Curriculum vitae – Simen Rød Sandve

My research has focused on understanding how genomes evolve and how genomic variation, especially novel variation generated by whole genome duplications, is linked to adaptation. During my PhD I worked on evolution of genetic mechanisms involved in freezing tolerance in grasses. Since then I have been involved in two large international genome sequencing consortiums. First as a Post doc in a Norwegian-funded project within the International Wheat Genome Sequencing Consortium (IWGSC), and subsequently as a research scientist in the group of Prof. Lien (NMBU) who was co-leading the International Consortium to Sequence the Atlantic salmon Genome (ICSASG). My part in these two international collaborative projects were related to analyses of genome evolution, and has resulted in ground breaking new hypotheses and scientific advances related to how wheat evolved, how hybrid genomes subdivide molecular roles among themselves, and how whole genome duplication in vertebrates drive evolutionary innovation. Participation in these genome projects have provided valuable experience in working in large collaborative consortiums and initiated several long-term collaborations with strong international research groups. In 2014 I was awarded a 10M NOK research grant for talented young researchers in the Norwegian Research Council Aquaculture program, and has recently become associate professor in genomics/bioinformatics in 2017.

PERSONAL INFORMATION:

Family name, First name: Sandve, Simen Rød
Date of birth: *03.10.1979*
Sex: Male
Nationality: Norwegian

EDUCATION:

- ***2010*:** PhD, Thesis: Genetics of Pooideae freezing tolerance – an evolutionary perspective**,** Supervisor: Prof. O.A.Rognli, Norwegian University of Life Sciences (NMBU). Approved *22.10.2010.*
- ***2005*:** MSc in Ecology, UMB
- ***2003:*** *Bachelor in Nature Management,* UMB

CURRENT AND PREVIOUS POSITIONS:

- 2017- Associate professor in genomics/bioinformatics IHA/NMBU
- *2014-2017* Research Scientist, Department of Animal and Aquacultural Sciences, NMBU
- *2011- 2014* Post Doctor Department of Plant and Environmental Sciences, NMBU.
- 2010 - 2011 Research Scientist, Department of Plant and Environmental Sciences, NMBU.

FELLOWSHIPS AND AWARDS:

- 2015 *NMBU research talent scholarship (780K NOK)*
- *2012* Fulbright Research Fellowship
- *2012* Centennial Chair travel fellowship from UMN and NMBU

TEACHING ACTIVITIES

Lecturer:

- *BIO120 - Introductory Genetics (Bachelor level), NMBU*
- *BIN210 – Introductory Bioinformatics (guest lecturer, bachelor level), NMBU*
- *BIO223 – Molecular Ecology and Evolution (Bachelor level), NMBU*
- *BIO321/421 – Population Genetics and Molecular Evolution (Master level), NMBU*

SUPERVISION OF PhD-STUDENTS:

PhDs graduated:

- **2012-2016 Co-supervisor:** NMBU, M. Schubert, Project: Why do some grasses succeed in the cold north? A systems biology perspective.

PhDs ongoing:

- **2017- Principal supervisor:** NMBU, ***To be appointed.*** *Project: The role of epigenetics in evolution of gene regulation in Atlantic salmon*
- **2015- Principal supervisor:** NMBU, T. Harvey, Project: Integrating genomics and system biology to improve the capacity for synthesis, transport, and filet deposition of EPA/DHA in salmon.
- **2017- Co supervisor:** NMBU, M. M. Holen, Project: From genome to function; Characterization of chitinase function in Atlantic salmon.
- **2015- Co-supervisor:** NMBU, Gareth Gillard, Project: Integrating genomics and system biology to improve the capacity for synthesis, transport, and filet deposition of EPA/DHA in salmon.
- **2015- Co-supervisor:** NMBU, T. D. Mulugeta, Project: ELIXIR Norway.
- **2013- Co-supervisor:** NMBU, L. Grønvold, Project: Why do some grasses succeed in the cold north? A systems biology perspective.

MOBILITY (*more 3 months*)

- *2012.* Department of Plant Biology, Microbial and Plant Genomics Institute, University of Minnesota, USA

INSTITUTIONAL RESPONSIBILITIES:

- 2015-2017 Board member for NMBU research award for young scientists
- 2008 Board member for UMB award for excellence in research
- 2006-2008: Member in Scientific Board at Department of Plant and Environmental Sciences, UMB.

ORGANIZATION OF SCIENTIFIC MEETINGS:

- 2015-2017 Organizing the 53rd Norwegian Biochemical Society contact meeting (300 participants)
- 2012 Organization committee for National Plant Biology Conference (PlantBio 2012)

COMMISSIONS OF TRUST:

e.g. reviewer for BMC Genomics, Planta, Genome Biology and Evolution, Bioinformatics, New Phytologist, Journal of Biogeography, Molecular Phylogenetics and Evolution.

RESEARCH GRANTS:

Project leader:

- **2015-2018**: Integrating genomics and system biology to improve the capacity for synthesis, transport, and filet deposition of EPA/DHA in salmon (Norwegian Research Council, 10,000,000 NOK, 2015-2018)

Co-applicant:

- **2015-2019**: Towards the Digital Salmon: From a reactive to a pre-emptive research strategy in aquaculture (Norwegian Research Council, 38,000,000 NOK)
- **2014-2017:** Linking the evolution of flowering time in long days with a major niche transition in the grass subfamily Pooideae (Norwegian Research Council, 7,000,000 NOK)
- **2012–2015:** Why do some grasses succeed in the cold north? A systems biology perspective. (NMBU 'Tverrforsk' grant, 300,000 NOK)

MAJOR COLLABORATIONS:

- Daniel Macqueen, Topic: Genome evolution in salmonids, University of Aberdeen, UK
- David Hazlerigg, Topic: Evolution of anadromy in salmonids, University of Tromsø, Norway
- Torgeir R. Hvidsten, Topic: Evolution of gene regulation, NMBU, Norway.
- Michael Leaver, Topic: Omega-3 metabolism in Atlantic salmon, University of Stirling, UK
- Rori Rohlfs, Topic: Statistical methods to detect adaptation on gene regulation, SFU, USA
- Manuel Irimia, Topic: Alternative splice regulation. CGR, Barcelona, Spain.

EARLY ACHIEVEMENTS TRACK-RECORD

Career and publication highlights:

I have published 24 peer reviewed articles. 14 of these were published during my PhD or Post Doc, of which I was the first author and/or lead corresponding author on 11 (5 first, 6 corresponding). Three of these 14 papers were published in Science and an outcome of my involvement in the International Bread Wheat Genome Sequencing Consortium (IWGSC), including co-first and corresponding author on the evolutionary history of the polyploid hybrid wheats and third author on the genetic control of grain maturation (3rd author).

In 2014 I moved started as a research scientist in the group of Prof Lien and moved from plants research to fish (salmonids). During my first year in Liens group I have lead, coordinated, and conduct analyses of genome evolution of the duplicated salmon genome under the umbrella of the International Consortium to Sequence the Atlantic Salmon Genome. This work was published as a Nature article in 2016, where I was third author. The two first and two last authors on this article was the four senior group leaders in the salmon genome sequencing project. The work on salmon has been followed up by a 2017 article in Genome Biology (second last author) taking advantage of the salmonids and their whole genome duplication as a model system to understand basic processes in genome evolution. I also recently got accepted a Nature Genetics paper (first author and shared corresponding) where we show that two independent vertebrate whole genome duplication events resulted in similar genome wide trends in regulatory evolution of duplicated genes. Our finding opposes previous hypotheses on the evolutionary fates of gene duplicates from whole genome duplications, demonstrating that my research is making an impact in this high-profile research field.

My independence and talent for research leadership is clearly reflected in my publication and research grant track record. I have 10 publications as first/corresponding author and 10 publications without my PhD or Post Doc supervisors as co-authors. Moreover, the co-author lists on my independent (after my PhD/Post Doc) corresponding-author publications reveal strong skills in building independent research collaborations with leading international research groups within their fields. This includes collaborations on plant genomics (the Mayer and Mockler labs in Germany and USA), on evolution of freezing tolerance (the Preston and Stockinger labs in USA), on bioinformatics (the The Genome Analyses Centre, UK), and now recently on genome evolution (Macqueen-lab, UK and Rohlf-lab in USA).

In 2014, I received a talented young researcher grant (TOPPFORSKER) to understand Atlantic salmon lipid metabolism using omics approaches from the Aquaculture program in the Norwegian Research Council. This project is currently employing 2 researchers and has 3 PhDs associated with the project. I am the principal supervisor for one of these PhD-students funded through the NMBU strategic program, and was recently awarded a new department PhD position (not hired yet). In 2015 I was selected to be part of the NMBU 'talent program', to support the development of early career researchers. I have recently taken an active role in the International Consortium for Functional Annotation of All salmonid Genomes where I co-lead a pilot project that aims to establish common wet-lab and bioinformatics protocols to carry out functional genomics assays (e.g. genome wide characterization of chromatin conformation and histone tail post translational modifications).

In 2017 very recently became associate professor in Genomics/Bioinformatics at NMBU, and I am now in the early phase of establishing my own group within the field of genome evolution and genome biology.

PEER REVIEW PUBLICATIONS:

I have published **24 peer reviewed publications** with a total of **1028 citations** (May. 2017). **First/shared-first** and/or **corresponding-**authorships: **10**. **H-index=13** and **I10-index=15**, according to Google Scholar. All articles below are independent of my PhD-supervisor.
See Google scholar for details: http://scholar.google.no/citations?user=QtceKEwAAAAJ&hl=no

List of five selected publications
(citations excluding self-citations, * Equally contributing authors. † Corresponding author)

1. Robertson, Gundappa, [….], **Sandve** and Macqueen. *Lineage-specific rediploidization is a mechanism to explain time-lags between genome duplication and evolutionary diversification*. **Genome Biology** (2017) ***Accepted***
   Role: Writing, leading and conducting analyses of gene expression evolution

2. **Sandve**†, Rohlfs, and Hvidsten†. *Subfunctionalization versus neofunctionalization after whole-genome duplication.* **Nature genetics** *(2017)* ***Accepted***
   Role: Corresponding and shared-first author: Conceived the study**,** coordinating analyses, writing the manuscript

3. Lien, Koop, **Sandve**, et al. *The Atlantic salmon genome provides insights into rediploidization*. ***Nature*** 533 (2016). (**85 citations**)
   Role: Writing and leading/conducting analyses of genome evolution

4. The International Wheat Genome Sequencing Consortium. *A chromosome-based draft sequence of the hexaploid bread wheat (Triticum aestivum) genome*. ***Science*** 345 (2014). (**355 citations**)
   Role: Writing and conducting phylogenomic analyses

5. Marcussen***, Sandve*†**, et al. *Ancient hybridizations among the ancestral genomes of bread wheat*. ***Science*** 345 (2014). (**138 citations**)
   Role: Corresponding and shared-first author: conceived the study**,** carried out phylogenomics analyses, and writing the paper together with Marcussen.

INVITED TALKS AND PEER-REVIEWED CONFERENCE TALKS:

- **2016 "**Genome evolution after whole genome duplication – lessons from wheat and Atlantic salmon". Zoology Department talk, University of Aberdeen, UK.
- **2016 "**Genome evolution after whole genome duplication – lessons from Atlantic salmon. Institute talk "– Institute of Aquaculture, University of Stirling, UK.
- **2016 "**Genome evolution after whole genome duplication – lessons from Atlantic salmon". Department of Arctic and Marine Biology, University of Tromsø.
- **2013 "**Sequencing the wheat chromosome 7B". IWGSC workshop, Yokohama, Japan
- **2012** "Molecular adaptation to cooler climates and ecological diversification in Pooideae". Fargo, North Dakota, USA
- **2010 "**Lessons from a decade of frost tolerance research using forage grasses as a model system". Plant and Animal Genome, San Diego, USA

PROFESSIONAL ACHIEVEMENTS, PRIZES, AND AWARDS:

- 2016 Shortlisted for the National Norwegian Research Council 'young talent' award
- 2015 Selected for NMBU's 'talent program' - to develop young talented researchers
- 2015 Acquired 10M NOK grant for 'young research talents' (Havbruk-programme, NFR)
- 2012 Awarded Fulbright Research Fellowship
- 2012 Awarded Centennial Chair travel fellowship (from UMN/NMBU)