

Curriculum vitae – Jakob Hemmer-Hansen

Personal information

Family name, first name: Hemmer-Hansen, Jakob

Date of birth: 21-12-1974

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Degrees

- 2007: PhD (Population genetics), Department of Genetics and Ecology, Aarhus University, Denmark
- 2003: MSc (Population genetics), Department of Genetics and Ecology, Aarhus University, Denmark

Positions

- 2013 - : Senior Researcher, National Institute of Aquatic Resources (DTU Aqua), Technical University of Denmark
- 2007-2013: Researcher, Danish Institute for Fisheries Research (DIFRES)/National Institute of Aquatic Resources (DTU Aqua), Technical University of Denmark

Research interests

I am broadly interested in ecology and evolution, and use marine fishes as models to improve our understanding of evolution and population interactions in a high gene flow scenario. I apply candidate gene and population genomic approaches to identify genomic signatures of adaptation to local environments in natural populations, and use combinations of historical and contemporary samples to study both contemporary evolution and population dynamics with a high spatio-temporal resolution. These data allow us to identify population responses to past changes in climatic conditions, information which is critical for predicting future response to climate change. Furthermore, genetic information can be used for improving sustainable fisheries management through population identification and individual traceability.

Memberships of scientific committees

- 2014 - : ICES Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK)
- 2007 - : ICES Working Group on Application of Genetics in Fisheries and Mariculture (WGAGFM)

Academic and professional service

- Regular reviewer for more than twenty scientific journals
- Reviewer of grant applications for research councils in South Africa, the Czech Republic, USA, Estonia and Iceland
- Co-supervision of two PhD students (both completed)
- Co-supervision of four master students (three completed)
- External PhD examiner, Stellenbosch University, South Africa
- Chairman of PhD evaluating committee, DTU Aqua
- External examiner of Master's and bachelor's theses, Aarhus University and University of Copenhagen
- External examiner of graduate level written examination, Aarhus University

Grants

- EU Interreg, "MarGen – Expertise in marine and aquatic ecology and genomics for sustainable management of fish and shellfish in Skagerrak-Kattegat-Øresund" (2015-2018; Danish coordinating partner; 823.000 EUR)
- The European Fisheries Fund and the Ministry of Food, Agriculture and Fisheries of Denmark: "MSC certification

- of plaice fisheries in area IIIa – basic investigations and development of a management plan” (2012-2014; Project leader; 200.987 EUR)
- EU Interreg: “CodS – Restoration and management of cod in the Skagerrak/Kattegat” (2012-2014; WP leader and member of steering committee; 318.000 EUR)
- The Commission for Scientific Research in Greenland: “Genetic analyses of contemporary and historical samples for improved management of Greenlandic salmon” (2011-2012; Project leader; 13.400 EUR).
- Danish Ministry of Food, Agriculture and Fisheries and the European Fisheries Fund: “Population genetics of flounder in Danish waters” (2011-2012; Project leader; 47.000 EUR)
- European Science Foundation: “Science meeting - Thermal adaptation in aquatic ectotherms” (2009; meeting organizer; 21.400 EUR)
- Travel grants for research stay with Professor Patricia Schulte, University of British Columbia, Canada (2005; Elisabeth and Knud Petersen’s Foundation 4.400 EUR, Oticon Foundation, 1140 EUR, Knud Højgaard’s Foundation, 940 EUR)

Teaching

- 2011-: Invited teacher at the summer course on “Marine Ecological and Evolutionary Genomics” (under the EU coordination action Marine Genomics for Users (MG4U)), Roscoff, France (PhD/postdoc level)
- 2011: Teaching as a guest teacher at the PhD course “Molecular marker analysis of plant population structure and processes”, University of Copenhagen
- 2010-: Responsible for parts of the MSc DTU Aqua courses in “Genetic Methods in Fisheries and Aquatic Biodiversity Conservation” and “Genetic Methods in Aquaculture” as part of DTU Aqua’s master programme in Aquatic Science and Technology. Examiner at both courses
- 2002-2005. Teaching assistant, Aarhus University: Teaching at the courses “Fish and Fisheries Biology”, “Population Biology”, “Marine Ecology”, “Systems Ecology” and “Marine Biodiversity”

Organization of scientific meetings

2009. Thermal adaptation in aquatic ectotherms, Mols, Denmark. Meeting organizer

Invited presentations

- February 2015. Royal Swedish Academy of Sciences, 275 year anniversary symposium, Gothenburg, Sweden
- February 2014. Centre for Ecological and Evolutionary Synthesis (CEES), University of Oslo, Norway
- November 2013. Ecological Genetics Research Unit, University of Helsinki, Finland

Publications

Peer-reviewed publications

I have co-authored 24 publications, with an average of 32 citations per publication, an h-index of 14 and m-index of 1.75 in ISI Web of Science.

Bekkevold D., Helyar S.J., Limborg M.T., Nielsen E.E., **Hemmer-Hansen J.**, Clausen L.A.W., Carvalho G.R., FishPopTrace Consortium (2015) Gene-associated markers can assign origin in a weakly structured fish, Atlantic herring. *ICES Journal of Marine Science*, available online, doi:10.1093/icesjms/fsu247.

Hemmer-Hansen J., Therkildsen N.O., Pujolar J.M. (2014) Population genomics of marine fishes: next generation prospects and challenges. *Biological Bulletin*, 227, 117-132.

Bekkevold D., Jacobsen L., **Hemmer-Hansen J.**, Berg S., Skov C. (2015) From regionally predictable to locally complex population structure in a freshwater top predator: river systems are not always the unit of connectivity in Northern Pike *Esox lucius*. *Ecology of Freshwater Fish*, 24, 305-316.

Eero M., **Hemmer-Hansen J.**, Hüseyin K. (2014) Implications of stock recovery for a neighboring management unit: experience from the Baltic cod, *ICES Journal of Marine Science*, 71, 1458-1466.

Bonanomi S., Therkildsen N.O., Hedeholm R.B., **Hemmer-Hansen J.**, Nielsen E.E. (2014) The use of archived tags in retrospective genetic analysis of fish. *Molecular Ecology Resources*, 14, 616–621.

Milano I., Babbucci M., Cariani A., Atanassova M., Bekkevold D., Carvalho G.R., Espiñeira M., Fiorentino F., Garofalo G., Geffen A.J., **Hemmer-Hansen J.**, Helyar S.J., Nielsen E.E., Ogden R., Patarnello T., Stagioni M., FishPopTrace Consortium, Tinti F., Bargelloni L. (2014) Outlier SNP markers reveal fine-scale genetic structuring across European hake populations (*Merluccius merluccius*). *Molecular Ecology*, 23, 118–135.

Hemmer-Hansen J., Therkildsen N.O., Meldrup D., Nielsen E.E. (2014) Conserving marine biodiversity: insights from life-history trait candidate genes in Atlantic cod (*Gadus morhua*). *Conservation Genetics*, 15, 213–228.

Ulrich C., Boje J., Cardinale M., Gatti P., LeBras Q., Andersen M., **Hemmer-Hansen J.**, Hintzen N.T., Jacobsen J.B., Jonsson P., Miller D.C., Nielsen E.E., Rijnsdorp A.D., Sköld M., Svedäng H., Wennhage H. (2013) Variability and connectivity of plaice populations from the Eastern North Sea to the Western Baltic Sea, and implications for assessment and management. *Journal of Sea Research*, 84 (S1), 40-48.

Hemmer-Hansen J., Nielsen E.E., Therkildsen N.O., Taylor M.I., Ogden R., Geffen A., Bekkevold D., Helyar S., Pampoulie C., Johansen T., FishPopTrace Consortium, Carvalho G.R. (2013) A genomic island linked to ecotype divergence in Atlantic cod. *Molecular Ecology*, 22, 2653–2667.

Therkildsen N.O., **Hemmer-Hansen J.**, Hedeholm R.B., Wisz M.S., Retzel A., Nielsen E.E. (2013) Spatiotemporal SNP analysis reveals pronounced biocomplexity at the northern range margin of Atlantic cod *Gadus morhua*. *Evolutionary Applications*, 6, 690-705.

Therkildsen N.O., **Hemmer-Hansen J.**, Als T.D., Swain D.P., Morgan J., Trippel E.A., Palumbi S.R., Meldrup D., Nielsen E.E. (2013) Microevolution in time and space: SNP analysis of historical DNA reveals dynamic signatures of selection in Atlantic cod. *Molecular Ecology*, 22, 2424-2440.

Nielsen E.E., Cariani A., Mac Aoidh E., Maes G.E., Milano I., Ogden R., Taylor M., **Hemmer-Hansen J.**, Babbucci M., Bargelloni L., Bekkevold D., Diopere E., Grenfell L., Helyar S., Limborg M.T., Martinsohn J.T., McEwing R., Panitz F., Patarnello T., Tinti F., Van Houdt J.K.J., Volckaert F.A.M., Waples R.S., Carvalho G.R., Albin J.E.J., Baptista J.M.V., Barmintsev V., Bautista J.M., Bendixen C., Berge J.P., Blohm D., Cardazzo B., Diez A., Espiñeira M., Geffen A.J., Gonzalez E., Gonzalez-Lavin N., Guarniero I., Jerome M., Kochzius M., Krey G., Mouche O., Negrisolo E., Piccinetti C., Puyet A., Rastorguev S., Smith J.P., Trentini M., Verrez-Bagnis V., Volkov A., Zanzi A. (2012) Gene-associated markers provide tools for tackling illegal fishing and false eco-certification. *Nature Communications*, 3, Art. No. 851.

Poulsen N.A., **Hemmer-Hansen J.**, Loeschcke V., Carvalho G.R., Nielsen E.E. (2011) Microgeographical population structure and adaptation in Atlantic cod (*Gadus morhua*): spatio-temporal insights from gene-associated DNA markers. *Marine Ecology Progress Series*, 436, 231–243.

Hemmer-Hansen J., Nielsen E.E., Meldrup D., Mittelholzer C. (2011) Identification of single nucleotide polymorphisms in candidate genes for growth and reproduction in a nonmodel organism; the Atlantic cod, *Gadus morhua*. *Molecular Ecology Resources*, 11 (Suppl. 1), 71–80.

Helyar S.J., **Hemmer-Hansen J.**, Bekkevold D., Taylor M.I., Ogden R., Limborg M.I., Cariani A., Maes G.E., Diopere E., Carvalho G.R., Nielsen E.E. (2011) Application of SNPs for population genetics of nonmodel organisms: new opportunities and challenges. *Molecular Ecology Resources*, 11 (Suppl. 1), 123–136.

Nielsen E.E.*, **Hemmer-Hansen J.***, Poulsen N.A., Loeschcke V., Moen T., Johansen T., Mittelholzer C., Taranger G.L., Ogden R., Carvalho G.R. (2009) Genomic signatures of local directional selection in a high gene flow marine organism; the Atlantic cod (*Gadus morhua*). *BMC Evolutionary Biology*, 9, Art. No. 276.

* Joint first authorship

Nielsen E.E., **Hemmer-Hansen J.**, Larsen P.F., Bekkevold D. (2009) Population genomics of marine fishes: identifying adaptive variation in space and time. *Molecular Ecology*, 18, 3128–3150.

Limborg M.T., Pedersen J.S., **Hemmer-Hansen J.**, Tomkiewicz J., Bekkevold D. (2009) Genetic population structure of European sprat *Sprattus sprattus*: differentiation across a steep environmental gradient in a small pelagic fish. *Marine Ecology – Progress Series*, 379, 213–224.

Nielsen E.E., Wright P.J., **Hemmer-Hansen J.**, Poulsen N.A., Gibb L.M., Meldrup D. (2009) Micro geographical population structure of cod *Gadus morhua* in the North Sea and west of Scotland: the role of sampling loci and individuals. *Marine Ecology – Progress Series*, 376, 213–225.

Hansen M.M., **Hemmer-Hansen J.** (2007) Landscape genetics goes to sea. *Journal of Biology*, 6; 6.

Hemmer-Hansen J., Nielsen E.E., Frydenberg J., Loeschcke V. (2007) Adaptive divergence in a high gene flow environment: Hsc70 variation in the European flounder (*Platichthys flesus* L.). *Heredity*, 99, 592–600.

Wenne R., Boudry P., **Hemmer-Hansen J.**, Lubieniecki K.P., Was A., Kause A. (2007) What role for genomics in fisheries management and aquaculture? *Aquatic Living Resources*, 20, 241–255.

Hemmer-Hansen J., Nielsen E.E., Grønkjær P., Loeschcke V. (2007) Evolutionary factors shaping the genetic population structure of marine fishes; lessons from the European flounder (*Platichthys flesus* L.). *Molecular Ecology*, 16, 3104–3118.

Larsen P.F., Nielsen E.E., Williams T.D., **Hemmer-Hansen J.**, Chipman J.K., Kruhøffer M., Grønkjær P., George S.G., Dyrskjøt L., Loeschcke V. (2007) Adaptive Differences in Gene Expression in European Flounder (*Platichthys flesus*). *Molecular Ecology*, 16, 4674–4683.

Book chapters

Nielsen E.E., **Hemmer-Hansen J.**, Bekkevold D. (2012) Development and application of molecular tools to investigate the mislabelling of cod sold in Sweden. In: *Case studies in food safety and authenticity: Lessons from real-life situations* (Hoofar, J. ed.). Woodhead Publishing, Cambridge.