CURRICULUM VITAE

NAME: Leif Oxburgh

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DATE OF BIRTH: April 29, 1968

PLACE OF BIRTH: Stockholm, Sweden

EDUCATION:

1992 D.V.M. Swedish University of Agricultural Sciences
1998 Ph.D. Swedish University of Agricultural Sciences (Virology; Dr. Tommy Linné, Advisor)

POSTDOCTORAL TRAINING:

1999-2004 Research Fellow in Molecular and Cellular Biology, Faculty of Arts and Sciences, Harvard University (Developmental Genetics; Dr. Elizabeth Robertson, Advisor)

ACADEMIC APPOINTMENTS:

2004-2008 Faculty Scientist I, Maine Medical Center Research Institute
2005- Graduate faculty, Department of Biochemistry, University of Maine
2005- Graduate faculty, Department of Applied Medical Sciences, University of Southern Maine
2006- Graduate faculty, Graduate School of Biomedical Sciences, University of Maine
2006- Director, Molecular Phenotyping Core Facility, Maine Medical Center Research Institute
2008-2014 Faculty Scientist II, Maine Medical Center Research Institute
2010- Associate Professor, Tufts University School of Medicine. Member, Cell, Molecular and Developmental Biology Program, Sackler School of Graduate Biomedical Sciences
2014- Faculty Scientist III, Maine Medical Center Research Institute

AWARDS AND HONORS:

1999-2002 Wenner-Gren Foundations of Sweden Fellowship
2001 Medical Research Council of Sweden Fellowship
2002-2004 The Medical Foundation (Boston, MA) Fellowship
2006-2009 Satellite Research Foundation Research Award

CONSULTING AND MAJOR COMMITTEE ASSIGNMENTS:

National and Regional

Current:

2006-	American Heart Association Peer Review Committee (Cardiorenal)
2009-	Associate Editor, BMC Developmental Biology
Ad hoc	Special emphasis panels NIDDK
Ad hoc	NIH-CSR study section KMBD
2012-	Editorial Board, ISRN Nephrology
2015-	Chief Science Coordinator, Solving Organ Shortage http://www.solvingorganshortage.org/research

Maine Medical Center Research Institute

2005-2013	Member & vice-chair, Institutional Animal Care and Use Committee
2013-	Chair, Institutional Animal Care and Use Committee
2005-	MMCRI graduate education committee
2006-	MMCRI internal grant review committee
2008-2009	Co-chair faculty search committee Center for Stem and Progenitor Cell Biology
2008-	MMCRI program committee
2009-2012	MMCRI IT committee
2012-2013	MMCRI faculty search committee

University of Maine

2005-2008	Admissions committee for NSF-funded IGERT doctoral program in functional genomics at the University of Maine
2006-2011	Admissions committee for Graduate School of Biomedical Sciences, University of Maine

PROFESSIONAL SOCIETIES:

2004-	International Society for Stem Cell Research
2005-	American Society for Nephrology
2006-	Society for Developmental Biology
2009-	American Physiological Society

MAJOR RESEARCH INTERESTS:

1. Regulation of self renewal versus differentiation in nephron progenitor cells

2. Development of *ex vivo* culture systems to propagate nephron progenitor cells for regenerative therapy applications

3. Role of BMP and TGFβ signaling in juvenile nephrosis syndromes

4. Organogenetic events in the development of clear cell renal cell carcinoma

RESEARCH FUNDING:

Current

NIH 2R01DK078161-06	"Defining the progenitor cell niche of the developing kidney" PI: Leif Oxburgh 04/01/13 – 03/30/17
NIH P30GM106391	"Molecular Phenotyping Core" PI: Leif Oxburgh 09/01/13-05/31/18
Maine Cancer Foundation	"Understanding the role of FOXD1 in renal cell carcinoma angiogenesis" PI: Leif Oxburgh 07/01/14-06/30/16
NIH P30GM106391	"Phase III COBRE in stem & progenitor cell biology and regenerative medicine" PI: Don Wojchowski Co-I: Leif Oxburgh 09/01/13-05/31/18
Diabetic complications Consortium	"Nephron Progenitor Culture Technology for Ex Vivo Nephrogenesis" PI: Leif Oxburgh 11/01/14-10/31/15
NIH/NIDDK 1R24DK106743	"Application of progenitor niche signals to ex vivo nephrogenesis" MPIs: Leif Oxburgh (contact PI), Thomas Carroll, Ondine Cleaver, David Kaplan. 07/01/2015—6/30/2020

Past

Satellite Healthcare	"Defining the progenitor cell niche of the developing kidney" PI: Leif Oxburgh 7/1/06 – 6/30/09
NIH DK078161-02S1	"Defining the progenitor cell niche of the developing kidney" PI: Leif Oxburgh
NIH NCS LOI3-RT-01-M	National Children's Study Formative Research Project in Real-Time Analytics PI: John Bancroft 04/01/2011 – 03/31/2012 Nucleic acids analysis Core Director: Leif Oxburgh
DoD PR110346	"Culture Systems for Regenerative Kidney Therapy" PI: Leif Oxburgh

09/01/2012 – 04/30/2014

RESEARCH TRAINEES:

Postdoctoral:

2006-08	Ulrika Blank; current position: Scientist, Lund University Hospital, Lund, Sweden
2009-11	Beth Lindroth Hill; current position: Flow cytometry applications specialist, Verity Software
2009-	Aaron Brown
2009-	Jennifer Fetting

Predoctoral:

2004-2011	Barry Larman (University of Maine BMMB)
2006-2014	Justin Guay (University of Maine GSBS)
2011-	Deepthi Muthukrishnan (University of Maine GSBS)
2014-	Jessica Davis-Knowlton (Tufts University Sackler)
2014-	Sarah McCarthy (University of Maine GSBS)

TEACHING EXPERIENCE:

2006-	First-year advisor for graduate students at Maine Medical Center Research Institute
2005-	Cell Biology
2006	Special Topics in Cell Biology
2009	Grantwriting for Postdocs
2009	Stem Cells and Beyond
2010	Responsible Conduct of Research: Vertebrate Animals
2011	Tissue regeneration in solid organs
2011	Responsible Conduct of Research: Vertebrate Animals
2014	American Society of Nephrology educational faculty
2014-	Advisor in International Society of Pediatric Nephrology research mentoring program for clinicians

REGULAR REVIEWER FOR FOLLOWING JOURNALS (in descending order of volume):

Development
EMBO Molecular Medicine
Nature Communications
Pediatric Nephrology
Kidney International
Proceedings of the National Academy of Sciences of the USA
Journal of the American Society for Nephrology
BMC Developmental Biology – also Associate Editor
Genes and Development
Nature

BIBLIOGRAPHY:

Refereed Articles

1. Oxburgh, L., Berg, M., Klingeborn, B., Emmoth, E. and Linné, T. (1993). Equine influenza virus from the 1991 Swedish epizootic shows major genetic and antigenic divergence from the prototype virus. *Virus Research* 28, 263-72.
2. Oxburgh, L., Berg, M., Klingeborn, B., Emmoth, E. and Linné, T. (1994). Evolution of H3N8 equine influenza virus from 1963 to 1991. *Virus Research* 34, 153-65.
3. Oxburgh, L., Åkerblom, L., Fridberger, T., Klingeborn, B. and Linné, T. (1998). Identification of two antigenically and genetically distinct lineages of H3N8 equine influenza virus in Sweden. *Epidemiology and Infection* 120, 61-70.
4. Oxburgh, L. and Hagström, A. (1999). A PCR based method for the identification of equine influenza virus from clinical samples. *Veterinary Microbiology* 67, 161-74.
5. Oxburgh, L. and Klingeborn, B. (1999). Cocirculation of two distinct lineages of equine influenza virus subtype H3N8. *Journal of Clinical Microbiology* 37, 3005-9.
6. Oxburgh, L. and Robertson, E. J. (2002). Dynamic regulation of Smad expression during mesenchyme to epithelium transition in the metanephric kidney. *Mechanisms of Development* 112, 207-11.
7. Oxburgh, L., Chu, G. C., Michael, S. K. and Robertson, E. J. (2004). TGFb superfamily signals are required for morphogenesis of the kidney mesenchyme progenitor population. *Development* 131, 4593-4605.
8. Chu, G. C, Dunn, N. R, Anderson, D. C, Oxburgh, L. and Robertson, E. J. (2004). Differential requirements for Smad4 in TGFbeta-dependent patterning of the early mouse embryo. *Development* 131, 3501-12.
9. Dunn, N. R, Vincent, S. D, Oxburgh, L. Robertson, E. J and Bikoff, E. K. (2004). Combinatorial activities of Smad2 and Smad3 regulate mesoderm formation and patterning in the mouse embryo. *Development* 131, 1717-28.
10. Oxburgh, L., Dudley, A. T., Godin, R. E., Koonce, C. H., Islam, A., Anderson, D. C., Bikoff, E. K. and Robertson, E. J. (2005). BMP4 substitutes for loss of BMP7 during kidney development. *Developmental Biology* 286, 637-646.
11. Adams, D., Larman, B. and Oxburgh, L. (2007). Developmental expression of mouse Follistatin-like 1 (Fstl1): Dynamic regulation during organogenesis of the kidney and lung. *Gene Expression Patterns* 7, 491-500.
12. Mancini, M. L, Verdi, J. M., Conley, B. A, Nicola, T., Spicer, D. B., Oxburgh, L. H. and Vary, C. P. (2007). Endoglin is required for myogenic differentiation potential of neural crest stem cells. *Developmental Biology* 308, 520-33.
13. Adams, D., Karolak, M., Robertson, E. and Oxburgh, L. (2007). Control of Kidney, eye and limb expression of *Bmp7* by an enhancer element highly conserved between species. *Developmental Biology* 15, 679-90.
14. Blank, U., Seto, M. L., Adams, D. C., Wojchowski, D. M., Karolak, M. J. and Oxburgh, L. (2008). An in vivo reporter of BMP signaling in organogenesis reveals targets in the developing kidney. *BMC Developmental Biology* 8, 86.
15. Fang, J., Menon, M., Zhang, D., Torbett, B., Oxburgh, L., Tschan, M., Houde, E. and Wojchowski, D. M. (2008). Attenuation of EPO-dependent erythroblast formation by death-associated protein kinase-2. *Blood* 112, 886-90.
16. Nikopoulos, G. N., Adams, T. L., Adams, D., Oxburgh, L., Prudovsky, I. and Verdi, J. M. (2008). The use of Endo-Porter to deliver morpholinos in kidney organ culture. *Biotechniques* 44, 547-9.
17. Mancini, M. L., Terzic, A., Conley, B. A., Oxburgh, L. H., Nicola, T. and Vary, C. P. (2009). Endoglin plays distinct roles in vascular smooth muscle cell recruitment and regulation of

arteriovenous identity during angiogenesis. *Developmental Dynamics* 238, 2479-93.
18. Nikopoulos, G. N., Martins, J. F., Adams, T. L., Karaczyn, A., Adams, D., Vary, C., Oxburgh, L. and Verdi, J. M. (2009). NRAGE: a potential rheostat during branching morphogenesis. *Mechanisms of Development* 126, 337-49.
19. Adams, D. C. and Oxburgh, L. (2009). The long-term label retaining population of the renal papilla arises through divergent regional growth of the kidney. *American Journal of Physiology. Renal Physiology* 297, F809-15.
20. Larman, B. W., Karolak, M. J., Adams, D. C. and Oxburgh, L. (2009). Chordin-like 1 and twisted gastrulation 1 regulate BMP signaling following kidney injury. *Journal of the American Society of Nephrology* 20, 1020-31.
21. Blank, U., Brown, A., Adams, D. C., Karolak, M. J. and Oxburgh, L. (2009). BMP7 promotes proliferation of nephron progenitor cells via a JNK-dependent mechanism. *Development*. 136(21): 3557-3566.
22. Adams, D. C., Karolak, M. J., Larman, B. W., Liaw, L., Nolin, J. D., Oxburgh, L. (2010). Follistatin like 1 regulates renal Il1β expression in cisplatin nephrotoxicity. *American Journal of Physiology. Renal Physiology*. (6):F1320-7.
23. Rodriguez, P., Da Silva, S., Oxburgh, L., Wang, F., Hogan, B. L. M. and Que, J. (2010). BMP signaling in the development of the mouse esophagus and forestomach. *Development*. 137(24): 4171-4176.
24. Moskowitz, I. P., Wang, J., Peterson, M. A., Pu, W. T., Mackinnon, A. C., Oxburgh, L., Chu, G. C., Sarkar, M., Berul, C., Smoot, L., Robertson, E. J., Schwartz, R., Seidman, J. G., and Seidman, C. E. (2011). Cardiac-specific transcription factor genes Smad4 and Gata4 cooperatively regulate cardiac valve development *Proceedings of the National Academy of Sciences of the United States of America*. 108(10): 4006-4011.
25. Brown, A. C., Blank, U., Adams, D. C., Karolak, M. J., Fetting, J. L., Hill, B. L., and Oxburgh, L. (2011). Isolation and culture of cells from the nephrogenic zone of the embryonic mouse kidney. *Journal of Visualized Experiments*. 22: 50.
26. Rochira, J. A., Matluk, N. N., Adams, T. L., Karaczyn, A. A., Oxburgh, L., Hess, S. T., and Verdi, J. M. (2011). A small peptide modeled after the NRAGE repeat domain inhibits XIAP-TAB1-TAK1 signaling for NF-κB activation and apoptosis in P19 cells. *PLoS One*. (7): e20659.
27. Brown, A. C., Adams, D., de Caestecker, M., Yang, X., Friesel, R., and Oxburgh, L. (2011). FGF/EGF signaling regulates renewal of early nephron progenitors during nephron development. *Development.* 138(23): 5099-5112.
28. Larman, B. W., Karolak, M. J., Lindner, V., and Oxburgh, L. (2012). Distinct bone morphogenetic proteins activate indistinguishable transcriptional responses in nephron epithelial including Notch target genes. *Cellular Signalling.* 24 (1): 257-264.
29. Chaly, Y., Marinov, A. D., Oxburgh, L., Bushnell, D. S., and Hirsch, R. (2012). Follistatin-like protein 1 promotes arthritis by enhancing inflammatory cytokine/chemokine expression. *Arthritis and Rheumatism.* 64 (4): 1082-1088.
30. Kirov, A., Duarte, M., Guay, J., Karolak, M., Yan, C., Oxburgh, L., and Prudovsky, I. (2012). Transgenic expression of nonclassically secreted FGF suppresses kidney repair. *PLoS One.* 7(5):e36485.
31. Kamiya, N., Shafer, S., Oxendine, I., Mortlock, D.P., Chandler, R.L., Oxburgh, L., and Kim, H.K. (2013). Acute BMP2 upregulation following induction of ischemic osteonecrosis in immature femoral head. *Bone*. 2013 Mar;53(1):239-47
32. Brown, A.C., Muthukrishnan, S.D., Guay, J.A., Adams, D.C., Schafer, D.A., Fetting, J.L., and Oxburgh, L. (2013). Role for compartmentalization in nephron progenitor differentiation. *Proceedings of the National Academy of Sciences of the U S A*. Mar 19;110(12):4640-5.
33. Fetting, J.L., Guay, J.A., Karolak, M.J., Iozzo, R.V., Adams, D.C., Maridas, D.E., Brown, A.C., and Oxburgh, L. (2014). FOXD1 promotes nephron progenitor differentiation by repressing

decorin in the embryonic kidney. *Development*. Jan;141(1):17-27.

34. Guay, J.A., Wojchowski, D.M., Fang, J., and Oxburgh, L. (2014). Death associated protein kinase 2 is expressed in cortical interstitial cells of the mouse kidney. *BMC Research Notes*. Jun 7;7:345
35. Lindström, N., Lawrence, M.L., Burn, S.F., Johansson, J.A., Bakker, E.R., Ridgway, R.A., Chang, C.H., Karolak, M.J., Oxburgh, L., Headon, D.J., Sansom, O.J., Smits, R., Davies, J.A., and Hohenstein, P. (2015). Integrated b-catenin, BMP, PTTEN, and Notch signaling patterns in the nephron. *Elife* 3;4;e04000.
36. Li, Y., Liu, J., Li, W., Brown, A., Baddoo, M., Li, M., Carroll, T., Oxburgh, L., Feng, Y. and Saifudeen, Z. (2015). p53 enables metabolic fitness and self-renewal of nephron progenitor cells. *Development* 1;142(7):1228-41.
37. Marks-Bluth, J., Khanna, A., Chandrakanthan, V., Thoms, J., Bee, T., Eich, C., Kang, Y., Knezevic, K., Fitch, S. Qiao, Q., Oxburgh, L., Ottersbach, K., Dzierzak, E., deBruijn, M. and Pimanda, J. (2015). SMAD1 and SMAD5 expression is co-ordinately regulated by FLI1 and GATA2 during endothelial development. *Molecular and Cellular Biology.* 15;35(12):2165-2172.
38. Brown, A.C., Muthukrishnan, S.D., and Oxburgh, L. (2015). A synthetic niche for nephron progenitor cells. *Developmental Cell*. 34:229-241.
39. Muthukrishnan, S.D., Yang, X., Friesel, R.F., and Oxburgh, L. Concurrent BMP7 and FGF9 signaling governs AP-1 function to promote self-renewal of nephron progenitor cells. *Nature Communications*. In press.

Review Articles, Invited Papers, Book Chapters and Monographs:

1. Oxburgh, L. (2009). Control of the bone morphogenetic protein 7 gene in developmental and adult life. *Current Genomics* 10, 223-230.
2. Oxburgh, L., Brown, A. C., Fetting, J., and Hill, B. (2011) BMP signaling in the nephron progenitor niche. *Pediatric Nephrology,* 26(9): 1491-1497.
3. Oxburgh, L. and de Caestecker, M. P. (2012). Ischemia-reperfusion injury of the mouse kidney. *Methods in Molecular Biology: Kidney development.* Vol. 886: 363-379.
4. Oxburgh, L., Brown, A. C., Muthukrishnan, S. D., and Fetting, J. L. (2014). Bone morphogenetic protein signaling in nephron progenitor cells. *Pediatric Nephrology*. 29(4): 531-536.
5. Yang X, Liaw L, Prudovsky I, Brooks PC, Vary C, Oxburgh L, Friesel R. (2015). Fibroblast Growth Factor Signaling in the Vasculature. *Current Atherosclerosis Reports*. 17(6):509-520
6. Oxburgh, L. (2015). The role of growth factors in balancing cap mesenchyme survival and differentiation. Kidney development, disease and regeneration. *In Kidney Development, Disease, Repair and Regeneration, Ed. M. Little. Elsevier.*