

Curriculum Vitae

Name: Anthony A. Capehart
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Address: Department of Biology
C407 Howell Science Complex
East Carolina University
Greenville, NC 27858

Education:

Ph.D. Wake Forest University - Bowman Gray School of Medicine, Anatomy
M.S. University of North Carolina - Wilmington, Marine Biology
B.A. University of North Carolina - Chapel Hill, English

Professional Experience:

2005- Associate Professor, Department of Biology, East Carolina University
1999-2005 Assistant Professor, Department of Biology, East Carolina University
1997-1999 Research Assistant Professor, Department of Cell Biology and Anatomy,
Medical University of South Carolina
1994-1997 Research Associate, Department of Cell Biology and Anatomy, Medical
University of South Carolina (Co-investigator (Dr. EL Krug, PI), Project II
NIH PO1, Cardiac Valvuloseptal Morphogenesis)
1991-1994 Postdoctoral Fellow, Department of Biology, University of Iowa, Advisor,
M Solursh

Research Interest:

Cell - extracellular matrix interactions during embryonic limb and heart development

Honors and Awards:

2011 East Carolina University Harriot College of Arts & Sciences, College
Research Award
2009-10 East Carolina University Teaching Grant
2009-10 Finalist, University Alumni Teaching Award
1992-93 National Research Service Award, NIH Institute of Child Health and
Human Development
1991 Graduate Assistantship, Bowman Gray School of Medicine, Wake Forest
University
1989 Dean's Fellowship, Bowman Gray School of Medicine, Wake Forest
University
1988 Department of Biological Sciences Competitive Research Fellowship,
University of North Carolina - Wilmington

Journal Articles:

Hudson KS, Andrews K, Early J, Mjaatvedt CH, **Capehart AA**. 2010. Versican G1
domain and V3 isoform overexpression results in increased chondrogenesis in
the developing chick limb in ovo. *Anat Rec*; Early view doi:10.1002/ar.21235.

- Pugh AM, Silvestri BA, Ward MA, Whited WM, **Capenhart AA**. 2010. Unusual bilateral muscular variation in the medial forearm: Separate humeral and ulnar bellies of flexor carpi ulnaris and anomalous muscle addition. *Anatomy*, Online preprint doi10.2399/ana.09.045.
- Capenhart AA**. 2010. Proteolytic cleavage of versican during limb joint development. *Anat Rec*, 293:208-214.
- Shepard JB, Gliga DA, Morrow AP, Hoffman S, **Capenhart AA**. 2008. Versican knock-down compromises chondrogenesis in the embryonic chick limb. *Anat Rec* 291: 19-27.
- Cronin KD, **Capenhart AA**. 2007. Gamma protocadherin expression in the embryonic chick nervous system. *Intl J Biol Sci* 3: 8-11.
- Shepard JB, Krug HA, LaFoon BA, Hoffman S, **Capenhart AA**. 2007. Versican expression during synovial joint morphogenesis. *Intl J Biol Sci* 3:380-384.
- Williams DR, Presar AR, Richmond AT, Mjaatvedt CH, Hoffman S, **Capenhart AA**. 2005. Limb chondrogenesis is compromised in the versican deficient hdf mouse. *Biochem Biophys Res Comm* 334: 960-966.
- Snow HE, Riccio LM, Mjaatvedt CH, Hoffman S, **Capenhart AA**. 2005. Versican expression during skeletal/joint morphogenesis and patterning of muscle and nerve in the embryonic mouse limb. *Anat Rec* 282: 95-105.
- Richmond AT, Atwood J, Bream J, Mjaatvedt CH, Hoffman S, **Capenhart AA**. 2004; published 2005. Neural tissue co-culture with mesenchyme to investigate patterning of peripheral nerve during murine embryonic limb development. *Cytotechnology*, 46: 173-182.
- Zhu Y, Stiller JW, Shaner MP, Baldini A, Scemama J L, **Capenhart AA**. 2004. Cloning of somatolactin a and b cDNAs in zebrafish and phylogenetic analysis of two distinct somatolactin subtypes in fish. *J Endocrinology* 182: 509-518.
- Capenhart AA**, Kern CB. 2003. Identification of gamma A-like protocadherin expressed during chick development. *J Cell Biochem* 90:608-618.
- Gillotte DM, Fox PL, Mjaatvedt CH, Hoffman S, **Capenhart AA**. 2003. An in vitro method for analysis of chondrogenesis in limb mesenchyme from individual transgenic (hdf) embryos. *Meth Cell Sci* 25: 97-104.
- Capenhart AA**, Scemama JL, Singhas CA, Cox S. 2002. Heterogeneity of chondroitin sulfate glycosaminoglycan localization during early development of the striped bass (*Morone saxatilis*). *Anat Rec* 268: 47-58.
- Capenhart A A**, Giaimo A, Singhas CA. 2002. Distribution of chondroitin sulfate glycosaminoglycans in the human chorio-amnionic membrane complex at term. *J NC Acad Sci* 119: 1-12.
- Capenhart AA**. 2000. In vitro production of monoclonal antibodies to embryonic chick limb mesenchyme. *Meth Cell Sci* 22: 319-327.
- Bianchi LM, Liu H, Krug EL, **Capenhart AA**. 1999. Selective and transient expression of a native chondroitin sulfate epitope in Dieter's cells, pillar cells, and the developing tectorial membrane. *Anat Rec* 256: 64-71.
- Biddulph DM, Dozier MM, **Capenhart AA**. 1999. Inhibition of prostaglandin synthesis reduces cyclic AMP levels and inhibits chondrogenesis in cultured chick limb mesenchyme. *Meth Cell Sci* 22:9-16.
- Capenhart AA**, Mjaatvedt CH, Hoffman S, Krug EL. 1999. Dynamic expression of a native chondroitin sulfate epitope reveals microheterogeneity of extracellular matrix organization in the embryonic chick heart. *Anat Rec* 254: 181-195.

- Mjaatvedt CH, Yamamura H, **Capehart** AA, Turner D, Markwald RR. 1998. The Cspg2 gene, disrupted in the hdf mutant, is required for right cardiac chamber and endocardial cushion formation. *Dev Biol* 202:56-66.
- Capehart** AA, Biddulph DM. 1997. Changes in adenylate cyclase activity during chondrogenesis in chick limb mesenchyme. *Meth Cell Sci* 19:121-127.
- Capehart** AA, Wienecke MM, Kitten GT, Solursh M, Krug EL. 1997. Production of a monoclonal antibody by in vitro immunization that recognizes a native chondroitin sulfate epitope in the embryonic chick limb and heart. *J Histochem Cytochem* 45: 1567-1581.
- Krug EL, Reazee M, Isokawa L, Turner DK, Litke LL, Wunsch AM, Bain JL, Riley DA, **Capehart** AA, Markwald RR. 1995. Transformation of cardiac Endothelium into cushion mesenchyme is dependent upon ES/130: temporal, spatial, and functional studies in the early chick embryo. *Cell Mol Biol Res* 41:263-277.
- Capehart** AA, Dillaman RM, Ballard TA. 1992. Use of rhodamine 123 to identify viable cells isolated from embryonic chick calvaria. *J Tiss Culture Meth* 14: 79-84.
- Biddulph DM, **Capehart** AA, Beasley TC. 1991. Comparative effects of Cytosine arabinoside and a prostaglandin E2 antagonist, AH6809, on chondrogenesis in serum-free cultures of chick limb mesenchyme. *Exp Cell Res* 196: 131-133.
- Capehart** AA, Biddulph DM. 1991. Effects of a putative prostaglandin E2 antagonist, AH6809, on chondrogenesis in serum-free cultures of chick limb mesenchyme. *J Cellular Phys* 147: 403-411.
- Capehart** AA, Biddulph DM. 1991. Development of PTH-responsive adenylate cyclase activity during chondrogenesis in cultured mesenchyme from chick limb buds. *Calcif Tissue Intl* 48: 400-406.
- Capehart** AA, Biddulph DM, Dozier MM, Julian NC. 1990. Responsiveness of adenylate cyclase to PGE2 and forskolin in isolated cells from micromass cultures of chick limb mesenchyme during chondrogenesis. *Prostaglandins* 3: 167-178.
- Capehart** AA, Hackney CT. 1989. The potential role of roots and rhizomes in structuring salt marsh benthic communities. *Estuaries* 12:119-122.

Proceedings:

Abstracts

- Lee S, LaFoon B, Mehaffey J, Capehart A. 2009. The role of the G3 domain of versican during chondrogenesis within the embryonic chick limb. *J NC Acad Sci* 125:120.
- Morrow A, Lee S, Gillis C, LaFoon B, Stolic J, Capehart A. .2008. Recombinant versican G3 domain over-expression in the developing chick limb. *J NC Acad Sci* 124:130.
- Shepard J, Gliga D, Krug H, Morrow A, Capehart A. 2007. Knock-down of versican proteoglycan compromises chondrogenesis in the embryonic chick limb. *J NC Acad Sci* 123: 210.
- Shepard J, Yee L, Hoffman S, Capehart A. 2006. Chondroitin sulfate proteoglycan expression during synovial joint morphogenesis in the embryonic chick limb. *J NC Acad Sci* 122:92.
- Cronin K, Scemama JL, Capehart AA. 2005. Spatial and temporal expression of gamma A-like protocadherin during chick embryonic development. *J NC Acad Sci*, 121: 87.

- Richmond AT, Williams DR, Atwood J, Bream J, Hoffman S, Mjaatvedt C, Capehart AA. 2004. The effect of versican (Cspg-2) on the migration of muscle and nerve. *J NC Acad Sci* 120:78.
- Snow HE, Riccio L, Hoffman S, Mjaatvedt C, Singhas C, Capehart AA. 2004. Versican expression in patterning of muscle and nerve in the embryonic mouse limb. *J NC Acad Sci* 120: 85.
- Tull RL, Singhas B, Capehart AA, Scemama JL, Singhas CA. 2004. Alterations in the expression of glycoconjugates in selected tissues during the early development of the striped bass, *Morone saxatilis*. *J NC Acad Sci* 120: 87.
- Williams DR, Presar AR, Richmond AT, Mjaatvedt C, Hoffman S, Capehart AA. 2004. Implications of a disrupted Cspg2 gene on murine chondrogenesis. *J NC Acad Sci* 120: 90.
- Capehart AA, Kern CB. 2003. Identification of gamma A-like protocadherin expressed during chick development. *Dev Biol* 259: 552.
- Loomer MR, Bianchi LM, Mjaatvedt CH, Daniel HJ, Kalmus GW, Capehart AA. 2003. Versican (Cspg2) expression during inner ear development. *J NC Acad Sci* 119:77.
- Singhas BA, Tull RL, Capehart AA, Scemama JL, Singhas CA. 2003. Expression of glycoconjugates in selected tissues during early development of the striped bass, *Morone saxatilis*. *J NC Acad Sci* 119: 86.
- Snow HE, McGinty K, Riccio L, White E, Mjaatvedt C, Singhas C, Capehart AA. 2003. Spatial and temporal expression of versican in the hdf mutant mouse limb. *J NC Acad Sci* 119: 87.
- Tull RL, Capehart AA, Scemama JL, Singhas CA. 2002. Glycoconjugate distribution during embryonic development of the striped bass, *Morone saxatilis*. *J NC Acad Sci* 119:133.
- Mironov VA, Wessels A, Capehart A, Krug E, Markwald RR. 1996. The functional role of metalloproteinases and their inhibitor in the endothelial mesenchymal transformation during cushion tissue morphogenesis. *FASEB J* 10: A772.
- Shirazi S, Capehart AA, Daniels K, Solursh M, Chittick V, Schulz-Delrieu K. 1995.. Matrix proteins in the hypertrophic smooth muscle of the chronically obstructed opossum esophagus. *FASEB J* 9: A86.
- Wienecke MM, Mjaatvedt CH, Capehart AA, Markwald RR, Krug EL. 1995. Identification of a murine homolog of chicken ES/130: a protein which plays an integral role in endocardial cushion development. *Circulation* 92:116.
- Capehart AA, Biddulph DM. 1991. Inhibition of chondrogenesis in serum-free cultures of chick limb mesenchyme by the putative prostaglandin E2 antagonist, AH6809. *Anat Rec* 229:13A.
- Capehart AA, Biddulph DM. 1990. Responsiveness of adenylate cyclase to PGE2 and forskolin in isolated cells from micromass cultures of chick limb mesenchyme during chondrogenesis. *Anat Rec* 226:18A.
- Capehart AA, Dillaman RM, Ballard TA. 1989. Use of rhodamine 123 to identify viable cells isolated from chick calvaria. *Anat Rec* 223: 21-22A.
- Dozier MM, Capehart AA, Julian NC, Biddulph DM. 1989. Forskolin activates adenylate cyclase and accelerates chondrogenesis in chick limb mesenchyme in vitro. *Anat Rec* 223: 34A.
- Ballard TA, Dillaman RM, Capehart T. 1987. Characterization of chick osteogenic cells grown on filters. *Anat Rec* 218:14A.

Symposia

- Capehart AA, Kern CB. 2003. Identification of gamma A-like protocadherin expressed during chick development. Presented at Society for Developmental Biology, Boston, Massachusetts.
- Gillotte DM, Mjaatvedt CH, Capehart AA. 2001. Effect of an insertional mutation of the Cspg-2 gene in mouse limb development in vitro. Presented at Society for Developmental Biology, Asheville, North Carolina.
- Capehart AA, Mjaatvedt C, Hoffman S, Krug EL. 1998. Regionalization of a chondroitin sulfate epitope is correlated with remodeling events in the early chick heart. Presented at Weinstein Cardiovascular Development Conference, Nashville, Tennessee.
- Mjaatvedt CH, Yamamura H, Capehart A, Turner D, Markwald RR. 1998. The Cspg2 gene, disrupted in the hdf mutant, is required for right cardiac chamber and endocardial cushion formation. Presented at Weinstein Cardiovascular Development Conference, Nashville, Tennessee.
- Zanin MK, Capehart A, Krug E, Hoffman S. 1998. Distinct spatial distributions of versican, aggrecan, and arp in the embryonic chick heart. Presented at Weinstein Cardiovascular Development Conference, Nashville, Tennessee.
- Capehart AA, Rittmann T, Kitten G, Krug EL. 1997. Production of monoclonal antibodies by in vitro immunization to extracellular antigens in the developing chick heart. Presented at Weinstein Cardiovascular Development Conference, Cincinnati, Ohio.
- Kern CB, Wienecke M, Mjaatvedt C, Capehart A, Turner DK. 1997. Developmentally regulated expression of a murine homolog to chicken ES/130. Presented at Weinstein Cardiovascular Development Conference, Cincinnati, Ohio.
- Krug EL, Capehart A, Moreno R, Litke LL. 1995. ES/130 and protease activity correlate with AV cushion formation. Presented at Weinstein Cardiovascular Development Conference, Rochester, New York.
- Capehart A. 1991. Inhibition of chondrogenesis in serum-free cultures of chick limb mesenchyme by the putative prostaglandin E2 antagonist, AH6809. Presented at American Association of Anatomists, Chicago, Illinois.

Invited Lectures:

- 2010- Versican Proteoglycan: A role in limb morphogenesis? Dept of Cell Biology and Anatomy, Brody School of Medicine, East Carolina University
- 2007- Out on a Limb: Versican proteoglycan in skeletogenesis. Dept of Cell Biology and Anatomy, Brody School of Medicine, East Carolina University
- 2006 - Limb chondrogenesis requires matrix versican proteoglycan. Dept. of Biochemistry and Molecular Biology, Brody School of Medicine, East Carolina University
- 2004 - Proteoglycans during embryonic development: Is it all just a GAG?. Dept. of Biology, East Carolina University
- 2004 - Versican proteoglycan in the embryonic limb: This bud's for you. Dept. of Biological Sciences, University of North Carolina - Wilmington
- 2001 - Limb and heart development: Two bags of GAGs. Dept. of Biology, Temple University
- 2000 - Building the embryonic limb and heart: Cell/matrix interactions during early development. Dept. of Anatomy and Cell Biology, Brody School of Medicine, East Carolina University

Research Grants:

Funded-External

2006-10 Capehart, A. A. (PI), "Effect of versican mutation on limb development in vitro (renewal)", GOV-National Institute of Child Health & Human Development (NICHD), \$212,678.

2003 Bond (PI), J. E., Goodwillie, C., Corbett, R., McIntyre, R., Woods, T., Capehart AA (Senior Investigator), "RUI: Acquisition of an Environmental Scanning Electron Microscope for Research and Teaching", GOV-National Science Foundation (NSF), \$256,422.

2002-04 Capehart, A. A. (PI), "Effect of versican mutation on limb development in vitro", GOV-National Institute of Child Health & Human Development (NICHD), \$139,500.

2001 Clough (PI), L. M., Farwell, M.A., West, T.L., & Capehart, A.A., "Does hypoxic preconditioning increase tolerance to hypoxia in estuarine fishes?", North Carolina Sea Grant, \$9,000.

1999 Scemama (PI), J. L., Farwell, M.A., Kalmus, G.W., & Capehart, A.A., "Development of a Cell Culture Facility for Biotechnology Education", North Carolina Biotechnology Center, \$76,404.

Funded-Internal

2010-2011 Capehart, A. A., "Changes in Synovial Joint Gene Expression in Response to Reduced Matrix Versican", East Carolina University Research and Creative Activities Grant, \$16,489.

2006 Capehart, A. A., "Protocadherin function in the developing chick", East Carolina University Research and Creative Activities Grant, \$19,623.

1999 Capehart, A. A., "Molecular characterization of a novel cell adhesion molecule, protocadherin, in the embryonic chick limb", East Carolina University Research and Creative Activities Grant, \$6,840.

Professional Service:

Manuscript Review:

Ad hoc Reviewer –

Journal of Cellular and Molecular Medicine

Biotechniques

European Journal of Cancer

Histology and Histopathology

Journal of the North Carolina Academy of Science

Proceedings of the Indian National Science Academy

Editorial Boards:

Editorial advisory board, Journal of Biochemical Technology

Proposal Review:

National Institutes of Health (NICHD), Member, Special Emphasis Panel/Scientific Review Group 2008/10 ZHD1 MRG-C (2008)

National Science Foundation, Ad hoc reviewer (2005-08)

American Heart Association, Member (2004-2006) and Vice-Chair (2007) MAT6 Study Section Basic Cell Biology and Cardiovascular Development

Professional Organizations:

Elected Member, Board of Directors, North Carolina Academy of Science (2004-06)
Chair, Annual Meeting Committee, North Carolina Academy of Science (2006-07)
Section Chairs Advisory Committee, North Carolina Academy of Science (2005-06)
Section Chair, Cell & Developmental Biology, North Carolina Academy of Science (2006)
Planning Committee, North Carolina Academy of Science (2004-05)

University Service:

Departmental Assignments

Co-Chair, Building Committee (2010)
Chair, Animal Care & Use Committee (2008-10)
Member, Imaging Core Committee (2009-10)
Chair, Developmental Biologists Search Committee (2008-09)
Member, Executive Committee (2007-09)
Member, Personnel Committee (2008-09)
Co-Chair, Personnel Committee (2007-08)
Member, Animal Care & Use Committee (2007-08)
Member, EM Research Staff Position Search Committee (2007-08)
Member, Electron Microscopy Committee (2007-09)
Chair, Electron Microscopy Committee (2000-06)
Chair, Space Committee (2004-06)
Chair, Anatomy & Physiology/Advising Search Committee (2005-06)
Alternate, Biology Graduate Committee (2006-07)
Co-Chair, departmental seminar Series (2002-04)
Member, Cell Biology search Committee (2002)
Member, Undergraduate Committee (2000-02)
Member, Undergraduate Curriculum Committee (2000-02)

University Assignments

Member, Institutional Animal Care & Use Committee (2007-10)
Member, Teaching Grants Committee (2001-05, 2006-07)
Alternate, Faculty Senate (2002-07)
Member, Citation Appeals Committee (2004-06)
Chair of the Faculty's Representative, Biological Safety Committee (2005-08)

Graduate Theses Directed:

Kristen Andrews. Effect of versican G1 and V3 over expression on chick limb synovial joint morphogenesis. M.S. in progress.
Sheelah Iyengar. Expression of chondroitin sulfate glycosaminoglycans during pituitary and thyroid development. M.S. in progress.
Ryan Vick. Validation of changes in gene expression in response to versican misexpression in the developing chick synovial joint. M.S. in progress.
Partha Nagchowdhuri. Effect of shRNA-mediated versican knock down on chick limb development in ovo. M.S. defense, Fall 2010.
Shelly Lee. Effect of versican G3 over expression on chick limb development in ovo. M.S. completed Fall 2009.
Karla Hudson. Effect of versican G1 and V3 over expression on chick limb development in ovo. M.S. completed summer 2009.

John B. Shepard. A role for versican during chick limb skeletogenesis. M.S. completed Summer 2007.

Maureen Loomer. Versican (Cspg2) expression during inner ear development. M.S. completed Summer 2005.

Todd Richmond. Effects of versican mutation on muscle and nerve patterning in vitro. M.S. completed 2004 (degree awarded 2006).

Holly Snow. Versican expression during skeletal/joint morphogenesis and patterning of muscle and nerve in the embryonic mouse limb. M.S. completed Summer 2004.

Ray Williams. An in vitro analysis of chondrogenesis utilizing the versican deficient hdf mutant mouse. M.S. completed Summer 2004.

Dani Gillotte. In vitro analysis of versican in limb chondrogenesis utilizing the hdf transgenic mouse. M.S. completed Summer 2003.

Thesis Committee, Member:

Member of 26 M.S. and 6 Ph.D. thesis committees, 1999-2010.

Undergraduate Research Directed:

Hosted 30 undergraduate students in independent lab research projects, 1999-2010.

Courses Taught:

ECU

Experimental Embryology & Lab (doctoral- BIOL 7090/7091)

Embryology & Lab (BIOL 4060/4061)

Human Gross Anatomy (BIOL 4071)

Human Gross Anatomy (specialized masters- BIOL 6071)

Human Physiology & Anatomy (BIOL 2130, BIOL 2140, BIOL 2150)

MUSC

Medical Gross Anatomy

WFU (Graduate Teaching Assistant)

Gross Anatomy of the Human Body

Microanatomy I (Cells and Tissues)

Microanatomy II (Organ Systems)