

CV for Krist V. Gernaey (1970)



Degrees:

1997 PhD Ghent University (Belgium)

1993 MSc Ghent University (Belgium)

Positions:

2014-...: Centerleader Process and Systems Engineering Center (PROSYS), DTU Chemical Engineering

2013- ...: Professor in Industrial Fermentation Technology, DTU Chemical Engineering

2005-2012: Associate professor, DTU Chemical Engineering

1998-2005: Post-doctoral fellow at Lund University (Sweden) (2004-2005), DTU Chemical Engineering

(2001-2004), École Polytechnique de Montréal (Quebec, Canada) (2000-2001), Ghent University (Belgium)

(1998-1999)

Research Area:

Industrial fermentation technology, development and optimisation of fermentation, biocatalysis, pharmaceutical and biological wastewater treatment processes. Application and development of computer-aided tools, models and model validation, Process Analytical Technology (PAT), continuous production processes

Distinctions and awards:

1998-1999: Postdoc scholarship (personal grant, awarded based on individual merit), Agency for Innovation by Science and Technology, Brussels, Belgium

2000: NATO Scholarship

2000: Postdoc scholarship (personal grant, awarded based on individual merit), Quebec Ministry of Education, 'Bourses d'excellence 2000' program

Memberships of scientific committees, review, positions of trust (selected)

2005 - 2012: Member editorial board Water Science & Technology, Associate Editor

2012 - 2014: Chairman DTU PhD committee Chemistry, Biotechnology and Chemical Engineering

2013 - 2014: Editorial Advisory Board Bioprocess and Biosystems Engineering

2014 - 2015: Chairman EFCE Working Party on Quality by Design (QbD)

2015: Associate Editor Bioprocess and Biosystems Engineering

2016 - ...: Member Bio4 expert panel FWO (Belgium)

ISI journal publications (WoS, 21 August 2017): 202; Citations: 3697; H-index: 35;

Other publ.: 20 contributions to books (book chapters); about 500 contributions to conferences (posters, presentations), workshops, etc.

Books:

Gani R., Gernaey K.V., Sin G. (Eds.) (2012) Process Systems Engineering – Ullmann's Encyclopedia of Industrial Chemistry, Wiley (ISBN: 9783527306732)

Gernaey K.V., Jeppsson U., Vanrolleghem P.A., Copp J.B. (Eds-) (2014) Benchmarking of Control Strategies for Wastewater Treatment Plants. IWA Scientific and Technical Report No. 23. IWA Publishing, London, UK (ISBN: 9781843391463)

Supervision of PhDs, 2008 – present (ongoing or finished in 2008 or later):

Finished: Main supervisor for 13 PhD students at DTU, co-supervisor for 18 PhD students at DTU, 3 PhD students at Ghent University (Belgium), 2 PhD projects at Lund University (Sweden)

Ongoing: main supervisor for 12 PhD students at DTU; co-supervising 10 PhD students at DTU; co-supervising 1 PhD student at Ghent University Gent (Belgium); co-supervising 1 PhD student at the Technical University of Munchen (Germany); co-supervising 1 PhD student at University of Strathclyde (UK)

Teaching and Education activities:

Introduction to Process Control (BSc/MSc), Introduction to Matlab Programming (MSc), Biotechnology and Process Design (BEng), Measurement, Modelling, Monitoring and Control (M3C) in Biochemical Engineering (PhD), BIOPRO World Talent Campus (PhD). Has been teaching Quality by Design (MSc), Good Manufacturing Practise (GMP) (MSc), Uncertainty and Sensitivity Analysis (PhD)

Grants, 2010 – present (ongoing or finished in 2010 or later):

Selected examples: **2010**, The Danish Council for Independent Research, Technology and Production Sciences (FTP), main applicant, 'Novel leaner and green processes using integrated microfactories'; **2011**, EU (Marie Curie Initial Training Network), co-applicant, Sustainable and Integrated Urban Water System Management (SANITAS); **2012**, EU regional fund + Erhvervsstyrelsen, co-applicant, BIOPRO; **2012**, Novo Nordisk Foundation (Committee on Biotechnology-Based Synthesis and Production Research), main applicant, Exploring biochemical process performance limits through topology optimization; **2013**: Novo Nordisk Foundation, main applicant, BIOPRO World Talent Campus PhD course; **2013**: EU (Marie Curie Initial Training Network), co-applicant, European network for innovative microreactor applications in bioprocess development (EUROMBR); **2014**: DSF, Programme Commission on Health, Food and Welfare, co-applicant, 'Reuse of water in the food and bioprocessing industries (REWARD)'; **2014**: DSF, Programme Commission on Health, Food and Welfare, co-applicant, 'Keratin2Protein: Novel approach to protein recovery from unutilized slaughterhouse waste through microbial conversion'; **2014**: Innovationsfonden (formerly 'Advanced Technology Foundation), co-applicant, 'Environmentally friendly protein production (EFPro2); **2015**: Innovationsfonden, main applicant, BIOPRO2 strategic research center; **2015**: Innovationsfonden, co-applicant, INNO+ DRIP; **2016**: ERA-NET Cofund Waterworks 2014, co-applicant, 'Smart decentralised water management through a dynamic integration of technologies' (WATINTECH); **2016**: EUDP, co-applicant, 'Demonstration of 2G ethanol production in full scale'; **2016**: Innovationsfonden: Industrial PhD Leander Petersen (with Unibio); **2017**: Innovationsfonden: Industrial PhD Jonas Bisgaard (with Freesense)

Research collaboration with industry, 2008 – present:

Collaboration with Alfa Laval, Bioscavage, Carlsberg, Chr. Hansen, CPKelco, Dong ENERGY, FreeSense, H. Lundbeck, Leo Pharma, Microsoft, NNE Pharmaplan, Novozymes, Novo Nordisk, Xellia Pharmaceuticals

Selected publications

Articles published 2012-2017: 114, of which 4 as first author and 31 as senior author.

Most cited paper: Gernaey K.V. et al. (2004) Activated sludge wastewater treatment plant modelling and simulation: state of the art. *Environ. Model. Software*, 19, 763-783. (195 citations, 21/08/2017)

Examples of recently published papers:

Cervera-Padrell A.E., Skovby T., Kiil S., Gani R. and Gernaey K.V. (2012) Active pharmaceutical ingredient (API) production involving continuous processes – a Process Systems Engineering (PSE)-assisted design framework. *Eur. J. Pharm. Biopharm.*, 82, 437-456.

Flores-Alsina X., Kazadi Mbamba C., Solon K., Vrecko D., Tait S., Batstone D.J., Jeppsson U., Gernaey K.V. (2015) A plant-wide aqueous phase chemistry module describing pH variations and ion speciation/pairing in wastewater treatment process models. *Wat. Res.*, 85, 255-265.

Heintz S., Mitic A., Ringborg R.H., Krühne U., Woodley J.M., Gernaey K.V. (2016) Application of a microfluidic toolbox for the development of in-situ product removal strategies in biocatalysis. *J. Flow Chem.*, 6, 18-26.

Bolic A., Larsson H., Hugelier S., Eliasson Lantz A., Krühne U., Gernaey K.V. (2016) A flexible well-mixed milliliter-scale reactor with high oxygen transfer rate for microbial cultivations. *Chem. Eng. J.*, 303, 655-666.

Petersen L.A.H., Villadsen J., Jørgensen S.B., Gernaey K.V. (2017) Mixing and mass transfer in a pilot scale U-loop bioreactor. *Biotechnology and Bioengineering*, 114, 344-354.

Mears L., Stocks S.M., Albaek M.O., Sin G., Gernaey K.V. (2017) Application of a mechanistic model as a tool for on-line monitoring of pilot scale filamentous fungal fermentation processes – The importance of evaporation effects. *Biotechnology and Bioengineering*, 114, 589-599.

Bach C., Yang J., Larsson H., Stocks S.M., Gernaey K.V., Albaek M.O., Krühne U. (2017) Evaluation of mixing and mass transfer in a stirred pilot scale bioreactor utilizing CFD. *Chemical Engineering Science*, 171, 19-26.

Mears L., Stocks S.M., Albaek M.O., Cassells B., Sin G., Gernaey K.V. (2017) A novel model-based control strategy for aerobic filamentous fungal fed-batch fermentation processes. *Biotechnology and Bioengineering*, 114, 1459-1468.