

CURRICULUM VITAE

Alexander AWGULEWITSCH, Dr. rer. nat.

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Education

1974 - 1979: Teacher's Diploma in Biology and Physical Education for the German Gymnasium;
University of Bielefeld, Germany.

1980 - 1984: Dr. rer. nat. (Ph.D.) in Molecular Genetics; Institute of Genetics, University of Düsseldorf,
Germany.

Research and Professional Experience

1984 - 1988: Postdoctoral Associate; Laboratory of Dr. Frank Ruddle, Department of Biology, Yale
University, New Haven, CT.

1988 - 1993: Assistant Professor; Department of Biochemistry & Molecular Biology, Medical University of
South Carolina (MUSC), Charleston, SC;
Associate Professor, July 1, 1992.

1993 - present: Associate Professor; Dept. of Medicine/ Div. Rheumatol. & Immunol., MUSC;
Tenure, Jan. 2003

1994 - present: Adjunct faculty member, Dept. of Dermatology;

1995 - present: Member, Hollings Cancer Center, MUSC.

2000 - present: Director, MUSC Transgenic Mouse Core Facility (since Sept. 2000).

Research Grants

ACTIVE GRANTS – A. AWGULEWITSCH as PI.

1. **NIH/NIAMS 1R21AR053639-02**, “Genetic Pathways of Hair Medulla Differentiation – Paradigms for Development”; 4/1/06-3/31/08; total costs FY 07/08: \$186,225; 20% effort.
2. **NIH/NIAMS R01 AR47204-05A1**, “Roles of Hox Genes in Skin and Hair Follicle Development”; 9/01/07-8/31/11; total costs FY 07/08: \$221,130; 40% effort.
3. PI - Gene Analysis Core, **NIH/NCI P01 Grant CA78582-07**, “Role of Ets genes in transformation and differentiation”; Program Director – Dennis Watson; 6/15/05-3/31/10; total direct costs for Gene Analysis Core FY 07/08: \$120,372; 5% effort.
4. **URRF Funding**, MUSC Transgenic Mouse Core, 7/1/99-6/3/30/08; total costs: \$ 58,000; 10% effort.
5. National Alopecia Areata Foundation Research Grant, “Molecular Analysis of Hair Follicle Structural Changes in Alopecia Areata Mice”; 1/1/07-31/12/07; total costs FY 07/08: \$20,000.

ACTIVE GRANTS – A. AWGULEWITSCH as co-PI.

1. **NIH/NCRR 1P20 PR16434-06** (Markwald, PI), SC COBRE for Cardiovascular Diseases, Core D – Gene Function; 9/30/01-8/31/11; total costs FY07/08: \$249,948; 10% effort.

PENDING GRANT APPLICATIONS

1. **NIH/NHLBI R01** (Awgulewitsch, PI), “Hox-specified positional identities in the cardiovascular system”; 12/1/08-11/30/13; total direct costs first FY: \$268,500; 35% effort.
2. **NIH/NIAMS R01** (Sundberg, The Jackson Lab, PI – Awgulewitsch, co-PI), “Genetics of Alopecia Areata in the C3H/HeJ Mouse”; 12/1/08-11/30/13; total direct costs for subcontract first FY: \$36,500.

PREVIOUS GRANTS – A. AWGULEWITSCH as PI.

1. Health Sciences Foundation through private funding (**Westvaco Corp.**), **Grant # 22110**; April 01, 1987 - March 31, 1991; total award: \$ 125,000.
2. MUSC Institutional American Cancer Society Research Grant # IN-175, "Functional Analysis of a Murine Homeobox Locus"; March 01, 1988 - February 29, 1989; \$ 10,000.
3. MUSC Institutional Research Grant # PJ-02, "Functional Analysis of a Murine Homeobox Locus"; May 01, 1988 - April 30, 1989; \$ 30,000.
4. MUSC Institutional Research Grant # PJ-02; April 01, 1989 - March 31, 1990; \$ 44,995.
5. National Institutes of Health (**NIH**), **GM 43334**, "Analysis of a Murine Homeobox Locus"; April 01, 1989 - March 31, 1994; total amount of direct costs: \$ 358,485.
6. MUSC Institutional Research Grant, "Patterning Functions and Transcriptional Control of AbdominalB Related Hoxc Genes" ; Sept. 01, 1994 - August 31, 1995; \$ 20,000.
7. J. A.Shannon Director's Award, **NIH (2 R55 GM43334-06)**, Sept. 12, 1994 - Sept. 11, 1996; \$ 100,000.
8. **NIH Grant 2R01 GM 43334-06A2**, "Analysis of a Murine Homeobox Locus"; Jan. 01, 1996 - Dec. 31, 1999; total costs for entire project period: \$ 853,183.
9. **DOD** phase VI grant for breast cancer, "Hox expression profiles in mammary gland tumors – a prognostic tool?"; Sept. 01, 2003 – Aug. 31. 2005; total direct costs: \$ 100,000.

PREVIOUS COLLABORATIVE AGREEMENTS – A. AWGULEWITSCH as co-PI.

1. 10% effort on **NIH Grant # 1R29 CA67973-01A1** with Dr. David Cole as P.I., "T-Cell Recognition of Tumor Antigen", July 01, 1997 - June 30, 2002; total costs for entire project period: \$ 349,950.
2. 10% effort on **US Dept. of Defense** Grant with Dr. Ionna Maroulakou as P.I., " Roles of Specific Hormone-Mediator Hox Genes in Prepubertal Breast Development and Cancer"; June 01, 2000 - May 31, 2002; total costs: \$ 97,000.
3. 20% effort on **US Dept. of Defense Grant** with Dr. Demetri Spyropoulos as P.I., "Translational Applications of the Homeobox Gene Families"; June 01, 2001 - May 31, 2003; total costs: \$ 150,000.
4. **NIH Grant RR-02-003**, Centers for Biomedical Research Excellence (COBRE) in Lipidomics and Pathobiology, Dr. Lina Obeid as P.I.; 10% effort as Co-Investigator on Core C (Animal Pathobiology Core); Oct 01, 2002 – Sept. 30, 2007, total costs Core C: \$655,000.

Teaching Responsibilities and Mentoring of Graduate/Undergraduate Students and PostdocsLectures

I gave the following lectures to Ph.D. graduate students from the Department of Biochemistry and the Molecular and Cellular Biology and Pathobiology Program (MCBP), as well as to medical students at MUSC:

- Course "Molecular Genetics", Spring Semesters from 1989 through 2001; four 1 hr lectures in Developmental Genetics during each semester.
- Course "Foundations in Biochemistry and Molecular and Cell Biology I", Fall Semesters 1990 through 1992; fifteen 90 min lectures in '90 and '91, and seven 50 min lectures in '92.
- Biochemistry Conference for Medical Students in Developmental Genetics, Fall Semesters 1992, '94 through '97; ten 2 hours sessions.
- Course "Techniques in Immunology and Molecular Genetics", Fall Semesters 1995 through '99; two 60 min lectures concerning the generation of transgenic animals.
- Course " Technology", Fall Semester 2001, two 1 hr lectures in Transgenic Mouse Technology.
- Course: Path 792, "Histology and Pathology of Laboratory Mouse", Spring Semester 09; involvement with structuring the course, lecturing, exam, and student presentations.

MCBP Ph.D. Graduate Student Thesis Mentor

- Ron Peterson, Ph.D. 1993 - Head of Pharmacogenomics US at Novartis Pharmaceuticals;
- Chris Potter, 5th year MCBP Ph.D. graduate student;
- Nathan Pruett, 4th year MCBP Ph.D. graduate student.

Ph.D. Thesis Advisory Committees

- Eric Everett, Ph.D. 1993;
- Silvia Alejandra Garcia-Gasca, Ph.D. 2000;
- Eric Grund, Ph.D. 2004;
- Peter Wieckowski

Undergraduate Students/Foreign Exchange Students:

Stefanie Herzog from the University of Applied Sciences in Berlin, Germany; Training in Molecular Biology and Transgenic Mouse Methodology, two six months episodes during 2002 and 2003; present: Ph.D. Grad. Student, University of Heidelberg, Germany.

Postdoctoral Fellows:

- Dr. Thomas Papenbrock from the University of Düsseldorf (1992-1999); present: Lecturer, School of Biological Sciences, University of Southampton, U.K.
- Dr. Lisa Shang from China Agricultural University in Beijing (1997-1999); present: Research Associate, Dept. of Medicine/Div. of Cardiology, Emory University, Atlanta.
- Dr. Andrei Tkatchenko from the University of Moscow/Russian Academy of Sciences (1997-2000); present: Assistant Professor, Dept. of Ophthalmology, MUSC, Charleston.
- Dr. Tatiana Tkatchenko from the University of Moscow (2003-2004); present: Postdoctoral Fellow, Dept. of Cell Biology, MUSC, Charleston.

Administrative Services

- Member, MCBP Graduate Students Admissions Committee; March 1990 - 1996.
- Member, University Research Committee; 1995 - 1998.
- Member, URRF Advisory Committee for the MUSC Gene Targeting Facility; 1995 - 2000.
- Member, URRF Advisory Committee for the MUSC Transgenic Mouse Core Facility; 1996 - '99.
- Chair, Seminar Committee of the Department of Biochemistry; June 1989 - March 1993.

Peer Review

- Review of numerous grant proposals submitted to the University Research Committee at MUSC
- *Ad Hoc* reviewer for the National Science Foundation (1990, '92, '95, 2001).
- *Ad Hoc* reviewer for several journals including PNAS, Genomics, Development, Mech. Dev., FASEB, Dev. Dyn.; Pediatric and Developmental Pathology, etc.
- Member of a site visit panel for reviewing a NIH project program grant (1991).
- Member of NIH study section Human Embryology and Development2 (HED2), June '98; invitation to serve on NIAMS committee for SDRC (Skin Diseases Research Core Center) applications, May 03.
- Member of grant review panel for Phillip Morris Research Management Group, 02 – present.

Invited Lectures

- Grand Rounds, University of Nebraska Medical Center, Omaha, NE; Feb. 14, 1991.
- Developmental Genetics Seminar Series, The Jerome Holland Laboratory, American Red Cross, Rockville, MD; Feb. 03, 1993.
- South-Eastern Regional Developmental Biology Conference, Athens, GA; May 15, 1993
- 42nd Perinatal and Developmental Medicine Symposium "Lung Biology: Current Issues", sponsored by Mead Johnson Nutritionals, Park City, Utah; two lectures on June 11/12, 1993.
- McGill Cancer Center, Montreal, Canada; Nov. 05, 1993.
- Centre de Biochimie, Centre National de la Recherche (CNRS) Nice, France; May 02, 1995.

- Institut de Génétique Moléculaire, CNRS Montpellier, France; May 03, 1995.
- Institut für Biochemie, Medizinische Fakultät, University of Cologne, Germany; March 07, 1996.
- Mercer University, Macon, GA; Dec. 09, 1996.
- German Cancer Centre, Heidelberg, Germany, Oct. 22, 2001.
- University of South Carolina at Aiken, SC, Jan. 30, 2004.
- 4th Intercontinental Meetg. of Hair Research Societies, Berlin, chair and presentation – session on hair follicle morphogenesis and cycling; June 18, 2004.
- German Cancer Research Center, Section of Epidermal and Neoplastic Epidermal Differentiation, Heidelberg, Germany, June 29, 2004.
- The Jackson Laboratory, Bar Harbor, ME, Nov. 17, 2005.
- Presentation at 2005 Society of Investigative Dermatology Meeting, St. Louis, MO, May 06, 2005.

Honors

- Health Sciences Foundation Developing Scholars Award, MUSC (1991).
- Citation in the Science and Technology section of the “Economist”, Sept. 18, 1993.
- James A. Shannon Director's Award, National Institute of Health (1994).
- Citation in Scott F. Gilbert (ed.) *Developmental Biology*, 4th edition (1994).
- Marquis Who's Who in the South and Southwest 1994/95.
- Member of NIH study section Human Embryology and Development 2 (HED2), June '98.

Publications

Reviewed Papers and Book Chapters (underlined)

Ruddle, F.H., Hart, C.P., **Awgulewitsch, A.**, Fainsod, A., Utset, M., Dalton, D., Kerk, N., Rabin, M., Ferguson-Smith, A., and McGinnis, W. Mammalian homeo box genes. *Cold Spring Harbor Symp. Quant. Biol.* 50: 277-284 (1985).

Hart, C.P., **Awgulewitsch, A.**, Fainsod, A., McGinnis, W., and Ruddle, F.H. Homeo box gene complex on mouse chromosome 11: molecular cloning, expression in embryogenesis, and homology to a human homeo box locus. *Cell* 43: 9-18 (1985).

Awgulewitsch, A., and Bünemann, H. Isolation of Y-chromosomal repetitive DNA sequences of *Drosophila hydei* via enrichment of chromosome specific sequences by heterogeneous hybridization between female and male DNA. *J. Biochem. and Biophys. Meth.* 12: 37-50 (1986).

Awgulewitsch, A., Utset, M.F., Hart, C.P., McGinnis, W., and Ruddle, F.H. Spatial restriction in expression of a mouse homeo box locus within the central nervous system. *Nature* 320: 328-335 (1986).

Awgulewitsch, A., Utset, M.F., Hart, C.P., Fainsod, A., McGinnis, W., and Ruddle, F.H. Organization of murine homeo box loci and their spatially restricted expression during development. Molecular approaches to developmental biology, *UCLA Symp.on Molec.and Cell.Biol., New Series*, Vol. 51: 147-165, Alan R. Liss, Inc., New York, NY (1986).

Utset, M.F., **Awgulewitsch, A.**, Ruddle, F.H., and McGinnis, W. Region specific expression of two mouse homeo box genes. *Science* 235: 1379-1382 (1987).

Fienberg, A.A., Utset, M.F., Bogarad, L.D., Hart, C.P., **Awgulewitsch, A.**, Ferguson-Smith, A., Fainsod, A., Rabin, M., and Ruddle, F.H. Homeo box genes in murine development. In: *Current Topics in Developmental Biology*, Vol. 21: 233-256 (1987).

Fainsod, A., **Awgulewitsch, A.**, and Ruddle, F.H. Expression of murine homeo box gene Hox 1.5 during embryogenesis. *Dev. Biol.* 124: 125-133 (1987).

- Wlaschek, M., **Awgulewitsch, A.**, and Bünemann, H. Structure of Y chromosomal DNA. *Chromosoma (Berl)* 96: 145-158 (1988).
- Schughart, K., Utset, M.F., **Awgulewitsch, A.**, and Ruddle, F.H. Structure and expression of Hox-2.2, a murine homeobox-containing gene. *Proc. Natl. Acad. Sci. USA* 85: 5582-5586 (1989).
- Bogarad, L., Utset, M.F., **Awgulewitsch, A.**, Miki, T., Hart, C.P., and Ruddle, F.H. The developmental expression pattern of a new murine homeo box gene: Hox 2.5. *Dev. Biol.* 133: 537-549 (1989).
- Awgulewitsch, A.**, and Jacobs, D. Differential expression of Hox 3.1 protein in subregions of the embryonic and adult spinal cord. *Development* 108: 411- 420 (1990).
- Awgulewitsch, A.**, Bieberich, C., Bogarad, L., Shashikant, C., and Ruddle, F.H. Structural analysis of the Hox 3.1 transcription unit and the Hox 3.2-Hox 3.1 intergenic region. *Proc. Natl. Acad. Sci. USA* 87: 6428-6432 (1990).
- Bieberich, C.J., Utset, M.F., **Awgulewitsch, A.**, and Ruddle, F.H. Evidence for positive and negative regulation of the Hox 3.1 gene. *Proc. Natl. Acad. Sci. USA* 87: 8462-8466 (1990).
- Awgulewitsch, A.**, and Utset, M.F. Detection of specific RNA sequences in tissue sections by in situ hybridization. In: Chao, L., Karam, J., Warr, G. eds. In: *Methods in Nucleic Acids Research*. CRC Press, Inc. Boca Raton, FL, pp.359-375 (1991).
- Peterson, R., Jacobs, D., and **Awgulewitsch, A.** Hox-3.6: isolation and characterization of a new murine homeobox gene located in the 5' region of the Hox-3 cluster. *Mech. Dev.* 37: 151-166 (1992).
- Hirayama, F., Shih, J.P., **Awgulewitsch, A.**, Warr, G.W., Clark, S.C., Ogawa, M. Clonal proliferation of murine lymphohemopoietic progenitors in culture. *Proc. Natl. Acad. Sci. USA* 89: 5907-5911 (1992).
- Awgulewitsch, A.** and Jacobs, D. Deformed autoregulatory element from Drosophila functions in a conserved manner in transgenic mice. *Nature, London* 358: 341-344 (1992).
- Peterson, R., Papenbrock, T., Davda, M.M. and **Awgulewitsch, A.** The murine Hoxc cluster contains five neighboring AbdB-related genes that show unique spatially coordinated expression in posterior embryonic subregions. *Mech. Dev.* 47: 253-260 (1994).
- Papenbrock, T., Peterson, R.L., Lee, R.S., Hsu, T., Kuroiwa, A. and **Awgulewitsch, A.** Murine Hoxc-9 gene contains a structurally and functionally conserved enhancer. *Dev. Dynamics* 212:540-547 (1998).
- Papenbrock, T., Visconti, R. P. & **Awgulewitsch, A.** Loss of fibula in mice overexpressing Hoxc-11. *Mech. Dev.* 92: 113-123 (2000).
- Tkatchenko, A., Visconti, R.P., Shang, L., Papenbrock, T., Ito, T., Pruet, N.D., Ogawa, M. & **Awgulewitsch, A.** Overexpression of Hoxc13 in differentiating keratinocytes results in downregulation of a novel hair keratin gene cluster and alopecia. *Development* 128, 1547-1558 (2001).
- Shang, L. Pruet, N.D. & **Awgulewitsch, A.** Hoxc12 expression pattern in developing and cycling hair follicles. *Mech. Dev.* 113, 207-210 (2002).
- Awgulewitsch, A.** Hox genes in hair growth and development; *Naturwissenschaften* 90, 193-211 (2003); COVER – invited review.

Pruett ND, Tkatchenko TV, Jave-Suarez L, Jacobs DF, Potter CS, Tkatchenko AV, Schweizer J, & **Awgulewitsch A**. *Krtap16*: characterization of a new hair keratin-associated protein (KAP) gene complex on mouse chromosome 16 and evidence for regulation by *Hoxc13*. *J Biol Chem*. 279: 51524-51533 (2004).

Peterson RL, Tkatchenko TV, Pruet ND, Potter CS, Jacobs DF, and **Awgulewitsch A**. Epididymal cysteine-rich secretory protein 1 (CRISP-1) encoding gene is expressed in murine hair follicles and downregulated in mice overexpressing *Hoxc13*. *J. Invest. Dermatol. Symp. Proc.* 10:238-242, 2005.

Potter CS, Peterson RL, Barth JL, Pruet ND, Jacobs DF, Kern M, Argraves WS, Sundberg JP, **Awgulewitsch A**. Evidence that the satin hair mutant gene *Foxq1* is among multiple and functionally diverse regulatory targets for *Hoxc13* during hair follicle differentiation. *J. Biol Chem*. 281, 29245-2955 (2006).

Pruett ND, Visconti RD, Scholz D, Jacobs DF, McQuinn T, Sundberg JP, **Awgulewitsch A**. Evidence for Hox-specified positional identities in adult vasculature. *BMC Dev Biol* 8:93, 2008.

Mentzer SE, Sundberg JP, **Awgulewitsch A**, Chao HHJ, Carpenter DA, Zhang WD, Rinchik EM, You Y. The mouse hairy ears mutation exhibits an extended growth (anagen) phase in hair follicles and altered *Hoxc* gene expression in the ears. *Vet. Dermatol.* 19, 358-367, 2008

Giehl KA, Potter CS, Wu B, Silva KA, Rowe LB, **Awgulewitsch A**, Sundberg JP. Hair interior defect in AKR/J mice. *Clin and Exp Dermatol*, 34, 2009.

Bazzi H, Demehri S, Potter CS, Getz A, **Awgulewitsch A**, Kopan R, Christiano AM. Regulation of Desmoglein 4 expression by transcription factors implicated in hair shaft differentiation (submitted).

Wu B, Silva KA, Liang Y, Petell L, Rowe LB, Seymour RE, Potter CS, Roopenian DC, **Awgulewitsch A**, Sundberg JP. Mutations in sterol O-acyltransferase 1 (*Soat1*) results in hair interior defects in AKR/J mice (submitted)

Potter CS, Pruet ND, Kern MJ, Godwin AR, Sundberg JP, **Awgulewitsch A**. *Foxn1* is a regulatory target of *Hoxc13* in ectodermal development and dysplasia. (manuscript in preparation).

Potter CS, Pruet ND, Kern MJ, Godwin AR, Sundberg JP, Sambamurti K, **Awgulewitsch A**. Dysregulation of *Soat1* in *Hoxc13* null mice is associated with structural defects in the brain and behavioral abnormalities. (manuscript in preparation)

Potter CS, Godwin AR, Petell L, Sundberg JS, **Awgulewitsch A**. *Hoxc13* null mice exhibit defects in onycholemmal development. (manuscript in preparation).

Invited Lectures and Oral Presentations 2007-2009:

- October 25-07, invited seminar at the Max Planck Institute for Biophysical Chemistry, Goettingen, Germany.
- March 12-08, invited seminar at the University of Duisburg-Essen, Institute for Anatomy, Essen, Germany.
- May 16-08, invitation for oral presentation at 2008 Society of Investigative Dermatology Meeting, Kyoto, Japan, presented by graduate student Chris Potter.
- March 23-09, invited seminar at the Department of Pathology, MUSC.

Student Achievements 2008/2009:

- 1st place for graduate student Chris Potter at the annual 2008 Department of Medicine Research Day.