Wu, H., Morbidelli, M., *PVdF-HFP and Ionic-Liquid-Based, Freestanding Thin Separator for Lithium-Ion Batteries*. ACS Applied Energy Materials, 2018, 1, 5224-5232
 28. Beltzung, A., Newton, M. A., Nachtegaal, M., Wu, H., Storti, G., Morbidelli, M., *Distribution and stabilization of Pd catalysts in porous carbon-based supports by aggregation of pre-doped colloidal particles*. APL Materials, 6, 100704
 29. Caimi, S., Timmerer, E., Banfi, M., Storti, G., Morbidelli, M. *Core-Shell Morphology of Redispersible Powders in Polymer-Cement Waterproof Mortars*. Polymers, 2018, 10, 1122
 30. Hutter, S., Wolf, M., Gao, N. P., Lepori, D., Schweigler, T., Morbidelli, M., Gunawan, R., *Glycosylation Flux Analysis of Immunoglobulin G in Chinese Hamster Ovary Perfusion Cell Culture*., Processes, 2018, 6, 176
 31. Vogg, S., Wolf, M. K. F., Morbidelli, M., *Continuous and Integrated Expression and Purification of Recombinant Antibodies*, in *Recombinant Protein Expression in Mammalian Cells*, edited by Hacker, D. L., 2018, p. 147-178
 32. Bertrand, V., Vogg, S., Villiger, T. K., Stettler, M., Broly, H., Soos, M., Morbidelli, M., *Proteomic analysis of micro-scale bioreactors as scale-down model for a mAb producing CHO industrial fed-batch platform*. J. Biotechnol., 2018, 279, 27-36
 33. Fleckenstein, P., Rosenboom, J. G., Storti, G., Morbidelli, M., *Synthesis of Cyclic (Ethylene Furanoate) Oligomers via Cyclodepolymerization*. Macromol. React. Eng., 2018, 12, 1800018
 34. Rosenboom, J. G., Hohl, D. K., Fleckenstein, P., Storti, G., Morbidelli, M., *Bottle-grade polyethylene furanoate from ring-opening polymerisation of cyclic oligomers*. Nat. Comm., 2018, 9, 2701
 35. Guven, I., Gezici, O., Bayrakci, M., Morbidelli, M., *Calixarene-immobilized monolithic cryogels for preparative protein chromatography*. J. Chromatogr. A, 2018, 1558, 59-68
 36. Bielser, J.-M., Wolf, M., Souquet, J., Broly, H., Morbidelli, M., *Perfusion mammalian cell culture for recombinant protein manufacturing – A critical review*. Biotechnol. Adv., 2018, 36, 1328-1340
 37. Rosenboom, J. G., De Lorenzi, L., Storti, G., Morbidelli, M., *Reaction kinetics and simulations of*

- ring-opening polymerization for the synthesis of polybutylene terephthalate*. *Polymer*, 2018, 146, 120-132
38. Beltzung, A., Colombo, C., Nachtegaal, M., Wu, H., Storti, G., Morbidelli, M., *Incorporation and distribution of noble metal atoms in polyacrylonitrile colloidal particles using different polymerization strategies*. *Polymer*, 2018, 145, 41-53
 39. Casalini, T., Visscher, F., Tamaddoni, M., Friederichs, N. Bertola, F., Storti, G., Morbidelli, M., *The Effect of Residence Time Distribution on the Slurry-Phase Catalytic Ethylene Polymerization: An Experimental and Computational Study*. *Macromol. React. Eng.*, 2018, 12, 1700058
 40. Capasso Palmiero, U., Morosi, L., Bello, E., Ponzio, M., Frapolli, R., Matteo, C., Ferrari, M., Zucchetti, M., Minoli, L., De Maglie, M., Romanelli, P., Morbidelli, M., D'Incalci, M., Moscatelli, D., *Readily prepared biodegradable nanoparticles to formulate poorly water soluble drugs improving their pharmacological properties: The example of trabectedin*. *J. Control. Release*, 2018, 276, 140-149
 41. Beltzung, A., Klaue, A., Colombo, C., Wu, H., Storti, G., Morbidelli, M., *Polyacrylonitrile Nanoparticle-Derived Hierarchical Structure for CO₂ Capture*. *Energy Technol.*, 2018, 6, 718-727
 42. Sokolov, M., Morbidelli, M., Butté, A., Souquet, J., Broly, H., *Sequential multivariate cell culture modeling at multiple scales supports systematic shaping of a monoclonal antibody towards a quality target*. *Biotechnol. J.*, 2018, 13, 1700461
 43. Villiger, T. K., Neunstoeckliin, B., Karst, D. J., Lucas, E., Stettler, M., Broly, H., Morbidelli, M., Soos, M. *Experimental and CFD physical characterization of animal cell bioreactors: From micro- to production scale*. *Biochem. Eng. J.*, 2018, 131, 84-94
 44. Cingolani, A., Baur, D., Caimi, S., Storti, G., Morbidelli, M., *Preparation of perfusive chromatographic materials via shear-induced reactive gelation*. *J. Chromatogr. A*, 2018, 1538, 25-33
 45. Cingolani, A., Cuccato, D., Storti, G., Morbidelli, M., *Control of Pore Structure in Polymeric Monoliths Prepared from Colloidal Dispersions*. *Macromol. Mater. Eng.*, 2018, 303, 1700417
 46. Wu, H., Wei, D., Morbidelli, M., *The Generalised Stability Model and Its Application in Polymer Colloids*. *Adv. Polymer Sci.*, 2018, 281, 79-104
 47. Karst, D. J., Steinebach, F., Morbidelli, M., *Continuous Integrated Manufacture of Therapeutic Proteins*. *Current Opinion in Biotechnology*, 2018, 53: 76-84
 48. Fischer, E. J., Cuccato, D., Storti, G., Morbidelli, M., *Effect of the charge interactions on the composition behavior of acrylamide/acrylic acid copolymerization in aqueous medium*. *European Polymer Journal*, 2018, 98: 302-312
 49. Caimi, S., Cingolani, A., Jaquet, B., Siggel, M., Lattuada, M., Morbidelli, M., *Tracking of Fluorescently Labeled Polymer Particles Reveals Surface Effects during Shear-Controlled Aggregation*. *Langmuir*, 2017, Volume 33, 14038-14044
 50. Jin, L., Bemetz, J., Meng, X., Wu, H., Morbidelli, M., *Thermoresponsive Stability of Colloids in Butyl Acetate/Ethanol Binary Solvent Realized by Grafting Linear Acrylate Copolymers*. *Langmuir*, 2017, Volume 33, 9687-9693
 51. Wu, H., Wei, D., Morbidelli, M., *The Generalized Stability Model and its Applications in Polymer Colloids*. *Advances in Polymer Science*, 2017
 52. Lodi, G., Pellegrini, L., Aliverti, A., Rivas Torres, B., Bernardi, M., Morbidelli, M., Storti, G., *Recovery of monosaccharides from lignocellulosic hydrolysates by ion exclusion chromatography*. *Journal of Chromatography A*, 2017, Volume 1496, 25-36
 53. Ulmer, N., Pfister, D., Morbidelli, M., *Reactive separation processes for the production of PEGylated proteins*. *Current opinion in colloid and interface science*, 2017, Volume: 31, 86-91
 54. Castiglione, F., Ferro, M., Mavroudakos, E., Pelitteri, R., Bossolasco, P., Zaccheo, D., Morbidelli, M., Silani, V., Mele, A., Moscatelli, D., Cova, L., *NMR Metabolomics for Stem Cell type discrimination*. *Scientific Reports*, 2017, Volume 7, 15808
 55. Karst, D., Scibona, E., Serra, E., Bielser, J.-M., Souquet, J., Stettler, M., Broly, H., Soos, M.,

- Morbidelli, M., Villiger, T., *Modulation and modeling of monoclonal antibody N-linked glycosylation in mammalian cell perfusion reactors*. Biotechnology and Bioengineering, 2017, Volume: 114, 1978-1990
56. Karst, D., Steinhoff, R., Kopp, M., Soos, M., Zenobi, R., Morbidelli, M., *Isotope labeling to determine the dynamics of metabolic response in CHO cell perfusion bioreactors using MALDI-TOF-MS*. Biotechnology Progress, 2017, Volume: 33, 1630-1639
 57. Lodi, G., Storti, G., Pellegrini, L., Morbidelli, M., *Ion Exclusion Chromatography: Model Development and Experimental Evaluation*. Industrial & Engineering Chemistry Research, 2017, Volume: 56, 1621-1632
 58. Papathanasiou, M., Steinebach, F., Morbidelli, M., Mantalaris, A., Pistikopoulos, E., *Intelligent, model-based control towards the intensification of downstream processes*. Computers and Chemical Engineering, 2017, Volume: 105, 173-184
 59. Losfeld, M.-E., Scibona, E., Lin, C.-W., Villiger, T., Gauss, R., Morbidelli, M., Aebi, M., *Influence of protein/glycan interaction on site-specific glycan heterogeneity*. The FASEB Journal, 2017, Volume: 31, 4623-4635
 60. Steinebach, F., Ulmer, N., Decker, L., Aumann, L., Morbidelli, M., *Experimental design of a twin-column countercurrent gradient purification process*. Journal of Chromatography A, 2017, Volume: 1492, 19-26
 61. Steinebach, F., Krättli, M., Storti, G., Morbidelli, M., *Equilibrium Theory Based Design Space for the Multicolumn Countercurrent Solvent Gradient Purification Process*. Industrial & Engineering Chemistry Research, 2017, Volume: 56, 13482-13489
 62. Sokolov, M., Ritscher, J., MacKinnon, N., Souquet, J., Broly, H., Morbidelli, M., Butté, A., *Enhanced process understanding and multivariate prediction of the relationship between cell culture process and monoclonal antibody quality*. Biotechnology Progress, 2017, Volume: 33, 1368-1380
 63. Jaquet, B., Lazzari, S., Colonna, L., Colombo, G., Soos, M., Morbidelli, M., *Effects of Coalescence on Shear-Induced Gelation of Colloids*. Langmuir, 2017, Volume:33, 1180-1186
 64. Fischer, E., Cuccato, D., Storti, G., Morbidelli, M., *Effect of the charge interactions on the composition behavior of acrylamide/acrylic acid copolymerization in aqueous medium*. European Polymer Journal, 2017, Volume: 98, 302-312
 65. Steinebach, F., Ulmer, N., Wolf, M., Decker, L., Schneider, V., Wälchli, R., Karst, D., Souquet, J., Morbidelli, M., *Design and operation of a continuous integrated monoclonal antibody production process*. Biotechnology Progress, 2017, Volume: 33, 1303-1313
 66. Cingolani, A., Cuccato, D., Storti, G., Morbidelli, M., *Control of Pore Structure in Polymeric Monoliths Prepared from Colloidal Dispersions*. Macromolecular Materials and Engineering, 2017, 1700417
 67. Steinebach, F., Wälchli, R., Pfister, D., Morbidelli, M., *Adsorption Behavior of Charge Isoforms of Monoclonal Antibodies on Strong Cation Exchangers*. Biotechnology Journal, 2017, 1700123
 68. Steinebach, F., de Neuville, B.C., Morbidelli, M., *Relating Saturation Capacity to Charge Density in Strong Cation Exchangers*. J. Chromatogr. A, 2017, 1507, 95-103
 69. Karst, D. J., Steinebach, F., Soos, M. and Morbidelli, M., *Process performance and product quality in an integrated continuous antibody production process*. Biotechnol. Bioeng., 2017, **114**: 298–307.
 70. R. Ferrari, L. Talamini, M. B. Violatto, P. Giangregorio, M. Sponchioni, M. Morbidelli, M. Salmona, P. Bigini, and D. Moscatelli, *Biocompatible Polymer Nanoformulation To Improve the Release and Safety of a Drug Mimic Molecule Detectable via ICP-MS*, Molecular Pharmaceutics, 2017, **14** (1), p124-134
 71. T. Casalini, F. Visscher, E. Janssen, F. Bertola, G. Storti, M. Morbidelli, *Modeling of Polyolefin Polymerization in Semibatch Slurry Reactors: Experiments and Simulations.*, Macromol. React. Eng. 2017, **11**, 1600036.
 72. J.-G. Rosenboom, J. De Roo, G. Storti, M. Morbidelli, *Diffusion (DOSY) 1H NMR as an Alternative*

Method for Molecular Weight Determination of Poly(ethylene furanoate) (PEF) Polyesters, Macromol. Chem. Phys. 2017, **218**, 1600436.

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74. R. Khalaf, B. Coquebert de Neuville, M. Morbidelli, *Protein adsorption in polyelectrolyte brush type cation-exchangers*, Journal of Chromatography A, 2016, **1471**, p126-137
75. Pfister, D., Ulmer, N., Klaue, A., Ingold, O. and Morbidelli, M. *Modeling the Kinetics of Protein Conjugation Reactions*. Chemie Ingenieur Technik, 2016, **88**, p1598–1608.
76. Villiger, T. K., Roulet, A., Périlleux, A., Stettler, M., Broly, H., Morbidelli, M. and Soos, M., *Controlling the time evolution of mAb N-linked glycosylation, Part I: Microbioreactor experiments*, Biotechnol Progress, 2016, **32**, p1123–1134.
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78. O. Ingold, D. Pfister, M. Morbidelli, *A reactive continuous chromatographic process for protein PEGylation*, React. Chem. Eng., 2016,**1**, p218-228
79. D. Xie, X. Zhang, M. Morbidelli, and H. Wu, *Competitive Adsorption of Xanthates with Different Chain Lengths on Chalcopyrite Particles*. Industrial & Engineering Chemistry Research, 2016. **55**(5): p. 1461-1468.
80. S. Lazzari, L. Nicoud, B. Jaquet, M. Lattuada, M. Morbidelli, *Fractal-like structures in colloid science*, Advances in Colloid and Interface Science, 2016, **235**, p1-13
81. X. Meng, H. Wu, G. Storti, M. Morbidelli, *Effect of Dispersed Polymeric Nanoparticles on the Bulk Polymerization of Methyl Methacrylate*, Macromolecules, 2016, **49** (20), pp 7758–7766
82. D. Pfister, O. Ingold, M. Morbidelli, *Model-based development of an on-column PEGylation process*, React. Chem. Eng., 2016,**1**, 204-217
83. Sokolov, M., Ritscher, J., MacKinnon, N., Bielser, J.-M., Brühlmann, D., Rothenhäusler, D., Thanei, G., Soos, M., Stettler, M., Souquet, J., Broly, H., Morbidelli, M., Butté, A., *Robust factor selection in early cell culture process development for the production of a biosimilar monoclonal antibody*. Biotechnol Progress, 2016, **33**: 181–191.
84. T.K. Villiger, R.F. Steinhoff, M. Ivarsson, T. Solacroup, M. Stettler, H. Broly, J. Krismer, M. Pabst, R. Zenobi, M. Morbidelli, and M. Soos, *High-throughput profiling of nucleotides and nucleotide sugars to evaluate their impact on antibody N-glycosylation*. Journal of Biotechnology, 2016. **229**: p. 3-12.
85. R.F. Steinhoff, D.J. Karst, F. Steinebach, M.R.G. Kopp, G.W. Schmidt, A. Stettler, J. Krismer, M. Soos, M. Pabst, A. Hierlemann, M. Morbidelli, and R. Zenobi, *Microarray-based MALDI-TOF mass spectrometry enables monitoring of monoclonal antibody production in batch and perfusion cell cultures*. Methods (San Diego, Calif.), 2016. **104**: p. 33-40.
86. F. Steinebach, T. Müller-Späth, and M. Morbidelli, *Continuous counter-current chromatography for capture and polishing steps in biopharmaceutical production*. Biotechnology Journal, 2016. **21**: p. 1126-1141.
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Patents

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