

Alex Toftgaard Nielsen

PERSONAL INFORMATION

Date of birth: August 14, 1972

Nationality: Danish

BIOGRAPHICAL SKETCH

I am a professor at CFB with a background in chemical and metabolic engineering, bacterial physiology, and single cell biosensor systems from DTU (M.Sc. and PhD) and Stanford University (Postdoctoral fellow). I previously held positions at two different biotech companies: Exiqon in Denmark and Genencor in California, USA. My research focuses on bacterial production of biochemicals and proteins, as well as development of novel synthetic biology tools. My research is applied, with a major focus on commercialization, as exemplified by a highly efficient process for producing L-serine and cysteine, resulting in a spinout company, CysBio, recently funded with DKK 41 million. My long-term research focuses on using novel synthetic biology and computational approaches for understanding and improving production of proteins and novel biochemicals.

CURRENT AND PAST POSITIONS

- 2019-present Founder, CSO and Chairman of Board of Management of Cysbio, Denmark
- 2018-present Founder, Board member of Mycropt, Denmark
- 2011-present Professor, The NNF Center for Biosustainability, DTU, Denmark
- 2008-2011 Scientist II, Genencor, a Danisco Division, Biochemicals group, California, USA
- 2003-2008 Postdoctoral Fellow, Microbiology and Immunology, Stanford University, California, USA
- 2000-2003 Senior Research Scientist and Project Manager, Exiqon A/S, Denmark

EDUCATION

- 2000 PhD, Microbiology, Center for Microbiology, DTU, Denmark
- 1997 MSc, Chemical Engineering, Microbiology, DTU, Denmark

TEACHING AND PROFESSIONAL ACTIVITIES

Professional memberships

- 2019 Main co-founder, CSO and Chairman of Board of Management, Cysbio, Denmark, a company commercializing technologies developed at CFB.
- 2018 Co-founder and member of board of Mycropt, a company commercializing technologies developed at CFB
- 2015-present Member of the Scientific Advisory Board of the BBSRC/EPSRC Synthetic Biology Research Centre in Nottingham, UK.

- 2019-present Scientific Advisory Board of the H2020 project GasFermTEC, Estonian Center for Biosustainability
- 2015 Section editor for Current Opinion of Biotechnology

Mentorship

Graduated six PhD students, currently supervising three PhD students and six postdoctoral fellows. Supervised four MSc students and three BSc students.

Teaching

- 2016-present: Genome Editing course at CFB, DTU.
- 2016-present: Bioengineering and Critical Thinking, DTU
- 2011-present: Frequent guest lecturer at several DTU courses.

PRESTIGIOUS RESEARCH GRANTS AND PATENTS

Patents and patent applications

Inventor of 23 patents/applications, 13 of which have been filed at CFB, 8 patent applications licenced to industry, including for example:

2016 Li S, Jendresen CB, Petersen LE, Landberg JM, Falkenberg KB, Mundhada H, Nielsen AT. Methods for decoupling cell growth from production of biochemicals and recombinant polypeptides, WO2018/02001.

2015 Mundhada H, Nielsen AT. Method for the production of L-serine using genetically engineered microorganisms deficient in serine degradation pathways, WO2016/120326.

2014 Jendresen CB, Nielsen AT. Biological processes for the production of aryl sulfates, WO2016/026976

2014 Zutz A, Lennen R, Nielsen AT. A Two-cassette reporter system for assessing target gene translation and target gene product inclusion body formation, WO2016/062819

2014 Jendresen CB, Stahlhut S, Siedler S, Nielsen AT. Processes for the production of hydroxycinnamic acids using polypeptides having tyrosine ammonia lyase activity, WO2016/008886

Larger research grants (only funding directly to ATN is listed)

- 2019-2021 EU BIOTEC-03-2018, ShikiFactory100, DKK 2.8 million, Co-PI
- 2019-2021 EU Ørsted application, 2019-2021 – DKK 1.8 million, PI
- 2019-2022 Industrial postdoc, 1.2 million DKK, shared between Cysbio and Morten Nørholm, PI
- 2019-2021 DTU, Fermentation Based Manufacturing PhD program, DKK 2.5 million, PI
- 2018-2018 NNF BioInnovation Institute, Business Accelerator program: DKK 250.000, PI.

2017-2020	Novo Nordisk Foundation, Research Grant, Decouple, DKK 2.7 million, PI
2016-2019	EU, H2020-LCE-2016-ERA, Ambition, DKK 2.2 million, Co-PI
2015-2018	ERA-IB, EU, DKK 4.1 million, Co-PI
2015-2016	Proof of Concept grant, Technical University of Denmark, DKK 500.000, PI
2015-2018	Novo Nordisk Foundation postdoc grant, DKK 2.4 million, Co-PI
2014-2017	Innovation Foundation, Erhvervsphostdoc, DKK 1.6 million, PI
2012-2015	Novo Nordisk Foundation, Research grant, DKK 2.2 million, PI
2013-2016	Marie Curie ITN grant, DKK 8.2 million, Co-PI
2007	Stanford University Bio-X Senior Fellowship, young group leader, USD 700.000, fellowship declined, PI
2012-2014	Danish Research Council – Grant for Young Talented Scientists, DKK 1.2 million for postdoctoral research at Stanford University.

PUBLICATIONS

H-index: 26, i10 index: 41, peer reviewed papers received 5148 citations (Google Scholar, October 2019)

Top five publications

1. Jendresen CB, **Nielsen AT**. Production of zosteric acid and other sulfated phenolic biochemicals in microbial cell factories. *Nature Communications*, volume 10, Article number: 4071 (2019)
2. Jensen TØ, Tellgren-Roth C, Redl S, Maury J, Jacobsen SAB, Pedersen LE, **Nielsen AT**. Genome-wide systematic identification of methyltransferase recognition and modification patterns. *Nature Communications*, volume 10, Article number: 3311 (2019)
3. Bosma EF, Forster J, **Nielsen AT**. Lactobacilli and pediococci as versatile cell factories—Evaluation of strain properties and genetic tools. *Biotechnology Advances*, 2017, 35(4):419–442.
4. Mundhada H, Seoane JM, Schneider K, Koza A, Christensen HB, Klein T, Phaneuf PV, Herrgård M, Feist AM, **Nielsen AT**. Increased production of L-serine in *Escherichia coli* through Adaptive Laboratory Evolution. *Metabolic Engineering*, 2017, 39:141–150.
5. Bonde MT, Margit Pedersen M, Klausen MS, Jensen SI, Wulff T, Harrison S, **Nielsen AT**, Herrgård MJ, Sommer MOA. Predictable tuning of protein expression in bacteria. *Nature Methods*, 2016, 13(3):233–236.