

# ASHLEY WINN SEIFERT

## *Curriculum Vitae*

Department of Biology  
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### ACADEMIC APPOINTMENTS

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2013-Present	Assistant Professor, University of Kentucky, Dept. of Biology
2010-Present	Visiting Professor, University of Nairobi, Department of Veterinary Anatomy and Physiology

### EDUCATION

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2009-2013	Post-doctoral Fellow, <b>University of Florida</b> , Department of Biology Mentor: Malcolm Maden, Ph.D.
2004-2009	<b>University of Florida</b> , Department of Zoology Ph.D., Developmental Biology, Advisor: Martin J. Cohn, Ph.D.
2008	SDB Short Course: <i>Frontiers in Developmental Biology: Concepts, Techniques and Model Organisms</i> .
2001-2004	<b>University of Florida</b> , Department of Zoology M.Sc., Physiological Ecology, Advisor: Lauren J. Chapman, Ph.D.
1994-1998	<b>Bowdoin College</b> A.B., Biology; minor in Philosophy, concentration in Photography

### PUBLICATIONS

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#### Peer-reviewed Articles and Reviews (\*denotes equal contribution)

- Haughton, C.L., Gawriluk, T.R., and **Seifert, A.W.** (2015). The African spiny mouse (*Acomys cahirinus*): biology and husbandry of a laboratory colony. *JAALAS*. *In press*.
- Gredler, M. L., **Seifert, A. W.**, and Cohn, M. J. (2015). Tissue-specific roles of Fgfr2 in development of the external genitalia. *Development* 142 (12), 2203-2212.
- Maden, M., Avila, D., Roy, M., and **Seifert, A.W.** (2015). Tissue specific reactions to positional discontinuities in the regenerating axolotl limb. *Regeneration*. DOI: 10.1002/reg2.35
- Gredler, M. L., **Seifert, A. W.**, and Cohn, M. J. (2014). Phallus and cloaca development in the American alligator, *Alligator mississippiensis*. *Journal of Sexual Development*, 9:53-67
- Seifert, A.W.**, and Maden, M. (2014). New insights into skin regeneration. *International Review of Cell and Molecular Biology*. 310, 129-169.
- Monaghan, J. R.\*, Stier, A.C.\*, Michonneau, F.\*, Smith, M.D.\*, Pasch, B.\*, Maden, M and **Seifert, A. W. \*** (2014). Experimentally induced metamorphosis in axolotls reduces regenerative rate and fidelity. *Regeneration*. 1: 1, 2-14

- Seifert, A.W.**, and Voss, S.R. (2013). *Commentary: Revisiting the relationship between regenerative ability and aging. BMC Biology*, **11**:2
- Seifert, A.W.**, Kiama, S.G., Seifert, M.G., Goheen J., Palmer, T. M., and Maden, M. (2012). Skin shedding and tissue regeneration in African spiny mice (*Acomys*). *Nature*, Sep 27; 489(7417):561-5.
- Monaghan, J. R., Athipposhy, A., **Seifert, A.W.**, Putta, S., Stromberg, A., Maden, M., Gardiner, D. M., and Voss, S. R. (2012). Denervation quantitatively and systemically alters transcription within the wound epithelium of a regeneration-competent salamander limb. *Biology Open*, Oct 15;1(10):937-48.
- Seifert, A.W.**, Monaghan, J.R., Voss, S.R., and Maden, M. (2012). Skin regeneration in adult axolotls: A blueprint for scar-free healing in vertebrates. *PLoSOne* 7(4):e32875. Epub, Apr 2
- Seifert, A. W.**, Monaghan, J.R., Smith, M.D., Pasch, B., Stier, A.C., Michonneau, F., and Maden, M. (2012). The influence of fundamental traits on mechanisms controlling appendage regeneration *Biological Reviews of the Cambridge Philosophical Society*. May; 87(2):330-45, Epub 2011, Sep 19.
- Seifert, A.W.\***, Zheng, Z\*, Ormerod, B.K., and Cohn, M.J. (2010). *Shh* controls growth of external genitalia by regulating cell cycle kinetics. *Nature Communications* 1(3):1-9.
- Seifert, A.W.**, Bouldin, C., Choi, K.S., Harfe, B.H., and Cohn, M.J., (2009). Multiphasic and tissue specific roles for *Shh* during anogenital development. *Development* 136 (23):3949-57
- Seifert, A.W.**, Yamaguchi, T., and Cohn, M.J. (2009). Functional and phylogenetic analysis shows that *Fgf8* is a marker of genital induction in mammals but is not required for external genital development. *Development* 136(15):2643-51.
- Seifert, A.W.**, Harfe, B.H., and Cohn, M.J. (2008). Cell lineage analysis demonstrates an endodermal origin of the distal urethra and perineum. *Developmental Biology* 1;318(1):143-52. (cover article)
- Seifert, A.W.**, and Chapman, L.J. (2007). The relationship between temperature and standard rate of metabolism in the African lungfish *Protopterus aethiopicus*, from Uganda. *African Journal of Aquatic Sciences*, 32(3) 299-303.
- Garner, S., Birt, T.P., Mlewa, C.M., Green, J.M., **Seifert, A.**, and Friesen, V.L. (2006). Genetic variation in the marbled lungfish *Protopterus aethiopicus* in Lake Victoria and introduction to Lake Baringo, Kenya. *Journal of Fish Biology*, 69: 189-199.
- Seifert, A.W.**, and Chapman, L.J. (2006). Respiratory allocation and standard rate of metabolism in the African lungfish, *Protopterus aethiopicus*. *Comparative Biochemistry and Physiology: Molecular and Integrative Physiology*, 143(1):142-8.
- Chapman, L.J., Nordlie, F.G., and **Seifert, A.** (2002). Respiratory oxygen consumption among groups of the African cichlid *Pseudocrenilabrus multicolor victoriae* subjected to different oxygen concentrations during development. *Journal of Fish Biology*, 61: 242-251.

#### Articles – in review

Gawriluk, T. R., Simkin, J., Thompson, K.L., Biswas, S., Clare-Salzler, Z., Kimani, J.M., Kiama, S.G., Ezenwa V.O., Smith, J.J., and Seifert, A.W. *Comparative analysis of ear hole closure identifies epimorphic regeneration as a discrete trait in mammals* (in revision)

#### Book Chapters, Edited Volumes, Technical Reports

Coots, P., and **Seifert, A.W.** (2015). Thyroxine induced metamorphosis in the axolotl (*Ambystoma mexicanum*). In, *Salamanders in Regeneration Research* in Methods in Molecular Biology, eds. Kumar, A. and Simon, A. Springer. USA. pp. 141-145.

Ankerson, T.T., Fernandez, S., M., **Seifert, A.W.**, and Velez, M.V. (2003). The gopher tortoise and upland habitat protection in Florida: Legal and policy considerations. In, Report on protected species and habitat protection, Ankerson, T.T., Fernandez, S.M., and Seifert, A.W. (eds). Report available through UF Levin College of Law library.

#### **GRANTS, FELLOWSHIPS AND INDUSTRY FUNDING**

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2015-2018	NextGen Biologics Inc. ( <b>PI</b> ) (\$291,616) - <i>Developing an amphibian sourced surgical mesh</i>
2015	Igniting Research Collaboration, University of Kentucky ( <b>Co-PI</b> ) (\$20,000) - Sphingolipids and delayed wound healing in diabetes.
2015	National Geographic Grants in Aid of Research (NGS) ( <b>PI</b> ) (\$20,961) - <i>Innate immunity and regeneration in East African rodents</i>
2014-2018	NSF, Division of Integrated Organismal Systems (IOS) and Office of International Science and Engineering (ISE). ( <b>PI</b> ) (\$750,000) – <i>Immune tradeoffs during tissue regeneration in mammals</i>
2012-2013	SEED Biotechnologies Corporation. ( <b>PI</b> ) (research funds) (\$45,000) – funding for technician and research into scar-free healing in axolotls
2012 (spring)	SEED Biotechnologies Corporation. ( <b>PI</b> ) (research funds) (\$12,000) – for continued study exploring skin regeneration in salamanders towards developing regenerative therapies in humans
2009-2013	NIH NIDDK Postdoctoral Fellowship in Regenerative Medicine NIH T32DK074367
2009-2013	Singer Biology Fund Award. (\$15,000) ( <b>Co-PI</b> ) – Effects of body size, age and metamorphosis on regenerative ability in <i>Ambystoma mexicanum</i> (axolotl).
2008	Department of Zoology Research Grant. (\$500) – Genetic control of external genital development in mammals.
2008	HHMI GATOR Research Award. (\$500) – Fibroblast growth factor expression during external genital development.
2001-2004	Grinter Fellowship. (\$7000) – Graduate fellowship awarded by University of Florida to cover summer research expenses.

2003	National Science Foundation GRF (Honorable mention)
2002	Raney Fund, ASIH. (\$1000) – Metabolism across ontogeny in the African lungfish, <i>Protopterus aethiopicus</i> .
2002	Sigma Xi Grants in Aid of Research. (\$500) -- Energetics of the African lungfish, <i>Protopterus aethiopicus</i>

### **GRANTS UNDER REVIEW**

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2016-2021	R01 NIH, NIAMS, Macrophage phenotype orchestrates tissue regeneration in mammals (PI)
2015-2018	HFSP, Cellular and molecular regulation of complex tissue regeneration in mammals (PI)

### **AWARDS**

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2011	Southeast Society for Developmental Biology Meeting -- Best Talk – awarded travel to SDB main meeting
2008	Society for Developmental Biology -- Best Poster, SDB Short Course (Runner-Up)

### **TEACHING**

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2015	BIO 425: Animal Development and Regeneration
2015-2016	UKC 300/A&S 500 BioArt: Creativity, Experimentation and Methodology in Art and Science
2014	BIO 197 StemCats (Faculty Participant)
2014- (every fall)	BIO 770 Principles of Regeneration
2014	BIO 770 Topics in regeneration biology
2014	BIO 580 Stem cells, tissue engineering and regenerative medicine (Co-Instructor)
2012	Seminar in Regeneration Biology (instructor)
2011	Integrative Principles (guest lecturer)
2011-2013	Biology for Non-majors (guest lecturer)
2010-2011	Evolution of Regenerative Mechanisms (co-instructor)
2008-2010	Reproductive Biology (guest lecturer)
2009	Seminar in The Cell Cycle and Development (instructor)
2007-2008	Howard Hughes Mentor
2004-2005	Developmental Biology (teaching assistant)
2004-2005	Genes, Embryos and Evolution (teaching assistant)
2001-2004	Functional Vertebrate Anatomy (laboratory instructor)

### **MENTORING**

#### **Postdoctoral Students**

Tom Gawriluk (2014-present). Department of Biology, University of Kentucky (Mentor)  
 Jennifer Simkin (2015-present). Department of Biology, University of Kentucky (Mentor)

#### ***Current***

#### **Graduate Students**

John Kimani (2014-present). Ph.D Candidate. Department of Veterinary Anatomy and Physiology, University of Nairobi (Committee Member)

Sruthi Purushothaman (2014-present). Ph.D Candidate. Department of Biology, University of Kentucky (Advisor)

Shishir Biswas (2014-present). Ph.D Candidate. Department of Biology, University of Kentucky (Advisor)

Adam Cook (2013-present). M.Sc Candidate. Department of Biology, University of Kentucky (Advisor).

Peggy Coots (2013-present). MFA Candidate, Department of Fine Arts, University of Kentucky (Committee Member).

Stephanie Bryant (2014-present). Ph.D. Candidate. Department of Biology, University of Kentucky (Committee Member).

Luc Dunoyer (2013-present). Ph.D. Candidate. Department of Biology, University of Kentucky (Committee Member).

Brandon Franklin (2013-present). Ph.D. Student. Department of Biology, University of Kentucky (Committee Member).

Nour Al Haj Baddar (2015-present). Ph.D. Candidate. Department of Biology, University of Kentucky (Committee Member).

### **Completed**

John Kimani (2010-2013). M.Sc. Department of Veterinary Anatomy and Physiology, University of Nairobi. *Wound healing and regeneration in the naked mole rat, Heterocephalus glaber*. (Co-Advisor).

Tom Gawriluk (2013-2014). Ph.D. Candidate. Department of Biology, University of Kentucky. *Targeted knockout of Beclin-1 reveals an essential function in ovary and testis*. (Committee Member).

### **Undergraduate Students**

#### **Current**

Bailey Gensheimer (2015-present). Effect if stress induced glucocorticoids on tissue regeneration.

Malik Guidry (2014-present). Molecular basis of pattern formation. NSF REU student

Juliana Lavey (2014-present). Molecular basis of pattern formation.

Douglas Shaw (2013-present). Skin microbiome axolotls. (BIO 395 student)

Corin Hacker (2015-present). Cartilage regeneration in African spiny mice.

#### **Completed (\*indicates publication with student)**

Zara Ashraf (2013-2015). Blastema formation during spiny mouse ear hole regeneration. (BIO 395 student)

Gavin Hall (2013-2014). Wnt/ $\beta$ -catenin signaling during skin development and regeneration in axolotls.

Oliver Olivarez (2012-2013). Role of ECM during skin regeneration in salamanders.

Kirabet Quintana-Ramos (2012, summer). MMP function during skin regeneration in metamorphic axolotls.

\*Daima Avila (2012-2013). Ear hole regeneration in mammals.

Adam Cook (2012-2013). Evolution of regenerative mechanisms in Urodeles. (Graduate student in Biology, UK).

Natalie Nelson (2011-2012). Skin development in *Ambystoma mexicanum*.

Joshua Hochberger (2010-2012). Identifying developmental mechanisms regulating wound healing and regeneration in Anurans.

Conner Burnside (2010-present). Developmental biology of the integument in *Ambystoma mexicanum*

Sean Connelly (2010-2012). The effects of functional traits on regenerative ability in *Ambystoma mexicanum*

- McKayla Spencer (2010-2011). The effects of functional traits on regenerative ability in *Ambystoma mexicanum*
- Jenny Fernandez (2008-2009). OPT imaging of the murine external genitalia.
- Liz Dantzler (2008-2009). Fgf signaling during sexual differentiation of the external genitalia. (*publication in prep, see above*).
- Rickesh Patel. (2007-2009). *Howard Hughes Mentoring Program*. Development and cellular origin of the mammalian vagina.
- \*Marissa Gredler (2007-2008). Functional analysis of *FgfR2* in the genital tubercle.
- Stacey Gray. (2007). *Howard Hughes Mentoring Program*. *Foxa1* and *Foxa2* regulation of perineum formation.
- Christina Varvarikos. (2006-2007). *Howard Hughes Mentoring Program*. Fgf signaling during genital development.
- Virginia Hoglund (2005). Histological analysis of the developing mouse genital tubercle.
- Eric Rubin (2005-2007). Androgen signaling during mammalian urethrogenesis.
- Sarah Tanaka (2003). Analysis of Q<sub>10</sub> measures in an air-breathing fish, *Protopterus aethiopicus*
- Michael Wasserman (2002). Aestivation in the lungfish, *Protopterus aethiopicus*.

## ORAL PRESENTATIONS

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- 2016 Invited Speaker: *TBD*, Stem Cell Society Singapore (SCSS), Symposium 2016: Modeling Cell Fate and Development, Biopolis, Singapore
- 2016 Invited Speaker: *TBD*, Pasteur Institute, Department of Developmental and Stem Cell Biology, Paris, France
- 2015 Invited Speaker: *TBD*, Wakeman Institute, Rutgers University, Departmental Seminar Series, Piscataway, NJ
- 2015 Invited Speaker: *Integrating art and biology: in the classroom, the laboratory and beyond*. George Church Laboratory, Department of Genetics, Harvard University, Cambridge, MA
- 2015 Invited Speaker: *Epimorphic regeneration in African spiny mice*, Harvard Department of Stem Cell and Regenerative Medicine, Cambridge, MA
- 2015 Invited Speaker: *Comparative biology of vertebrate regeneration*, MDI Biological Laboratory, Symposium: Comparative Biology of Tissue Repair, Regeneration and Aging, Salisbury Cove, ME
- 2015 Invited Speaker: *Regeneration: From Axolotls to Acomys*, Department of Genetics, Cell Biology and Development, University of Minnesota, Minneapolis, MN
- 2015 Invited Speaker: *Comparative biology of vertebrate regeneration*, Department of Biomedical Engineering, University of Kentucky, Lexington, KY
- 2015 Invited Speaker: *Complex tissue regeneration in African spiny mice*, Department of Craniofacial and Mesenchymal Biology, UCSF, San Francisco, CA
- 2014 Invited Speaker: *New insights into mammalian skin regeneration* Department of Cell and Molecular Biology, Tulane University, New Orleans, LA
- 2014 Invited Speaker: *Understanding limitations on vertebrate organ regeneration*. CDB Symposium, RIKEN: Regeneration of Organs: Programming and Self-Organization, Kobe, Japan
- 2012 Invited Speaker: *Weak skin, spiny hairs and regeneration in African spiny mice (Acomys)*. Department of Biology, Texas Tech University.
- 2012 Invited Speaker: *Skin shedding and tissue regeneration in African spiny mice (Acomys)*. Keystone Meeting; Mechanisms of Whole Organ Regeneration, Breckenridge, CO.
- 2011 Invited Speaker: *Perfect Skin Regeneration: New Models for Scar-Free Healing*. Department of Biomedical Sciences, Cornell University.

- 2011 Selected Speaker: *Skin regeneration in adult axolotls: A blueprint for scar-free healing in vertebrates*. Southeast Society for Developmental Biology, University of Florida.
- 2010 Invited Speaker: *Development of the anogenital system in mammals*. University of Nairobi, Department of Veterinary Anatomy and Physiology.
- 2009 Selected Speaker: *Origin of the penile urethra and the proximodistal fate of the urethral epithelium*. Society for Developmental Biology, Cancun Mexico.
- 2004 Selected Speaker: *Respiratory allocation and the standard rate of metabolism in the African lungfish, *Protopterus aethiopicus**. Society for Experimental Biology main meeting, Edinburgh, Scotland.
- 2003 Invited Speaker: *The gopher tortoise and upland habitat protection in Florida: Legal and policy considerations*. Protected Species and Upland Habitat Workshop, UF Levin College of Law, Gainesville, Florida.

#### UNIV. OF KENTUCKY PRESENTATIONS

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- 2014 Research in Animal Regeneration: STEMCATS Chat, University of Kentucky
- 2013 Models in Regeneration Biology, Dean's Circle, University of Kentucky

#### POSTER PRESENTATIONS

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- 2015 Simkin, J.S., Gawriluk T., Biswas S., Gensel J.C., and Seifert A.W. *Macrophage phenotype reveals fundamental differences between regeneration and scarring*. MDI Biological Laboratory, Symposium: Comparative Biology of Tissue Repair, Regeneration and Aging, Salisbury Cove, ME
- 2015 Cook, A.B., and Seifert, A.W. *Beryllium nitrate reveals fibroblast migration as an essential component of skin and limb regeneration in axolotls*. MDI Biological Laboratory, Symposium: Comparative Biology of Tissue Repair, Regeneration and Aging, Salisbury Cove, ME
- 2010 Seifert, A.W., Monaghan, J., and Maden, M. Skin regeneration in the Mexican axolotl (*Ambystoma mexicanum*). Florida Genetics, Gainesville, Florida.
- 2010 Seifert, A.W., Monaghan, J., and Maden, M. Skin regeneration in the Mexican axolotl (*Ambystoma mexicanum*). EMBO Meeting; Molecular and cellular basis of tissue repair and regeneration, Sesimbra, Portugal.
- 2010 Monaghan, J., Seifert, A.W., and Maden, M. Nerve-dependent gene expression in the epidermis of regenerating salamander limbs. EMBO Meeting; Molecular and cellular basis of tissue repair and regeneration, Sesimbra, Portugal.
- 2009 Seifert, A.W., Ormerod, B.K., and Cohn, M.J. *Sonic hedgehog* regulates cell cycle kinetics during morphogenesis. Society for Developmental Biology 68<sup>th</sup> Annual Meeting, San Francisco, California.
- 2009 Seifert, A.W., Yamaguchi, T., and Cohn, M.J. Functional and phylogenetic role of *Fgf8* during external genital development. Society for Developmental Biology 68<sup>th</sup> Annual Meeting, San Francisco, California.
- 2008 Seifert, A.W., Ormerod, B.K., and Cohn, M.J. *Sonic hedgehog* regulates cell cycle kinetics during morphogenesis. Latin American Society for Developmental Biology, Buenos Aires, Argentina.
- 2007 Seifert, A.W., Harfe, B, and Cohn, M.J. Multiphasic role of *Shh* during external genital development and cloacal septation. Gordon Research Conference; Developmental Biology, New London, New Hampshire.
- 2007 Seifert, A.W., Harfe, B, and Cohn, M.J. Multiphasic role of *Shh* during external genital development and cloacal septation. Society for Developmental Biology 66<sup>th</sup> Annual Meeting, Cancun, Mexico.

2006 Seifert, A.W., Harfe, B, and Cohn, M.J. Origin of the penile urethra and the proximodistal fate of the urethral epithelium. Society for Developmental Biology 65<sup>th</sup> Annual Meeting, Ann Arbor, Michigan.

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### **CONSULTING POSITIONS**

2015-present	Consultant, NeXtGen Biologics, Inc.
2011-present	Consultant, ISE Professional Testing and Consulting Services, Inc.
2010-2014	Scientific Advisory Board, Regenerative Medicine International

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### **PROFESSIONAL AFFILIATIONS**

Society for Developmental Biology

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### **SERVICE**

2014-2015	National Science Foundation (NSF) Reviewer
2013-2015	Univ. of Kentucky Graduate Affairs Committee (GAC)
2015	Univ. of Kentucky Faculty Search Committee (Int. Physiologist Faculty Hire)
2013	Univ. of Kentucky Faculty Search Committee (Dev. Biol. Faculty Hire)
2011-2013	Univ. of Florida Postdoctoral Affairs Advisory Committee
2012-2013	Postdoctoral Mentoring Program
2005	Dept. of Biology, Faculty Search Committee (Evolutionary Functional Morphology)
2004	Graduate Curriculum Committee
2007-2008	Vice President, Zoology Graduate Student Association

### **Granting Agencies – Ad Hoc Reviewer**

National Geographic Society, Department of Defense (ARO), National Science Foundation (NSF), Swiss National Science Foundation (SNF)

### **Academic Journals – Ad Hoc Reviewer**

Science Reports, Developmental Cell, PLoSOne, Journal of Morphology, EvoDevo, Journal of Sexual Medicine, Faculty of 1000, JoVE, Regeneration