

Marija Cvijovic

1 PERSONAL INFORMATION

1.1 Name Marija Cvijovic

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1.3 Current position

Since 2021 Full Professor in Mathematical Biology

1.5 Previous positions

2017-2021 Universitetslektor (Associate Professor/Senior Lecturer) in Mathematical Biology
2015- June 2017 Bitr. universitetslektor (Associate lecturer) in Mathematical Biology
Maj 2011-Dec 2014 Forskarassistent (Assistant Professor), Dept. of Mathematical Sciences, University of Gothenburg
2011(jan-april) Post-doctoral Fellow, The Sahlgrenska Academy, University of Gothenburg (Joakim Larsson Lab, antibiotic resistance)
2009-2010 Post-doctoral Fellow, Dept. of Chemical and Biological Engineering, Chalmers (Total 2yrs, Jens Nielsen Lab, topic: metabolic engineering)

1.6 Career breaks

Parental leave: Total 20 months: June 2011-March 2012; March 2014-December 2014

2 EDUCATION

2.1 University degrees

2009 PhD in Mathematics Max Planck Institute for Molecular Genetics Berlin, Germany
(I was a Marie Curie PhD Fellow; Supervisor Prof. Edda Klipp, PhD thesis: Modeling ageing in yeast)
2005 M.Sc. Bioinformatics, Chalmers University of Technology, Sweden
2003 B.Sc. Mathematics, University of Belgrade, Belgrade, Serbia

2.2 Docent/habilitation

2014 Docent in Mathematical Biology, Dept. of Mathematical Sciences, University of Gothenburg

3 SCIENTIFIC MERITS

3.1 Grants

As a main applicant, I hold grants totaling 23.6 million SEK (~2.3 million euros))

3.1.1 Grants from national and international research councils

Main applicant:

Swedish Research Council (VR) Starting Grant (3.4 million SEK) 2018-2022

Co-applicant:

Swedish Research Council (VR) Project grant 2017-2021
(3 million SEK, PI Stefan Hohmann, Biology and Biological Engineering, Chalmers)

3.1.2 Grants from the EU, foundations and authorities as well as other research funds

Stiftelsen för Strategisk Forskning (SSF) Sabbatical Programme 2020-2021
(1.2 million SEK)

Stiftelsen för Strategisk Forskning (SSF) Framtidens Forsknings Ledare (FFL 6) 2017-2022

(12 million SEK) (competitive call, **success rate: 8%**)

Hasselblad Foundation 2015-2017
(1 million SEK; Universities nominate candidates to the Foundation, 2 awards are given per year)

Stiftelsen för Strategisk Forskning (SSF) Career Development Grant 2014-2019
(6 million SEK) (competitive call, **success rate: 8%**)

Co-applicant:

Chalmers Life Science Engineering Area of Advance Seed Grant 2018-2019
(500kSEK, PI Alastair Ross, Biology and Biological Engineering, Chalmers)

Other grants (as a main applicant) (total 500kSEK~50k euros)

VINNOVA (2016); Lars Hierta Foundation (2013); Knut and Alice Wallenberg Foundation Travel grant (2009, 2010, 2012); FEBS Youth Travel Fund Grant (2010); Yeast Systems Biology Network Fellow exchange visit scholarship to Bordeaux, France (2007, 2008); Cold Spring Harbour Laboratory (2007); DAAD scholarship – German Academic Exchange Service, Virginia Bioinformatics Institute, USA (2006);

3.2 Academic national and international assignments

3.2.1 Assignments for research funders

2019 External Expert Evaluator NOW Research Foundation Vici scheme, Netherlands
2019 External Expert Evaluator MedTech applications, Sweden
2017, 2018 External Expert Evaluator FWO Research Foundation – Flanders, Belgium
2013 External reviewer Human Brain Project Competitive Call

3.2.2 Member of academies and corresponding organizations

3.2.3 Editorial assignments

2020 Editorial Board Member, Topic Editor, *Cells*
2020 Guest Editor *Experimental Gerontology*, section Mathematical Modelling of Cellular Ageing
Since 2019 Editorial Board member IOP SciNotes
Since 2019 Editorial Board member *Frontiers in Genetics*, section *Bioinformatics and Comp. Biology*
2017 co-Section Editor Future of systems biology within *Current Opinion in Systems Biology*
Since 2017 Editorial Board member *MicrobialCell*

3.2.4 Assignment as opponent and expert

PhD examinations

2021 Ashouri Arghavan, Institute of Biomedicine, Sahlgrenska Academy (committee member)
2020 Christoph Börlin, Chalmers University of Technology, Sweden (committee member)
2020 Qing Shen, Karolinska Institutet, Sweden (committee member)
2019 Simone Spolaor, University of Milano-Bicocca, Italy (opponent)
2019 Daniel Morgan, Royal Institute of Technology, Sweden (committee member)
2018 Martin Mojica Banavedes, University of Gothenburg, Sweden (Lic degree opponent)
2017 Rikard Johanson, Linköping University, Sweden (committee member)
2017 Annikka Polster, Sahlgrenska University Hospital, Sweden (Lic degree opponent)
2017 Pouyan Nouran, Chalmers University of Technology, Sweden (committee member)
2016 Lucas Sinclair, Uppsala University, Sweden (committee member)
2016 Amir Feizi, Chalmers, Chalmers University of Technology, Sweden (committee member)
2015 Sebastian Ibstedt, University of Gothenburg, Sweden (committee member)

Expert evaluator for promotions

2018 External Evaluator for the promotion to Associate Professor, Linköping University

- 2014, 2016 External evaluator for tenure School of Medicine, University of Connecticut, USA
2014 External evaluator for tenure School of Life Sciences, Tsinghua University, China

3.3 International conferences

- 2021 Advanced Lecture Course on Computational Systems Biology, France (**Plenary lecture**)
2020 Quantitative modelling of cell metabolism, Copenhagen, Denmark (**invited**)-moved to 2021
Systems Biology of Ageing, Leuven, Belgium (**Keynote**)
Bioscience seminar, The Wenner-Gren Institute (**invited**)
KUL2
2019 Molecular interactions symposium, Stockholm (**invited**)
Biostatistics seminar, Uppsala University (**invited**)
2018 Bengt Ihre Symposium, Stockholm (**invited**)
BC2 Systems and Computational Biology, Basel, Swiss (**invited**)
Systems Medicine Symposium, Stockholm (**invited**)
Biological Aging from the Perspective of Physics, Information Science and Life Sciences,
Bremen, Germany (**invited**)
2017 12th International Meeting on Yeast Apoptosis, Bari, Italy
Neurogut Symposium, The Sahlgrenska Academy, Göteborg (**invited**)
2016 17th International Conference on Systems Biology, Barcelona
Visalys Workshop on Systems Biology 'From data to models, Lyon, France (**invited**)
2015 ERASysAPP Workshop "Networking of Research Centres", Luxembourg (**invited**)
10th CFGBC Symposium, Ljubljana, Slovenia (**invited**)
2014: Systems Biology and Systems Medicine in Gothenburg, Sweden and Europe
2013 Sweden – South Africa Symposium, Stellenbosch, South Africa (**invited**)
2012 13th International Conference on Systems Biology, Toronto, Canada
Nordic Yeast Research Community Symposium, Göteborg, Sweden (**invited**)

4 PEDAGOGICAL MERITES

Teaching experience

I have more than 10 years of teaching experience. I am highly specialized in teaching mathematics (mathematical modelling) to students with experimental background: *5 PhD level courses (both national and international, 5 Master level courses, 1 undergraduate level course)*

4.1 Pedagogical education

Transcript of record attached, Appendix E

- 2015 HPE103 Applied Analysis (5hp)
2013 HPE201 Supervision in postgraduate programmes (5hp)
2013 HPE102 Teaching and learning in higher education 2 (5hp)
2012 HPE101 Teaching and learning in higher education 1 (5hp)

4.2 Teaching at undergraduate and graduate level

4.2.1 Undergraduate level

Chalmers University of Technology

Linear algebra (TMV141, now TMV143), Spring 2015, 2016, 2017, 2018, 2019, 2020
Examiner and main lecturer, total of 50 hours (lectures 50 hours)

4.2.2 Master level

University of Gothenburg

Experimental systems biology (BIO448), Spring 2014, 2015, 2016, 2017, 2018, 2019, 2020

Main lecturer, total 20 hours (lectures 12 hours + 8 hours project work); developed the theoretical track of the course and designed the project

Functional genomics and systems biology (BIO406), Fall 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020

Main lecturer, total of 20 hours (lectures 20 hours); developed the theoretical track of the course

Chalmers University of Technology

Synthetic biology (KBT225), Spring 2014, 2015, 2016, 2017, 2018, 2019, 2020

Guest lecturer, total of 2 hours (lectures 2 hours)

Large Scale Genomics, Techniques and Analysis (MVE130), Spring 2011

Computer labs, total of 15 hours (computer lab 15 hours)

Data acquisitions and Handling in Systems Biology (KMG060), Fall 2009, 2010

Lecturer, total of 8 hours (lectures 4 hours + computer lab 4 hours)

4.2.3 PhD level

University of Gothenburg

Statistics for genome sciences, Fall 2013, 2014, 2015

In 2013: Demonstrator, total of 15 hours (computer labs 15 hours)

In 2014, 2015: Examiner, Lecturer and demonstrator, total 30 hours (lectures 15 hours, computer labs 15 hours); Course development

Industrial perspectives on systems biology and bioinformatics, Spring 2013, 2017

Examiner and lecturer, total 10hours (lectures 10 hours); Developed the course

Chalmers University of Technology

1st International Course on Systems Biology of Metabolism, Spring 2010

Lecturer and demonstrator, total of 12 hours (lectures 8 hours + computer labs 4 hours)

Metabolic Engineering and Systems Biology, Fall 2008

Lecturer, total of 4 hours (lectures 4 hours)

International courses/summer schools (PhD level)

University of Gothenburg

8th FEBS International PhD Course in Yeast Systems Biology, Spring 2017

Lecturer, Full time for 11 days, total 60 hours (lectures 30 hours+ project work 30 hours);

Course co-organizer, Developed introductory lectures for students with experimental background

7th FEBS International PhD Course in Yeast Systems Biology, Spring 2015

Lecturer, total of 18 hours (lectures 12 hours+ project work 6 hours);

Course co-organizer, Developed introductory lectures for students with experimental background

6th FEBS International PhD Course in Yeast Systems Biology, Spring 2013

Lecturer, total 12 hours (lectures 6 hours+ project work 6 hours)

5th FEBS International PhD Course in Yeast Systems Biology, Spring 2011

Lecturer, total 8 hours (lectures 4 hours)

4th FEBS International PhD Course in Yeast Systems Biology, Spring 2009

Lecturer, total 2 hours (lectures 2 hours)

University of Ljubljana, Ljubljana, Slovenia

PhD Summer School: Hands-on tutorial Systems Biology/Medicine, Summer 2015

Lecturer, total 8 hours (lectures 8 hours)

NTNU, Trondheim, Norway

PhD course Introduction to Systems Biology, Fall 2008

Lecturer, total 6 hours (lectures 6 hours)

Teaching summary

Total undergraduate + master level: Lectures: 552h, Computer Lab: 23h, Project work: 48h

Total PhD level: Lectures: 120h, Computer Lab: 42h, Project work: 49h

Grand Total: 834 hours (actual 'real' hours taught, without course planning, grading...)

4.4 Supervision

4.4.1 Supervision of project, bachelor and master students

I have supervised 42 students, out of which 20 are perusing/completed their PhD studies

6 Project students (15 hp)

20 Bachelor thesis students (15hp)

7 Master thesis students (60hp, one year)

8 Master thesis students (30hp, one year)

1 Research assistant (for 2 years)

4.4.2 Licentiate and PhD students

Current:

Main supervisor of 6 PhD students:

Barbara Schnitzer (2017-2022)

Linnea Österberg (2017-2021)

Patrick Reith (2018-2022)

Svenja Bram (2019-2023)

Sebastian Persson (2020-2025)

Julia Larsson (2019-2023, collaboration with Fraunhofer – Chalmers Research Centre)

Co-supervisor of 2 PhD students:

Jacob Leander (2016-2021, collaboration with AstraZeneca and Fraunhofer – Chalmers Research Centre)

Hanna Alalam (2017-2021 with Per Sunnerhagen, GU)

Graduated:

PhD students

Main supervisor:

Johannes Borgqvist, graduated 2020 (from January 2021 Wenner-Gren Fellow, postdoc at Mathematical Institute, Oxford University, UK)

Co-supervisor:

Mariana Pereira graduated 2017, co-supervised with Erik Kristiansson (current position post-doctoral fellow at The Institute of Cancer Research, London, UK)

Sviatlana Shashkova graduated 2016, co-supervised with Stefan Hohmann, FP7 project ISOLATE (current position Newton Fellow postdoc at York University, UK)

Niek Welkenhuysen graduated 2016, co-supervised with Stefan Hohmann, FP7 project ISOLATE (current position postdoc in my group)

Frederik Boulund graduated 2015, co-supervised with Erik Kristiansson (current position Head of Bioinformatics at Karolinska, previous position post-doctoral fellow at Karolinska Institute, Sweden)

Licentiate degree

(Licentiate's degree, at Swedish Universities is recognised as a pre-doctoral degree and is equal to completion of the coursework required for a doctorate and a dissertation which is formally equivalent to half of a doctoral dissertation)

Main supervisor

Barbara Schnitzer, presented in 2020

Linnea Österberg, presented in 2020

Tobias Abenius, presented in 2019 (final degree, current position Data scientist at B3 Consulting Group)

Johannes Borgqvist, presented in 2017

Co-supervisor

Hanna Alalam, presented in 2019

Felix Held, presented in 2018

4.4.3 Postdocs

Current:

Niek Welkenhuysen (since 2017)

Johannes Borgqvist (2020)

Alumni:

Annikka Polster 2018/19 (current position Marie Sklodowska Curie Scientia Fellow in Systems/Network Medicine, Nordic Center of Molecular Medicine, University of Oslo, Norway)

Qasim Ali 2017/18 (current position researcher at North Carolina State University, USA)

4.5 Development of teaching material and methods

Course development

Completely developed following courses:

Industrial perspectives on systems biology and bioinformatics (PhD course)

Experimental systems biology (BIO448) (theoretical track) (master level course)

Functional genomics and systems biology (BIO406) (theoretical track) (master level course)

For these three courses, I have developed a complete teaching material, introduced project work and implemented teaching methodology based on peer and problem-based learning methods. Main part of the PhD course is a utilization of students own research and recognizing innovation potential. Throughout the course, students with different expertise work in small teams (4 students/team) and are developing a commercial project based on their research. As a result of the course, one team competed at the Venture Cup and was one of the 20 finalists.

For the two developed master courses, the essential part is the project work with the goal to mimic the flow of typical research project encouraging interaction between students. Students are presenting project progress at three stages during the course and should submit a final project report (mini manuscript), prepare an oral presentation and present a poster. Ability to work in a group and effectively communicate scientific topics is crucial and my vision and belief is that the students should learn those skills as early as possible.

Introduced new teaching methodology

Linear algebra TMV141/TMV143 (combination of peer and problem based learning)

I have implemented several learning activities, relying on problem-driven learning helping students to develop problem-solving skills and at the same time fosters curiosity, motivation and desire to deeper understand the given topic, resulting in long-term knowledge retention.

Pedagogical initiatives on international level

I have gathered and led a group of top 25 systems biologist in Europe to design a core curriculum of master level program in systems biology. I have (co-)organized two Workshops on Education in Systems Biology: first was held in Heidelberg, Germany in November 2014 (I was co-organizer) and the second one in Göteborg in March 2015 (I was organizer).

A result of these two Workshops is a guidance for setting up Systems Biology master program as well as synchronization of existing programs across Europe Strategies for structuring interdisciplinary education in Systems Biology – A European perspective, *npj Systems Biology and Applications* (2016) 2, 16011.

4.6 Pedagogical prizes

2019 Chalmers Pedagogical Prize

Motivation for the prize:

"Marija Cvijovic is awarded the prize for her further development of the course "Linear algebra" with the introduction of problem-based learning and for her engagement in disseminated her experience in mathematics education internationally. Marija has listened to the students when they reflected on their learning and then adapted the course according to students' needs. Her work has resulted in the students having an excellent knowledge foundation for future courses and at the same time, they have improved communication skills and increased their self-esteem. Marija has also shown academic leadership by sharing her experiences with other teachers."

4.6 Outreach activities and popular science presentations

Having my research in the area of healthy ageing, dissemination within general public is of direct relevance to the everyday experiences of the society. I am actively involved in outreach programs and establishing platforms for enhancing public awareness of the role of mathematics in biology and medicine. I am a regular guest at the Science Festival and local radio stations where I talk about importance of mathematics and its application in everyday life. I am also participating at outreach programs for primary and high school students to promote, cultivate an interest and appreciation for mathematics and communicate how science can serve the society.

2020 [Short movie about Pi-day](#), University of Gothenburg

2019 *P4 Science radio* (Vetenskapsradion) [Interview about my research](#)

Science festival (Vetenskapsfestivalen) Life as a mathematician

Mathematics around us, lecture for primary school students at Toltorpsskolan

Fönster mot naturvetenskap: Outreach program for high-school students

2018 *GU Journalen* (cover page and article about our research)

Fönster mot naturvetenskap: Outreach program for high-school students

Open Day at the Department of Mathematical Sciences

2017 Movie about my research: [They understand ageing using mathematics](#)

P1 radio station: How mathematics predicted the winner of Polar Prize Music Award

2016 Fika med forskare, *Folkuniversitetet*, Uddevalla

Åldrande och matematik, *Senior universitetet*, Stockholm

Fika med forskare, *Folkuniversitetet*, Sotenäs

P3 and P4 extra Göteborg radio stations: Mathematics and Olympic games

P3 Göteborg radio station: Mathematics and Polar Prize Music Award

P4 Göteborg radio station: Pi day

P4 Göteborg radio station: Mathematics of Ageing

2015 *Naturvetardagen*, University of Gothenburg

Framtidens Forskning: Matematiska modeller ger kunskap om åldrande

Vetenskapfestivalen (Science Festival): Populationer på liv och död;

2014 *Utbildnings magasinet*: Sluta aldrig fråga (cover page and article about our research)

2013 Quest for the Fountain of Youth or why Gilgamesh should have studied math;

5 OTHER

5.1.1 Member of decision-making and advisory bodies within higher education institutions

- Since 2018 Member of the Research Advisory Board at the Dept. of Mathematical Science
2016 Member of the Focus Group for Research Evaluation at the University of Gothenburg
Since 2016 Director of the Graduates Studies in Applied Mathematics and Statistics, Department of Mathematical Sciences, University of Gothenburg

5.1.2 Other professional administrative tasks

National organizations

- 2013-2015 CEO of the Gothenburg Centre for Systems Biology (GCSB)
Since 2011 Steering Board Member Gothenburg Bioinformatics Network

International organizations

- 2017-2019 Member of the Management Team Infrastructure for Systems Biology Europe
Since 2014 The International Society for Systems Biology – Foundation Chair
2013-2015 Swedish representative at FP7 Infrastructure for Systems Biology Europe (ISBE)

5.2 Other

Leadership training

- 2017-2020 Swedish Foundation for Strategic Research – program for Future Research Leaders
2018 Research Leader Initiative, University of Gothenburg
2015-2017 Swedish Foundation for Strategic Research: Leadership program for Promising Young Researchers
2013 Leadership program for Assistant Professors, Chalmers University of Technology

In 2016 I have been selected as one of ten promising young research leaders in Sweden to attend prestigious Science and Technology in Society (STS) Forum, Kyoto, Japan. This is by invitation only event where politicians, Nobel laureates, and researchers from around the world discuss and explore the opportunities arising from science and technology, and how it can help to solve the problems facing humankind. In 2019 I have received a special invitation by the organizer to attend the Forum, to attend the 2020 meeting, that, due to the given circumstances, be held virtually this year.

Organization of international scientific meetings (co-organizer)

- 2019 29th International Yeast meeting (450 participants)
2015 7th International Practical Course in Systems Biology, Göteborg
Workshop: Systems Biology Training and Education, Göteborg
2014 Workshop: Systems Biology Training and Education, Heidelberg, Germany
Workshop: Systems Biology Training and Education, Göteborg
2013 Current Challenges in Systems Biology Workshop, Göteborg
6th International course on yeast Systems Biology, Göteborg
2011 FutureSysBio Workshop on Defining Modeling Strategies, Göteborg
2010 10th Swedish Bioinformatics Workshop, Göteborg
2010 FEBS International Course on Systems Biology of Metabolism
2010 35th FEBS congress, Göteborg (500 participants)