BIOGRAPHICAL SKETCH

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NAME	POSITION TITLE
Buffy Sue Ellsworth, Ph.D	Associate Professor of Physiology
eRA COMMONS USER NAME (credential, e.g., agency login) bellsworth	

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	MM/YY	FIELD OF STUDY
South Dakota State University, Brookings, SD	B.S.	08/95	Microbiology
South Dakota State University, Brookings, SD	B.S.	08/96	General Chemistry
South Dakota State University, Brookings, SD	M.S.	07/97	Biology
Colorado State University, Fort Collins, CO	Ph.D.	10/02	Cell and Molecular Biology
University of Michigan, Ann Arbor, MI	Postdoctoral	09/07	Human Genetics

A. Personal Statement

Our long-term goal is to identify the genes that, when mutated, cause pituitary hormone insufficiency and identify the mechanism of action of those genes. To expand the molecular diagnoses for pituitary hormone insufficiency, we have focused on a family of transcription factors referred to as forkhead factors. Forkhead factors are essential for diverse developmental processes and mutations in the genes encoding these factors are responsible for a number of human developmental disorders. Specifically, we investigate the contribution of forkhead factors to pituitary development. During my doctoral training, I showed that the forkhead factor, FOXL2, is part of a transcriptional complex that binds the gonadotropin-releasing hormone receptor gene, which is expressed in gonadotrope cells. As a postdoctoral fellow at the University of Michigan Medical School, I performed developmental mouse studies to demonstrate that FOXL2 protein is present in the prospective anterior lobe of the developing pituitary gland beginning at e11.5 and continuing through adulthood in gonadotrope and thyrotrope cells. I found that FOXL2 stimulates expression of the α-subunit gene in cell culture studies and by over-expression of *Foxl2* in transgenic mice. In my current position as associate professor at Southern Illinois University, I organized a research team, which demonstrated that the forkhead factor, *Foxp3*, is required for normal gonadotrope function and that *Foxp3* mice exhibit hypothyroidism. We have also shown that loss of *Foxd1* causes reduced *Lhb* expression and increased pituitary cell proliferation. Finally, we investigated the expression patterns of FOXO1 during pituitary development and in the adult. We found that FOXO1 is present in the nucleus of pituitary cells starting at e14.5 and is present in an increased number of cells in *p27* null embryos, suggesting an intriguing negative feedback mechanism. Furthermore, our studies show that mice in which we have excised the *Foxo1* gene from the pituitary gland early in development using a *Foxg1*-cre mouse ($Foxo1^{\Delta pit}$) exhibit a drastic reduction in the number of GH-immunoreactive cells at e16.5 and e18.5, suggesting that FOXO1 is important for somatotrope specification/function. My expertise in both forkhead transcription factor function and pituitary development places me in a unique situation to address the roles of forkhead factors in pituitary development.

B. Positions and Honors

Positions and Employment

1993-1995 Undergraduate Researcher, Microbiology, South Dakota State University
1995-1997 Graduate Research Assistant, Biology, South Dakota State University
1997-2002 Doctoral Candidate, Cell and Molecular Biology, Colorado State University
2002-2007 Postdoctoral Fellow, Human Genetics, University of Michigan Medical School
2007-2013 Assistant Professor, Physiology, Southern Illinois University School of Medicine, Carbondale
2013-present Associate Professor, Physiology, Southern Illinois University School of Medicine, Carbondale

Other Experience and Professional Memberships

1999-present	Member, Endocrine Society
2002	**Embryonic Stem (ES) Cell Training** – Two week course, University of Michigan Transgenic Animal Model Core. General care and maintenance of ES cells for the purpose of gene targeting.
2003	**Developmental Biology Gordon Conference**
2004	**Mouse Embryo Microinjection Training** – One week course, University of Michigan Transgenic Animal Model Core. Egg collection, microinjection of DNA into 1-cell fertilized eggs, and transfer of 1-2 cell embryos into pseudopregnant female mice.
2004-5, 11-13	Member, Society for the Study of Reproduction
2005	**NIH/NICHD Postdoctoral Fellows' Career Workshop**
2009-2012	Women in Endocrinology, Communications Committee
2012-2014	Women in Endocrinology, Communications Committee, Chair
2008	Ad hoc reviewer for Developmental Biology
2009	Ad hoc reviewer for Development
2009	Ad hoc reviewer for Federation of American Societies for Experimental Biology Journal
2010	Ad hoc reviewer for Biology of Reproduction
2010	Ad hoc reviewer for Molecular Endocrinology
2011	Ad hoc reviewer for Human Genetics
2011-13	Biology of Reproduction, Editorial Board
2012-13	Frontiers in Genomic Endocrinology, Editorial Board
2011	Chair of Endocrine Society Symposium, "New Aspects of Signaling & Secretion in the Gonadotrope"
2012	Society for the Study of Reproduction, Program Committee, Module Session co-chair: Reproductive Endocrinology
2013	Chair of Endocrine Society Symposium, "Neuroendocrinology and Pituitary - Basic"

Honors

1994	EPSCoR ADP Summer Research Stipend for Undergraduate Women and Minority Students
1996	Third Place in Raymond A. Moore Biostress Research Poster Contest
1996	Inducted into Gamma Sigma Delta -- The Honor Society of Agriculture
1997	Semi-Finalist in the SDSU Chapter of the Society of Sigma Xi 1997 Research Paper Award
1999	Colorado State University Graduate Program in Cell and Molecular Biology Annual Symposium Poster Contest Winner
2000	Travel Award from Women in Endocrinology
2000	Travel Award from Neuroendocrinology
1997-2000	USDA Biotechnology Training Grant
2001	Endocrine Society Travel Grant Award
2003	RSP Postdoctoral Fellowship, NIH T32 Training Grant
2004-2006	Ruth L. Kirschstein National Research Service Award (NRSA), NIH: National Institute of Child Health & Human Development
2008	McNair Scholar Program Outstanding Mentor
2008	SIUC Office of Research Development and Administration Faculty Seed Grant
2009	SIU Central Research Committee Starter Grant
2012	Invited talk: The Society for the Study of Reproduction Ann. Mtg. State College, PA. The Forkhead Transcription Factor, *Foxp3*, is Required for Normal Pituitary Function. Session: The Foxy Pituitary: Emerging Roles for Forkhead Transcription Factors in Gonadotrope Development and Function.
2012	SIU School of Medicine Excellence in Academic Medicine Award
2013	Invited talk: The Endocrine Society Ann. Mtg. San Francisco, CA. Forkhead Transcription Factors in Pituitary Development. Session: The Secret Lives of Gonadotropes.
2013	SIU School of Medicine Near Miss Award

2013 Invited talk: 7th Ann. Pituitary-Hypothalamus Mtg. Gull Lake, MI. FOXO1 in Pituitary Development and Function. Session: Transcriptional Regulation.

C. Publications

*Authors contributed equally to this publication.

1. Duval DL, **Ellsworth BS**, Clay CM 1999 Is gonadotrope expression of the gonadotropin-releasing hormone receptor gene mediated by autocrine/paracrine stimulation of an activin response element? Endocrinology 140:1949-1952.
2. **Ellsworth BS**, Burns AT, Escudero KW, Duval DL, Nelson SE, Clay CM 2003 The gonadotropin releasing hormone (GnRH) receptor activating sequence (GRAS) is a composite regulatory element that interacts with multiple classes of transcription factors including Smads, AP-1 and a forkhead DNA binding protein. Mol Cell Endocrinol 206:93-111.
3. ***Ellsworth BS**, *White BR, Burns AT, Cherrington BD, Otis AM, Clay CM 2003 c-Jun N-terminal kinase (JNK) activation of AP-1 underlies homologous regulation of the gonadotropin-releasing hormone receptor gene in αT3-1 cells. Endocrinology 144:839-849.
4. **Ellsworth BS**, Egashira N, Haller J, Butts DL, Cocquet J, Clay CM, Osamura RY, Camper SA. 2006 FOXL2 in the Pituitary: Genetic, Molecular and Developmental Analysis. Mol Endocrinol 20:2796-805.
5. Hertzano R, Dror A, Montcouquiol M, Ahmed Z, **Ellsworth B**, Camper S, Friedman TB, Kelley MW, Avraham K. 2007 *Lhx3*, a LIM domain transcription factor, is regulated by POU4F3 in the auditory, but not in the vestibular system. Eur J Neurosci 25:999-1005.
6. Tian G, Singh U, Yu Y, **Ellsworth BS**, Hemberger M, Geyer R, Stewart MD, Behringer RR, Fundele R. 2008 Expression and function of the LIM homeobox containing genes *Lhx3* and *Lhx4* in the mouse placenta. Dev Dyn, 237:1517-25.
7. ***Ellsworth BS**, *Butts DL, Camper SA. 2008 Mechanisms Underlying Pituitary Hypoplasia and Dorsalization of Pre-gonadotropes in *Lhx3* Deficient Mice. Dev Biol 313:118-29. PMCID: PMC2768753
8. Davis SW, Castinetti F, Carvalho LR, **Ellsworth BS**, Potok MA, Lyons RH, Brinkmeier ML, Raetzman LT, Carninci P, Mortensen AH, Hayashizaki Y, Arnhold IJ, Mendonca BB, Brue T, Camper SA. 2010 Molecular Mechanisms of pituitary organogenesis: In search of novel regulatory genes. Mol Cell Endocrinol, 323:4-19. PMCID: PMC2909473
9. Carvalho LR, Brinkmeier ML, Castinetti F, **Ellsworth BS**, Camper SA. 2010 Corepressors TLE1 and TLE3 Interact with HESX1 and PROP1. Mol Endocrinol, 24:754-65. PMCID: PMC2852357
10. Yang WH, Gutierrez N, Wang L, **Ellsworth BS**, Wang CM. 2010 Synergistic Activation of the Mc2r Promoter by FOXL2 and NR5A1 in Mice. Biol Reprod, 83:842.
11. Jung DO, Jasurda JS, Egashira N, **Ellsworth BS**. 2012 The Forkhead Transcription Factor, FOXP3, Is Required for Normal Pituitary Gonadotropin Expression in Mice. Biol Reprod, 86:144. PMCID: PMC3364925
12. Gumbel JH, Patterson EM, Owusu SA, Kabat BE, Jung DO, Simmons J, Hopkins T, **Ellsworth BS**. 2012 The Forkhead Transcription Factor, *Foxd1*, is Necessary for Pituitary Luteinizing Hormone Expression in Mice. PLoS ONE, 7:e52156. PMCID: PMC3526578
13. Majumdar S, Farris CL, Kabat BE, Jung DO, **Ellsworth BS**. 2012 Forkhead Box O1 is Increased in Embryonic Pituitary in the Absence of $p27^{Kip1}$. PLoS ONE, 7:e52136. PMCID: PMC3522653
14. Tran S, Zhou X, Lafleur C, Calderon MJ, **Ellsworth BS**, Kimmins S, Boehm U, Treier M, Boerboom D, Bernard DJ. 2013 Impaired Fertility and FSH Synthesis in Gonadotrope-Specific *Foxl2* Knockout Mice. Mol Endocrinol, 27:407. PMCID: PMC3589670
15. **Ellsworth BS**. 2013 Obesity: A Somatotrope Perspective. Endocrinology, 154:1390.

16. Davis SW, **Ellsworth BS**, Perez Millan MI, Gergics P, Schade V, Foyouzi N, Brinkmeier ML, Mortensen AH, Camper SA. 2013 Pituitary gland development and disease: from stem cell to hormone production. Curr Top Dev Biol, 106:1-47. PMCID: PMC4007265

17. Jasurda JS, Jung DO, Froeter ED, Schwartz DB, Hopkins TD, Farris CL, McGee S, Narayan P, **Ellsworth BS**. 2014 The Forkhead Transcription Factor, FOXP3: A Critical Role in Male Fertility. Biol Reprod, 90:4, 1-8. PMCID: PMC4076402

18. Calderon MJ, Ploegman AG, Bailey B, Jung DO, Navratil AM, **Ellsworth BS**. 2015 Loss of *Foxm1* Results in Reduced Somatotrope Cell Number During Mouse Embryogenesis. PLoS ONE, 10:e0128942. PMCID: PMC4468165

19. Stallings CE, Kapali J, **Ellsworth BS**. 2016 Mouse Models of Gonadotrope Development. Prog Mol Biol Transl Sci, 143:1-48.

20. **Ellsworth bs**. 2016 Pituitary Regeneration: It'll Knock Your SOX Off! Endocrinology, 157:452-4.

21. Kapali J, Kabat BE, Schmidt KL, Stallings CE, Tippy M, Jung DO, Edwards BS, Nantie LB, Raetzman LT, Navratil AM, **Ellsworth BS**. 2016 *Foxo1* is Required for Normal Somatotrope Differentiation. *Endocrinology*, 157:4351.

D. Research Support:

Current Research Support

R15 HD078885-01 Ellsworth (PI) 09/20/14-6/30/18
NIH/NICHD
The Mechanism by Which FOXO1 Regulates Somatotrope Differentiation and/or Function
The objective of this grant is to investigate the molecular mechanisms underlying FOXO1's role in temporal regulation of somatotrope differentiation.
Role: PI

Southern Illinois University School of Medicine Ellsworth (PI) 01/01/17-12/31/17
Identification of Somatotrope Proteins within the FOXO1 Transcriptional Complex
Discover Science Grant: The objective of this grant is to identify FOXO1 binding partners by rapid immunoprecipitation mass spectrometry of endogenous proteins (RIME).
Role: PI

Completed Research Support

Southern Illinois University School of Medicine Ellsworth (PI) 05/16/08 – 06/30/09
The Role of Forkhead Transcription Factors in Pituitary Development and Function
ORDA Faculty Seed Grant: The objective of this grant is to generate preliminary data that can be used to apply for external funding.
Role: PI

Southern Illinois University School of Medicine Ellsworth (PI) 07/01/09 – 06/30/10
The Role of the Forkhead Transcription Factors, FOXO1 and FOXM1, in Pituitary Gland Development
Central Research Committee Award: The objective of this grant is to generate preliminary data that can be used to obtain external funding for the study of FOXO1 and FOXM1 in pituitary development.
Role: PI

R15 HD063469-01 Ellsworth (PI) 07/01/10 – 06/30/13
The Forkhead Transcription Factor, FOXO1, and its Role in Pituitary Gland Development
The major goals of this project are to define the role of the transcription factor, FOXO1, during pituitary gland development.
Role: PI

Southern Illinois University School of Medicine Ellsworth (PI) 03/1/2012 – 02/28/2013
The Role of the Forkhead Transcription Factor, FOXG1, in Pituitary Development
Excellence in Academic Medicine Award: The major goal of this project is to investigate the contribution of FOXG1 to pituitary gland development.
Role: PI

Southern Illinois University School of Medicine Ellsworth (PI) 11/01/2013-06/30/2014
Mechanism by Which FOXO1 Regulates Somatotrope Differentiation and/or Function.
Near-Miss Award: The major goal of this project is to obtain preliminary data for an NIH grant application.
Role: PI