

BIOGRAPHICAL SKETCH

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| NAME HOFMANN, MARIE-CLAUDE | POSITION TITLE ASSOCIATE PROFESSOR | | |
|--|---------------------------------------|-----------|--|
| eRA COMMONS USER NAME hofmannmc | | | |
| EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as</i> | | | |
| INSTITUTION AND LOCATION | DEGREE <i>(if applicable)</i> | YEAR(s) | FIELD OF STUDY |
| Department of Biology, University of Lausanne, Lausanne, Switzerland | B.S. | 1977 | Biology |
| Department of Biology, University of Lausanne, Lausanne, Switzerland | Ph.D. | 1983-1988 | Cell Biology, Cancer Research |
| Department of Pathology, University of Zürich Medical School, Zürich, Switzerland | Post-doctoral | 1988-1989 | Pathology, Cancer Research |
| The Burnham Institute, La Jolla, CA | Post-doctoral | 1989-1995 | Developmental and Reproductive Biology |

A. Positions, Awards and Honors:

- 1978-83: Research technician, Department of Oncology, University of Zürich Medical School, Zürich, Switzerland 1983-87
- 1983-88: Ph.D. student, Department of Oncology, University of Zürich Medical School, Zürich, Switzerland
- 1983-87: Predoctoral Fellowship, Swiss National Foundation for Scientific Research
- 1987-89: Postdoctoral Fellow (Swiss Anti-Cancer League fellowship). Department of Pathology, University of Zürich Medical School, Zürich, Switzerland
- 1989-95: Postdoctoral fellow, The Burnham Institute, La Jolla, CA
- 1989-90: Postdoctoral Fellowship, Swiss National Foundation for Scientific Research.
- 1990-91: Postdoctoral Fellowship, Swiss Foundation for Medical and Biological Research.
- 1992-95: National Research Service Award, National Cancer Institute, USA
- 1995-2001: Assistant Professor, Department of Biology, University of Dayton, Dayton, OH, USA
- 2001-2006: Associate Professor, Department of Biology, The University of Dayton
- 2002 Tenured faculty, University of Dayton, Dayton, OH, USA
- 2005 George E. Nolan Award for Excellence in Research (Sigma Xi Research Society)
- 2005 Adjunct Associate Professor, Department of Biomedical, Industrial and Human Factors Engineering, College of Engineering and Computer Sciences, Wright State University, Dayton, OH
- 2006- Associate Professor, Department of Veterinary Biosciences, University of Illinois at Urbana-Champaign, Urbana, IL
- 2006-: Associate Professor, Institute for Genomic Biology, University of Illinois at Urbana-Champaign, Urbana, IL

B. Selected Relevant Publications:

- Hofmann MC**, Jeltsch W, Brecher J and Walt H (1989). Alkaline phosphatase isozymes in human testicular germ cell tumors, their precancerous stage, and three related cell lines. *Cancer Research* 49, 4696-4700
- Emmerich P, Jauch A, **Hofmann MC**, Cremer T and Walt H (1989). Interphase cytogenetics in paraffin embedded sections from human testicular germ cell tumor xenografts and in corresponding cultured cells. *Lab. Invest.* 61: 235-242
- Walt H, Emmerich P, Cremer T, **Hofmann MC** and Bannwart F (1989). Supernumerary chromosome 1 in Interphase nuclei of atypical germ cells in paraffin-embedded human seminiferous tubules. *Lab. Invest.* 61: 527-531
- Narisawa S, **Hofmann MC**, Ziomek CA and Millán JL (1992). Embryonic alkaline phosphatase is expressed at M-phase in the spermatogenic lineage of the mouse. *Development* 116: 159-165
- Hofmann MC**, Narisawa S, Hess RA and Millán JL (1992) Immortalization of germ cells and somatic testicular cells using the SV40 large T antigen. *Exp.Cell Res.* 201: 417-435
- Cooker LA, Brooke CD, Kumari M, **Hofmann MC**, Millán JL and Goldberg E (1993): Genomic structure and promoter activity of the human testis lactate dehydrogenase gene. *Biol. Reprod.* 48, 1309-1319
- Hofmann MC** and Millán JL (1993): Developmental expression of alkaline phosphatase genes: Re-expression in germ cell tumors and immortalized germ cells. *Eur. Urol.* 23: 38-45
- Hofmann MC**, Hess RA, Goldberg E and Millán JL (1994): Immortalized germ cells undergo meiosis *in vitro*. *Proc.Natl.Acad.Sci.USA*, 91: 5533-5537
- Hofmann MC**, Abramian D S and Millán JL (1995): A haploid and a diploid cell cycle coexist in an *in vitro* immortalized spermatogenic cell line. *Dev. Genetics*, 16: 119-127
- Hofmann MC**, Abramian D, Weissig H, Richardson LL and Millán JL (1996). Establishment of meiotic germ cell lines and their use to study spermatogenesis *in vitro* . In: Cellular and Molecular Regulation of Testicular Cells, C. Desjardins (ed), Springer Verlag, New York, pp 45-64.
- Tsonis PA, Del Rio-Tsonis K, Wallace JL, Burns JC, **Hofmann MC**, Millán JL and Washabaugh CH (1996): Can insights into urodele limb regeneration be achieved with cell cultures and retroviruses. *Int.J.Dev.Biol.* 40: 813-816
- Wolkowicz MJ, Coonrod SM, Reddi PP, Millan JL, **Hofmann MC** and Herr JR (1996): Refinement of the differentiated phenotype of the spermatogenic cell line GC-2spd(ts). *Biol. Reprod.* 55: 923-932
- Hofmann MC** and Millán JL (1998). Establishment of Mammalian Testicular Cell Lines. *Methods Cell Biol.* 57: 93-110.
- Encina NR, Billotte WG and **Hofmann MC** (1999) Immunomagnetic isolation of osteoprogenitors from human bone marrow stroma. *Lab. Invest.* 79: 449-457.
- Billotte WG and **Hofmann MC**. (1999). Establishment of a shear stress protocol to study the mechanosensitivity of human primary osteogenic cells *in vitro*. *Biomed. Sci. Instrum.* 35: 327-332
- van der Wee KS and **Hofmann MC** (1999) An *in vitro* tubule assay identifies HGF as a morphogen for the formation of seminiferous tubules in the postnatal mouse testis. *Exp.Cell Res.* 252:175-185.
- Billotte WG, Dumas K and **Hofmann MC** (2001) Transcriptional pathways induced by fluid shear stress in mouse preosteoblast cells. *Biomed.Sci. Instrum.* 37:1-6
- van der Wee KS, Johnson E, Dirami G, Dym M and **Hofmann MC**. Immunomagnetic isolation and long term culture of mouse type A spermatogonia. (2001) *J. Androl.* 22:696-704
- ***Hofmann MC**, van der Wee KS, Dargart J, Dirami G and Dym M. (2003). Establishment and characterization of neonatal mouse Sertoli cell lines. *J. Androl.* 24: 120-130.
- Dettin LE, Ravindranath N , **Hofmann MC**, and Dym M. (2003) Morphological characterization of the spermatogonial subtypes in the neonatal mouse testis. *Biol. Reprod.*69, 1565-1571.
- Hofmann MC** and Dym M (2004). Long Term Cultures of Mammalian Spermatogonia. In: *Sertoli Cell Biology*. Eds. Skinner M. and Griswold M., Academic Press, San Diego, pp 449-470.
- ***Hofmann MC**, Braydich-Stolle L., Dettin L., Johnson E, and Dym M. (2005) Immortalization of mouse germ-line stem cells. *Stem Cells* 23: 200-210.
- ***Hofmann MC**, Braydich-Stolle L, and Dym M. (2005) Isolation of male germ line stem cells; influence of

- GDNF. *Dev Biol.* 279: 114-24.
- Chen C, Ouyang W, Grigura V, Zhou Q, Carnes K, Lim H, Zhao GQ, Arber S, Kurpios N, Murphy TL, Cheng AM, Hassell JA, Chandrashekar V, **Hofmann MC**, Hess RA, and Murphy KM. (2005). ERM is required for transcriptional control of the spermatogonial stem cell niche. *Nature* 436: 1030-1034
- Braydich-Stolle L, Hussain S, Schlager J and **Hofmann MC**. (2005) *In vitro* cytotoxicity of nanoparticles in mammalian germ-line stem cells, *Toxicol. Sci.* 88: 412-419.
- Braydich-Stolle L, Dym M and **Hofmann MC** (2005) Role of glial cell line-derived neurotrophic factor (GDNF) in germ-line stem cell fate. In: Testicular Cell Dynamics and Endocrine Signaling. Eds. Hardy M and Griswold M, *Ann. NY Acad. Sciences*, 1061:94-9.
- Hess RA, Cooke PS, **Hofmann MC** and Murphy KM. (2006) Mechanistic insights into the regulation of the spermatogonial stem cell niche. *Cell Cycle* 5:1164-70.
- Cooke PS, Hess RA, Simon L, Schlessner HN, Carnes K, Tyagi G, **Hofmann MC** and Murphy KM. (2006). The transcription factor Ets-Related Molecule (ERM) is essential for spermatogonial stem cell maintenance and self-renewal. *Animal Reproduction* 3: 98-107.
- Braydich-Stolle, Kostereva NV, Dym M, and **Hofmann MC** (2007). Role of Src kinases and N-Myc in spermatogonial stem cell proliferation. *Dev Biol.* 304: 34-45.
- Hofmann MC** and Braydich-Stolle L (2007). Neurotrophic factors in the post-natal development of the male germ-line. In: *The Y Chromosome and Male Germ Cell Biology in Health and Diseases*. Eds Lau Y-FC and Chan WY, World Scientific Publishing, Hackensack, NJ, pp. 149-184.
- He Z, Jiang J, **Hofmann MC** and Dym M. (2007). Gfra1 silencing in mouse spermatogonial stem cells results in their differentiation via the inactivation of RET tyrosine kinase. *Biol Reprod.* 77: 723-733.
- Morrow CMK, Hostetler CE, Griswold MD, **Hofmann MC**, Murphy KM, Cooke PS and Hess RA (2007). ETV5 is required for continuous spermatogenesis in adult mice and may mediate blood-testes barrier function and testicular immune privilege. *Ann NY Acad Sci.* 1120:144-151.
- Schlessner HN, Simon L, **Hofmann MC**, Murphy KM, Hess RA and Cooke PS (2008). Effects of Ets variant 5 (ERM) on testis and body growth, time course of spermatogonial stem cell loss and fertility in mice. *Biol Reprod.* 78: 483-489.
- *[He Z](#), [Jiang J](#), [Kokkinaki M](#), [Golestaneh N](#), [Hofmann MC](#), and [Dym M](#) (2008). GDNF up-regulates c-fos transcription via the Ras/ERK1/2 pathway to promote mouse spermatogonial stem cell proliferation. *Stem Cells*, 26: 266-278.
- Hofmann MC** (2008). GDNF signaling within the spermatogonial stem cell niche (2008). *Mol Cell Endocrinol*, 288: 95-103.
- Kostereva NV and **Hofmann MC** (2008). Regulation of the spermatogonial stem cell niche. *Reprod Domest Anim*, 43:386-92.
- Chu C, Schmidt JJ, Carnes K, Zhang Z, Kong HJ and **Hofmann MC** (2008). Three-dimensional synthetic niche components to control germ cell proliferation. *Tissue Engineering*. In press.
- Stolle L, Lucas B, Lee T, Schlager J, Hussain S and **Hofmann MC**. Silver nanoparticles disrupt GDNF signaling in male germ-line stem cells. Submitted.
- Simon L, Ekman G, Kostereva N, Zhang Z, Hess RA, **Hofmann MC** and Cooke P. Direct transdifferentiation of spermatogonial stem cells into reproductive and non-reproductive tissues of all germ layers. Submitted.

* Asterisks denote publications as corresponding author or co-senior author

Current Support:

1. Active: R01-HD044543
Award Period: 12/1/04-11/30/09.
Direct Costs: \$ 200,000/year
Agency: NIH-National Institutes of Child Health and Human Development
Title: Isolation and Characterization Testis Stem Cells
Role on project: Principal Investigator

The principal objective of this project is to understand the effects of the growth factor GDNF on self-renewal and differentiation of spermatogonial stem cells.

2. Active: KO2-HD054607
Award period: 08/1/07-07/31/12
Direct Costs: \$ 111,000/year
Agency: NIH-National Institutes of Child Health and Human Development
Title: Isolation and Characterization of Testis Stem Cells; Influence of GDNF
Role on project: Principal Investigator

This Career Award covers 75% of the PI salary, as well fringe benefits and some travel costs. It provides more time for the PI to develop new areas of research, all pertaining to GDNF signaling. These new areas include 1) assessment of the influence of toxicants on GDNF signaling and 2) modulation/integration of different signaling pathways within the SSC niche.

Pending:

Award period: 12/01/08-11/30/10
Direct costs; \$ 150,000 (first year)
Agency: NIH- National Heart, Lung and Blood Institute
Title: Differentiation potential of mouse stem cells in tri-dimensional synthetic niches
Role on project: Principal Investigator

This grant proposal explores the influence of the composition and physical properties of synthetic alginate matrices on the self-renewal and differentiation potential of different types of stem cells.

Completed/Previous 3 years:

D2-0449, TOPIC NO. SB041-013, SBIR phase II
Award period: 09/01/05-12/31/07
Agency: DOD-DARPA
Title: Real Time Monitoring of Signaling Pathways in Biological Cells.
Role on project: Co-Principal Investigator. Principal Investigator: Melanie Tomczak, UES, Inc, Dayton, OH.

The principal objective of this project was to develop bio-nanoparticles for the visualization and modulation of intracellular signaling pathways in germ cells and somatic cells.