

BIOGRAPHICAL SKETCH

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NAME E. MICHELLE SOUTHARD-SMITH, PH.D	POSITION TITLE Associate Professor of Medicine and Cell & Developmental Biology		
eRA COMMONS USER NAME (credential, e.g., agency login) southaem			
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)</i>			
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	MM/YY	FIELD OF STUDY
University of Oklahoma, Norman, OK	B.S.	1983-1987	Chemistry
UT Southwestern Medical Center, Dallas, TX	Ph.D.	1987-1992	Genetics & Development
University of Michigan, Ann Arbor, MI	Post-Doc	1992-1994	Genetics
National Institutes of Health, NHGRI, Bethesda, MD	Fellow	1994-1999	Genetics & Development

A. Positions and Honors

Positions and Employment

- 1988-1992 Graduate Research Assistant, UT Southwestern Medical Center at Dallas, Mentor: Raymond J. MacDonald, Ph.D.
- 1992-1994 Cancer Biology Training Fellow, University of Michigan Comprehensive Cancer Center Principle Investigator: David T. Burke, Ph.D.
- 1994-1999 Intramural Research Training Award Fellow, National Human Genome Research Institute, NIH Principle Investigator: William J. Pavan, Ph.D.
- 1999-2008 Assistant Professor of Medicine and Cell & Developmental Biology, Vanderbilt University Medical Center.
- 2008-Pres Associate Professor of Medicine and Cell & Developmental Biology, Vanderbilt University Medical Center.

Other Experience and Professional Memberships

- 2000-Present Society of Neuroscience
- 2000-Present American Gastroenterological Association
- 2000-Present Society of Developmental Biology
- 2000-Present International Mammalian Genome Society
(IMGC Elected Nominations and Elections Committee 2007-2010)
- 2000-Present Vanderbilt Center for Molecular Neuroscience Investigator
- 2003 NIH Brain Disorders and Clinical Neurosciences V Study Section, Ad hoc Reviewer
- 2004-Present Vanderbilt Center for Human Genetics Research Investigator
- 2005-Present Vanderbilt Kennedy Center Member
- 2005 NIH Program Project Reviews NIDDK
- 2006-Present Co-Director, Gastrointestinal Development & Function Program, Vanderbilt Digestive Disease Research Center
- 2006-2011 March of Dimes Research Study Section C
- 2009 NIH Development-1 Ad Hoc Reviewer

Honors and Awards

1986	Sir Alexander Fleming Scholar, Oklahoma Medical Research Foundation
1991	NIH Training Grant in Genetics and Development, UT Southwestern Medical Center at Dallas
1992	Nominata Award, Outstanding Graduate Student, UT Southwestern Medical Center at Dallas
1993	Cancer Biology Training Fellowship, University of Michigan Comprehensive Cancer Center
1998	NIH Fellows Award for Research Excellence
1999	Howard Hughes Research Scholar Award, Department of Medicine, Vanderbilt University
2000	Research Scholar Award, Foundation for Digestive Health & Nutrition, American Gastrological Association

B. Selected Peer-reviewed Publications

- Wines, D.R., Brady, J.M., **Southard, E.M.**, and MacDonald, R.J. (1991). Evolution of the Rat Kallikrein Gene Family: Gene Conversion Leads to Functional Diversity. *J. Molec. Evol.* 32:476-492.
- Southard-Smith, M.**, Lechago, J., Wines, D.R., MacDonald, R.J., and Hammer, R.E. (1992). Tissue-specific Expression of Kallikrein Family Transgenes in Mice and Rats. *DNA and Cell Biology* 11:345-358.
- Southard-Smith, M.** and MacDonald, R.J. (1993). Isolating Reiterated Genes from a Rat Genomic Library Constructed with the Bacteriophage P1 System. *Biotech Update* 8(2):36-39.
- Southard-Smith, M.**, Pierce, J.C., and MacDonald, R.J. (1994). Physical Mapping of the Rat Tissue Kallikrein Family within Two Gene Clusters by Analysis of P1 Bacteriophage Clones. *Genomics* 22:404-417.
- MacDonald, R.J., **Southard-Smith, E.M.**, and Kroon, E. (1996). Disparate Tissue-specific Expression of the Tissue Kallikrein Multigene Family of the Rat. *J. Biol. Chem.* 271(23):13684-13690.
- Greenwood, A.D., **Southard-Smith, E.M.**, and Burke, D.T. (1997). Coordinate control and variation in X-linked gene expression among female mice. *Mammalian Genome* 8(11):818-822.
- Southard-Smith, E.M.**, Kos, L., and Pavan, W.J. (1998). *Sox10* Mutation Disrupts Neural Crest Development in *Dom* Hirschsprung Mouse Model. *Nature Genetics* 18(1):60-64.
- Southard-Smith, E.M.**, Angrist, M., Ellison, J.S., Agarwala, R., Baxevanis, A.D., Chakravarti, A., and Pavan, W.J. (1999). The *Sox10^{Dom}* Mouse: Modeling the Genetic Variation of Waardenburg-Shah (WS4) Syndrome. *Genome Research* 9(3):215-25.
- Southard-Smith, E.M.**, Collins J.E., Ellison, J.S., Smith, K.J., Baxevanis, A.D., Touchman, J, Green, E, Dunham, I, and Pavan, W.J. (1999). Comparative Analysis of the *Dominant megacolon-SOX10* Genomic Interval in Mouse and Human. *Mammalian Genome* 10(7):744-749.
- Potterf S.B., Mollaaghababa R., Hou L., **Southard-Smith E.M.**, Hornyak T.J., Arnheiter H., and Pavan W.J. (2001). Analysis of *Sox10* function in neural crest-derived melanocyte development: *Sox10*-dependent transcriptional control of dopachrome tautomerase. *Developmental Biology* 237:245-257
- Zhu L., Lee H.-O., Jordan C.S., Cantrell V.A., **Southard-Smith E.M.**, and Shin M.K. (2004). Spatio-temporal regulation of endothelin receptor-B by *Sox10* in neural crest-derived enteric neuron precursors. *Nature Genetics* 36(7):732-737.
- Cantrell V.A., Owens S.E., Chandler R.L., Airey D.C., Bradley K.M., Smith J.R., and **Southard-Smith E.M.** (2004). Interactions between *Sox10* and *EdnrB* modulate penetrance and severity of aganglionosis in the *Sox10^{Dom}* mouse model of Hirschsprung disease. *Human Molecular Genetics* 13(19):2289-301.
- Owens S.E., Broman K.W., Wiltshire T., Elmore J.B., Bradley K.M., Smith J.R., and **Southard-Smith E.M.** (2005). Genome-wide linkage identifies novel modifier loci of aganglionosis in the *Sox10^{Dom}* Model of Hirschsprung disease. *Human Molecular Genetics* 14(11):1549-58.
- Hakami R.M., Hou L., Baxter L.L., Loftus S.K., **Southard-Smith E.M.**, Incao A., Cheng J., and Pavan W.J. (2006). Genetic evidence does not support direct regulation of *EdnrB* by *Sox10* in migratory neural crest and the melanocyte lineage. *Mechanisms of Development* 123:124-134.
- Deal K.K., Cantrell V.A., Chandler R.L., Saunders T.L., Mortlock D.P., and **Southard-Smith E.M.** (2006). Distant regulatory elements in a *Sox10-βGeo* BAC transgene are required for expression in the enteric nervous system and other neural crest-derived tissues. *Developmental Dynamics* 235(5):1413-1432.

- Broman, K.W., Sen, S., Owens, S.E., Manichalkul, A., **Southard-Smith, E.M.*** and Churchill G.A. (2006) The X chromosome in quantitative trait locus mapping. *Genetics* 174(4):2151-8. *Communicating author for the data set used in this analysis.
- Chandler, K.J., Chandler R.J., Broeckelmann, E., Hou, Y., **Southard-Smith, E.M.**, and Mortlock, D.P. (2007) Relevance of BAC transgene copy number in mice: Transgene copy number variation in a large dataset and correlations with transgene integrity and expression. *Mammalian Genome* 18(10):693-708.
- Boyle, S., Misfeldt, D., Chandler, K.J., Deal K.K., **Southard-Smith, E.M.**, Mortlock, D.P., Baldwin, H.S., and de Caestecker, M. (2007) Lineage tracing the cap mesenchyme reveals distinct patterns of kidney progenitor cell fate. *Developmental Biology* 313:234-245.
- Corpening, J.C., Cantrell, V.A., Deal, K.D., and **Southard-Smith, E.M.** (2008). A Histone2BCerulean BAC transgene identifies differential expression of *Phox2b* in migrating enteric neural crest derivatives and enteric glia. *Developmental Dynamics* 237:1119-1132.
- Walters, L.C., Cantrell, V.A., Weller, K.P., Mosher, J.T., **Southard-Smith, E.M.** (2010 Revision Submitted). Effect of genetic background on enteric lineage divergence in the *Sox10^{Dom}* model of Hirschsprung disease.

C. Research Support

Ongoing Research Support

- R01 DK60047-06** (Southard-Smith) 08/01/07 – 11/30/12
NIH/NIDDK
Genetic Complexity and Modifiers of Hirschsprung Disease
Narrow intervals of modifiers initially mapped in our genome wide study and define shared haplotypes across inbred strains to facilitate modifier gene identification, define the effects of gene:gene interactions on aganglionosis, and determine signaling pathways downstream of Sox10 and its modifier Phox2b.
Role: PI
- #1-FY06-390** (Southard-Smith) 06/01/06—05/31/10
March of Dimes
Neural Crest Lineage Analysis in the Enteric Nervous System
Analysis of neuronal and glial lineage segregation and developmental potential of neural crest stem cells in the enteric nervous system using Sox10-H2BVenus and Phox2b-H2BCerulean BAC transgenic lines.
Role: PI
- R01 DK078158** (Southard-Smith) 04/15/07 – 03/31/11
NIH/NIDDK
Neural Crest Contributions to the Bladder
Identification of cell types in the bladder that arise from Sox10+ neural crest through analysis of transgene expression and Cre-LoxP implementation, determination of developmental potential, changes in lineage restriction and transcriptome profiles of sacral neural crest that contribute to the bladder and analysis of aberration in neural crest development in mouse spina bifida models with myelodysplastic bladder disease.
Role: PI
- U01 DK070219** (Southard-Smith) 04/1/05 – 03/31/11
Subcontract with Cincinnati Children's Medical Research Foundation (participation initiated 05/01/07)
Murine Atlas of Genitourinary Smooth Muscle Development
Transcriptome profiling of Sox10+ neural crest lineages in the Bladder wall at E14 and E15.
Role: PI on subcontract portion of project .
- S10 RR027661-01** (Southard-Smith) 04/15/10 – 04/14/11
NIH/NCRR
Acquisition of an Episcopic Fluorescence Image Capture System

Program Director/Principal Investigator (Last, First, Middle):

Procurement and Implementation of an Episcopic Fluorescence Image Capture System shared between four major users.

Role: PI

Completed Research Support

R01 DK64592 (Southard-Smith)

08/1/03 – 07/31/08

Subcontract with Washington University

(participation 8/1/04 – 7/31/08)

Neuronal Control of Intestinal Motility in Mutant Mice

Genetic mapping of mutants that display patterning defects in enteric neuron staining.

Role: PI on subcontract portion of project .