

Curriculum vitae — Niku, Markku Mikael

4 January 2016

Personal information

Date and place of birth: 3.5.1974, Raahe
Gender: male
Citizenship: Finnish
Current residence: Marmoritie 10d18, 00710 Helsinki, Finland

Education and degrees

Doctor of Philosophy: University of Helsinki, Department of Basic Veterinary Sciences, 18.1.2007 (contact at faculty office: study planner Anu Kanerva, anu.kanerva@helsinki.fi). Thesis "Fates of blood: Studies on stem cell differentiation potential and B lymphocyte generation in chimeric cattle", available at ethesis.helsinki.fi.
Master of Philosophy: University of Oulu, Department of Biochemistry, 17.3.1999. Major subject: biochemistry. Minors: chemistry, animal physiology; additional studies in information science. Master's thesis on the development of renal vasculature and Wnt-4.

Linguistic skills

Finnish (native); English (fluent; academic examination); Swedish (academic examination: good skills); German (academic examination: reading).

Methodological expertise

Various *in situ* detection methods, CRISPR genome modification technology, laser microdissection, general molecular biology, cell culture.

Current position

University lecturer (anatomy and developmental biology) and the head of the laser microdissection core facility at the Department of Veterinary Biosciences (professor Antti Iivanainen), from June 2010. Research career phase 2 (recognized researcher or post-doctoral researcher).

Previous work experience

University lecturer (physiology and cell biology), Department of Applied Chemistry and Microbiology, University of Helsinki (professor Marja Mutanen), 1.8.2007 – 31.5.2010.

Assistant, Department of Veterinary Anatomy, University of Helsinki (professor Antti Iivanainen), 1.1.1999 – 31.7.2007. Research and teaching histology and developmental biology.

Research assistant, Division of Veterinary anatomy, 7.9.1998 – 1.1.1999.

Grant researcher and research assistant, Department of Biochemistry, University of Oulu (professor Seppo Vainio), April-August 1998.

Research assistant, Department of Clinical Chemistry, WHO Collaboration Center, University of Oulu, May-September 1997.

Research funding

University of Helsinki, 150 000€ for “Impact of fetal intestinal microbiota on the early development of the immune system”, 2016-2018.

Finnish Veterinary Foundation, 4000€ for next-generation 16S rRNA amplicon sequencing of the bovine fetal intestinal microbiota, 2015.

Finnish Veterinary Association, 4000€ for studies of fetal development of the bovine intestinal microbiota and the intestinal immune system, 2015.

Albin Johansson Foundation, 5000€ for studies of DNA demethylation mechanisms, 2015.

Albin Johansson Foundation, 10000€ for studies of DNA demethylation mechanisms, 2014.

The Finnish Veterinary Association, 4000€ for studies of erythroid differentiation in cattle, 2014.

Yrjö Jahnsson Foundation, 15000€ for studies of intestinal epithelial stem cells and cancer, 2010.

Albin Johansson Foundation, 10000€ for the same project, 2010.

Significant research partner and grant application contributor in several larger project grants, primarily in research groups led by professors Antti Iivanainen and Marja Mutanen.

Leadership and supervision

PI of the project “Impact of fetal intestinal microbiota on the early development of the immune system” and responsible for several independent subprojects in professor Iivanainen’s laboratory.

Official supervisor of two PhD theses, 4 licentiate theses, one Master thesis, approximately 20 Bachelor theses and two technical college diplomas.

Merits in teaching and pedagogical competence

Basic university pedagogy training (25 credits) at the University of Helsinki and active participation in local and international pedagogy meetings and conferences.

Teacher in charge for preclinical basic sciences education (“The Functional Organism”) at the Faculty of Veterinary Medicine since 2014.

Member of the Faculty of Veterinary Medicine Board of Study Affairs since 2014.

Current teaching responsibilities:

- Annually:
 - Solut ja kudokset (Cells and tissues), 3 ECTS, 65-70 students; teacher in charge.
 - Kehitysbiologia (Developmental biology), 2 ECTS, 65-70 students; teacher in charge.
 - Vertaileva anatomia ja fysiologia (Comparative anatomy and physiology), 2 ECTS, 65-70 students; teacher in charge.
 - Elinten mikroskooppinen anatomia (Microscopic anatomy of organs), 2 ECTS, 65-70 students; teacher in charge.
 - Verenkierto ja hengitys (Circulatory and respiratory systems), 4.5 ECTS, 65-70 students; responsible for teaching histology and introductory immunology.
 - Ruoansulatus ja energia-aineenvaihdunta (Digestive system and energy metabolism), 10.5 ECTS, 65-70 students; responsible for histology teaching.
- Supervision of Licentiate, Master and Bachelor theses as described above.
- Technical courses for graduate students (primarily immunostaining techniques).

Development of teaching:

- Development of digital histology teaching, 2015- ongoing.
- Development of the use of online learning journals and formative peer assessment, 2012-2015.

- Responsible for the design and implementation of joint teaching in cell biology, physiology and anatomy in two faculties at the Viikki campus, 2007-2010.

Production of teaching materials:

- Digitalization of the veterinary histology teaching collection, 2014-2015.
- Assistant editor of the final edition of the medical entrance exam textbook Galenos, and reviewer of the latest edition of the Finnish textbook of developmental biology.
- Member of the VIELO team producing virtual 3D models for veterinary anatomy teaching.

Dissemination and publication of pedagogical innovations:

- Posters and short talks in two international medical/veterinary education conferences (AMEE and VetEd).
- Pedagogical case report on formative assessment of learning journals published in *Yliopistopedagogiikka* 2/2014.

Teaching awards:

- Member of the University of Helsinki Teachers' Academy since 2014.
- Award of the Association of Veterinary Students for an inspiring teacher (Kannuspalkinto), 2015.
- Award for good teaching at the Faculty of Veterinary Medicine, 2011.
- Educational technology team award: VIELO (virtual 3D models in anatomy), 2002.

Other academic merits

Member of the Finnish Society for Immunology since 2010.

Member of the American Association for Cancer Research since 2009.

Member of the Finnish Association for Science Editors and Journalist since 2004.

Referee in the European Journal of Immunology since 2015 and for the International Journal of Molecular Sciences since 2014.

Scientific and societal impact of research

Active science journalist with approximately 50 articles popularizing bioscientific research and discussing academic research and teaching.

Please see the list of scientific publications below.

Publications

Peer-reviewed scientific articles

Mykkänen AK, **Niku M**, Ilves M, Koho NM. Expression of monocarboxylate transporters I and IV and the ancillary protein CD147 in the intestinal tract of healthy horses and ponies. *Am J Vet Res.* 2015;76(2):161-169.

Liljavirta J, **Niku M**, Pessa-Morikawa T, Ekman A, Iivanainen A. Expansion of the preimmune antibody repertoire by junctional diversity in *Bos Taurus*. *PLoS One* 2014;9(6):e99808.

Marttinen M, Pajari AM, Päivärinta E, Storvik M, Marttinen P, Nurmi T, **Niku M**, Piironen V, Mutanen M. Plant sterol feeding induces tumor formation and alters sterol metabolism in the intestine of *Apc(Min)* mice. *Nutr Cancer* 2014;66(2):259-269.

Liljavirta J, Ekman A, Knight JS, Pernthaner A, Iivanainen A, **Niku M**. Activation-induced cytidine deaminase (AID) is strongly expressed in the fetal bovine ileal Peyer's patch and spleen and is associated with expansion of the primary antibody repertoire in the absence of exogenous antigens. *Mucosal Immunology* 2013;6(5):942-949.

Niku M, Liljavirta J, Durkin K, Schroderus E, Iivanainen A. The bovine genomic DNA sequence data reveal three IGHV subgroups, only one of which is functionally expressed. *Developmental & Comparative Immunology* 2012;37(3-4):457-461.

Pessa-Morikawa T, **Niku M**, Iivanainen A. Fetal bovine bone marrow is a rich source of CD34(+) hematopoietic progenitors with myelo-monocytic colony-forming activity. *Developmental & Comparative Immunology* 2012;36(3):572-577.

Ekman A, Pessa-Morikawa T, Liljavirta J, **Niku M**, Iivanainen A. B-cell development in bovine fetuses proceeds via a pre-B like cell in bone marrow and lymph nodes. *Developmental & Comparative Immunology* 2010;34(8):896-903.

Ekman A, **Niku M**, Liljavirta J, Iivanainen A. *Bos taurus* genome sequence reveals the assortment of immunoglobulin and surrogate light chain genes in domestic cattle. *BMC Immunology* 2009; 10:22.

Niku M, Pessa-Morikawa T, Taponen J, Iivanainen A. Direct observation of hematopoietic progenitor chimerism in fetal freemartin cattle. *BMC Veterinary Research* 2007; 3:29.

Niku M, Pessa-Morikawa T, Ra R, Ekman A, Iivanainen A. Expression of CD34 mRNA and protein in cattle. *Veterinary Immunology and Immunopathology* 2007; 117(3-4):162-72.

Itäranta P, Chi L, Seppänen T, **Niku M**, Tuukkanen J, Peltoketo H, Vainio S. Wnt-4 signaling is involved in the control of smooth muscle cell fate via Bmp-4 in the medullary stroma of the developing kidney. *Developmental Biology* 2006;293(2):473-83.

Niku M, Ilmonen L, Pessa-Morikawa T & Iivanainen A. Limited contribution of circulating cells to the development and maintenance of nonhematopoietic bovine tissues. *Stem Cells* 2004;22(1): 12-20.

Pessa-Morikawa T, **Niku M** & Iivanainen A. Persistent differences in the level of chimerism in B versus T cells of freemartin cattle. *Developmental & Comparative Immunology* 2004;28(1):77-87.

Niku M, Pessa-Morikawa T, Andersson LC & Iivanainen A. Oligoclonal Peyer's patch follicles in the terminal small intestine of cattle. *Developmental & Comparative Immunology* 2002;26(8): 689-695.

Non-refereed scientific articles

Mutanen M, Niku M, Oikarinen S. Green leafy vegetables in cancer prevention. In: *Vegetables, Whole Grains, and Their Derivatives in Cancer Prevention*. Editors: Mutanen M & Pajari, A-M. Springer 2010, pp. 31-45.

Publications intended for the general public

Approximately 50 articles popularizing bioscientific research, mostly in *Yliopistolehti* and *Helsingin sanomat*.