**CURRICULUM VITAE**

**Mescher, Anthony L., Ph.D.**

Emeritus Professor of Anatomy and Cell Biology

Medical Sciences, 202 Jordan Hall

Indiana University School of Medicine

Bloomington, Indiana 47405

**EDUCATION:**

B.S., 1971, Biology, St. Joseph's College, Rensselaer, Indiana

M.S., 1973, Developmental Biology, The Ohio State University, Columbus, Ohio

Ph.D., 1975, Developmental Biology, The Ohio State University, Columbus, Ohio, Thesis Director: Dr. Roy Tassava

NIH trainee, Summer 1973, Fertilization and Gamete Physiology Training Program, Marine Biological Laboratory, Woods Hole, Massachusetts

American Cancer Society Post-doctoral Fellow, 1975-76, laboratory of Dr. Denis Gospodarowicz, The Salk Institute of Biological Studies, La Jolla, California

Workshop in Molecular Biology, July, 1991, Indiana University School of Medicine.

**ACADEMIC APPOINTMENTS**:

Assistant Professor of Biological Sciences, Department of Biological Sciences, George Washington University, Washington, D.C., January, 1977-December, 1981.

Assistant Professor through Full Professor of Anatomy and Cell Biology, Indiana University School of Medicine, Bloomington, Indiana, January, 1982 – July, 2014.

Visiting Scientist, Laboratory of Developmental Biology with Dr. Jim Smith, National Institute of Medical Research, London, June-November, 1990.

Senior Fellow, Institute for Cellular and Molecular Biology, Indiana University, Bloomington, Indiana, July, 1992-July, 2014.

Senior Fellow, Center for Regenerative Biology and Medicine, Indiana University, July, 1999-July, 2014.

**PROFESSIONAL ORGANIZATIONS**:

American Association of Anatomists, 1982-present

Society for Developmental Biology, 1976-1994

American Society of Zoologists, (Division of Cell and Developmental Biology), 1973-1991

Association for International Research on Regeneration, 1990-present

American Association for the Advancement of Science, 1972-2012

Sigma Xi, 1978-1982

American Institute of Biological Sciences, 1969-1974

**HONORS AND AWARDS**:

President, college honor fraternity, Delta Epsilon Sigma

President, St. Joseph's College Student Chap. of the Amer. Inst. of Biol. Sciences

University Fellow, The Ohio State University, September 1971-June 1975

Mary H. Osburn Memorial Fellowship, June-August, 1975

Certificate of Honor for graduate research, The Ohio State University, 1975

American Cancer Society Post-doctoral Fellowship, 1976

Profiled in Marquis' *Who's Who in the East*, 18th edition, 1981-82

Recipient, Marcus Singer Medal for Research in Limb Development and Regeneration, 1986

Profiled in *American Men and Woman of Science*, 18th edition, 1992

Profiled in Marquis' *Who's Who in Science and Engineering*, 1st edition, 1992

Teaching Excellence Recognition Award, IUSM, 1998

Nominee, Student Choice Award for Outstanding Faculty, 1999

Indiana University Trustees Teaching Award, 2003, 2005

Recognition of Excellent Contributions to Medical Curriculum Development, 2014

**TEACHING**

Present teaching assignments:

* A560 Histology and Cell Biology, Course Director
* A464 Human Tissue Biology, Course Director

Prepare and update annually Laboratory Guides for the 2 histology courses

Regular participant in workshops for development of teaching at IUB and IUSM

1999-2004, developed Website for Human Tissue Biology: <http://www.indiana.edu/~a464/>

Symposium participant, *Histology Education and Assessment,* at Experimental Biology 2000, San Diego, Calif.

Co-author, Anatomy in a Competency-based Curriculum, presented at Experimental biology 2000, San Diego, Calif.

2000-01, Presented Cell Biology and Histology (A560) in an integrated approach for first-year medical students with Medical Physiology (P531, P532)

To date have served as Thesis Advisor and mentor for 17 graduate students, 3 post-doctoral fellows and approximately 30 undergraduate researchers

Author, 12th and 13th editions of ***Junqueira’s Basic Histology***, published by McGraw-Hill/Lange Professional Division and available in 10 languages as one of the top-selling histology textbooks throughout the world

**PROFESSIONAL SERVICE** at the Regional, National and International Level:

Advisory Board, U.S. Dept. of Veterans Affairs Office of Regeneration Research Programs, 1992-1998 (Chairman, 1996-1998)

Nominating Committee, American Society of Zoologists, Division of Developmental and Cellular Biology, 1988

Organizing Committee, International Conference on the Use of Axolotls and Other Urodeles in Research, September, 1993, Indianapolis, Indiana, with support from the National Science Foundation

Organizing Committees, 5th, 6th and 7th International Symposia on Neural Regeneration, December, 1993, 1995 and 1997, Pacific Grove, California, with support from the American Paralysis Assn., Veterans Administration, Paralyzed Veterans of America, the Alzheimer's Assn., and the National Institutes of Health

Co-organizer (with Anton Neff) and host of 1987 Midwest Regional Developmental Biology Conference, Bloomington, Indiana, with support from the National Science Foundation, the Society for Developmental Biology, and the American Society of Zoologists

Co-organizer (with 3 others) of a conference, Biocomplexity IV: Regenerative Biology and Medicine, held at IU Bloomington, May 14-18, 2003

Chairman of platform sessions at regional, national, and international scientific conferences in 1982, 1985, 1986, 1987, 1990, 1993, 1995 and 1997

Frequent reviewer of manuscripts for U.S. and foreign research journals, 1978-present

Ad hoc reviewer of grant proposals for U.S. and Canadian governmental agencies and various private foundations, 1980-present

Regular consultant for the radio program "A Moment of Science" produced by WFIU, Bloomington, for distribution to over 125 other public radio stations, 1991-present

Speaker at faculty retreat for Georgia Tech – Emory School of Medicine Consortium for Tissue Engineering (GTEC), August 15, 2009

Lead-off speaker at 10th International Congress of Neuroimmunology, ESNI Course European School of Neuroimmunology, Sitges, Spain, October 26-30, 2010

Basic Science Examination Task Force, National Board of Medical Examiners, Philadelphia, March 21-22, 2013

**UNIVERSITY SERVICE:**

IUSM Tenure and Promotion Committee, 2001 - present

IUSM Graduate Admissions Committee, 1997 – 2003

IUB Faculty Council Budgetary Affairs Committee, 2008 - present

Medical Sciences Executive Committee, 1994 - present

Medical Sciences Graduate Committee, 1983 - present

Medical Sciences Medical Education Committee, 1999 - present

Medical Sciences AI Advisory Committee, 1991 - present

Medical Sciences Undergraduate Education Committee, 1993 - 2002

Tenure and Promotion Committee, IUSM Evansville, 1997 - 2001

Faculty Advisory Board, MEDIC-B (Minority Education and Development Initiative for Careers in Biomedicine), 1998 – 2000

**RESEARCH GRANTS, FELLOWSHIPS AND AWARDS**: (Since 1990 only)

U.S. Army Medical Research and Development Command Grant, (DAMD17-91Z1002), $234,914, Nerves and Tissue Repair, December 1990 - January 9, 1994, P.I., 25% FTE (Competing renewal of DAMD17-87C7098)

Eli Lilly and Co. Contract, $82,000 Cellular Proliferation and Proportioning of Embryonic Muscle, July,1992 - June, 1993, Co-P.I.

IU School of Medicine Biomedical Research Support Grant, $7,500, Studies of Transferrin and Impaired Wound Healing in Mice, May 1, 1994 – Dec. 31, 1995, P.I.

Research contract with Johnson & Johnson, Inc., $9,930, The Microenvironment of Chronic Wounds, January 1, 1996 - December 31, 1996, P.I.

Eli Lilly and Co. Contract, $138,563 Regeneration Biology and Medicine: A Search for Regeneration-Stimulating Molecules in *Xenopus laevis*, July, 1999 - June, 2001, Co-P.I.

21st Century Fund of Indiana, $87,900, “Novel Approach to Stimulate Tissue and Organ Regeneration,” Jan., 2001 – Dec., 2002, Co-P.I.

National Science Foundation Partnerships for Innovation Grant: A Center for Excellence in Regenerative Biology and Medicine, $600,000, Oct., 2001 – Sept., 2003, Co-P.I.

Eli Lilly and Co. Contract renewal, $138,000 “Regenerative Biology and Medicine: A Search for regeneration-Stimulating Molecules in *X. laevis,*” May, 2001 – May, 2003, Co-P.I.

21st Century Fund of Indiana, Organ Regeneration, $225,000, July, 2004 – June 2007

IU School of Medicine Biomedical Research Grant, $40,000, “Ontogenic Decline of Regenerative Capacity in Amphibians,” April 1, 2007 – March 31, 2008.

National Science Foundation, $360,000, “Immunity and Ontogenic Decline of Regenerative Capacity in *Xenopus*” September 1, 2008 – August 31, 2012

**RESEARCH PUBLICATIONS (**Full papers only, no abstracts included)

1. Mescher, A. and T. Humphreys (1974). Activation of maternal mRNA in the absence of poly(A) formation in fertilized sea urchin eggs. *Nature* (London) 249: 138-139.

2. Mescher, A.L. and R.A. Tassava (1975). Denervation effects on DNA replication and mitosis during the initiation of limb regeneration in adult newts. *Developmental Biology* 44: 187-197.

3. Tassava, R.A. and A.L. Mescher (1975). The roles of injury, nerves and the wound epidermis during the initiation of amphibian limb regeneration. *Differentiation* 4: 23-24.

4. Mescher, A.L. (1976). Effects on adult newt limb regeneration of partial and complete skin flaps over the amputation surface. *Journal of Experimental Zoology* 195: 117-128.

5. Tassava, R.A. and A.L. Mescher (1976). Mitotic activity and nucleic acid precursor incorporation in denervated and innervated limb stumps of axolotl larvae. *Journal of Experimental Zoology* 195: 253-262.

6. Gospodarowicz, D., C.R. Ill, A.L. Mescher and J.S. Moran (1976). The control of proliferation of steroid-producing cells and endothelial cells by the fibroblast growth factor and the epidermal growth factor. In: *Endocrinology*, vol. 2 (V.H.T. James, ed.), pp. 196-205. Excerpta Medica, Amsterdam

7. Gospodarowicz, D., A.L. Mescher, and C.R. Birdwell (1977). Stimulation of corneal endothelial cell proliferation in vitro by fibroblast and epidermal growth factors. *Experimental Eye Research* 25: 75-89.

8. Gospodarowicz, D., A.L. Mescher, K.D. Brown and C.R. Birdwell (1977). The role of fibroblast growth factor and epidermal growth factor in the proliferative response of the corneal and lens epithelium. *Experimental Eye Research* 25: 631-649.

9. Gospodarowicz, D. and A.L. Mescher (1977). A comparison of the responses of cultured myoblasts and chondrocytes to fibroblast and epidermal growth factors. *Journal of Cellular Physiology* 93: 117-128.

10. Gospodarowicz, D., J.S. Moran and A.L. Mescher (1978). Cellular specifications of fibroblast growth factor and epidermal growth factor. In: *Molecular Control of Proliferation and Differentiation* (J. Papacon-stantinou and W. Rutter, eds.), pp. 33-63. Academic Press, New York.

11. Gospodarowicz, D., A.L. Mescher and C.R. Birdwell (1978). Control of cellular proliferation by the fibroblast and epidermal growth factors. *National Cancer Institute Monograph* 48: 109-130.

12. Mescher, A.L. and D. Gospodarowicz (1979). Mitogenic effect of a growth factor derived from myelin on denervated regenerates of newt forelimbs. *Journal of Experimental Zoology* 207: 497-503.

13. Gospodarowicz, D. and A.L. Mescher (1980). Fibroblast growth factor and the control of vertebrate regeneration and repair. *Annals of New York Academy of Science* 339: 151-174.

14. Gospodarowicz, D. and A.L. Mescher (1981). Fibroblast growth factor and vertebrate regeneration. *Advances in Neurology* 29: 149-171.

15. Mescher, A.L. and J.J. Loh (1981). Newt forelimb regeneration blastemas in vitro: cellular response to explantation and effects of various growth-promoting substances. *Journal of Experimental Zoology* 216: 235-245.

16. Yachnis, A.T. and A.L. Mescher (1982). Stimulation of DNA synthesis in Balb/c 3T3 cells by peripheral nerve degenerating in vitro. *Experimental Neurology* 76: 139-149.

17. Mescher, A.L. (1982). Neurotrophic control of events in injured forelimbs of larval urodeles. *Journal of Embryology and Experimental Morphology* 69: 183-192.

18. Mescher, A.L. (1983). Growth factors from nerves and their roles during limb regeneration. In: *Limb Development and Regeneration*, Part A (J.F. Fallon and A.I. Caplan, eds.), Alan R. Liss, Inc., New York, pp. 501-512.

19. Mescher, A.L. (1984). Injury to nerves and the initiation of amphibian limb regeneration. *American Journal of Anatomy* 169: 273-284.

20. Mescher, A.L. and S.I. Munaim (1984). "Trophic" effect of transferrin on amphibian limb regeneration blastemas. *Journal of Experimental Zoology* 230: 485-490.

21. Carlone, R.A. and A.L. Mescher (1985). Trophic factors from nerves. In: *Regulation of Vertebrate Limb Regeneration* (R. Sicard, ed.), Oxford University Press, New York, pp. 93-105.

22. Mescher, A.L. and S.I. Munaim (1986). Changes in the extracellular matrix and glycosaminoglycan synthesis during the initiation of regeneration in adult newt forelimbs. *Anatomical Record* 214: 424-434.

23. Munaim, S.I. and A.L. Mescher (1986). Transferrin and the trophic effect of neural tissue on amphibian limb regeneration blastemas. *Developmental Biology* 116: 138-142.

24. Mescher, A.L. and S.I. Munaim (1988). Transferrin and the growth-promoting effect of nerves. *International Review of Cytology* 110: 1-26.

25. Mescher, A.L., S.I. Munaim and C.A. Cox (1988) Neural influence on hyaluronic acid synthesis during limb regeneration. In: *Regeneration* *and Development* (S. Inoue et al., eds.) Okada Publishing Company, Maebashi, Japan, pp. 87-97.

26. Mescher, A.L. and C.A. Cox (1988) Hyaluronate accumulation and nerve-dependent growth during regeneration of larval *Ambystoma* limbs.  *Differentiation* 38: 161-168.

27. Mescher, A.L. and C.A. Cox (1989) Neural influence on the extracellular matrix during blastema formation. In: *Recent Trends in Regeneration Research* (V. Kiortis et al., eds.) NATO ASI Series A: Life Sciences, Vol. 172, Plenum Press, New York, pp. 207-216.

28. Tsonis, P. A., D. English and A. L. Mescher (1991) Increased content of inositol phosphates in amputated limbs of axolotl larvae, and the effect of beryllium.  *Journal of Experimental Zoology* 259: 252-258.

29. Kiffmeyer, W. R., E. V. Tomusk and A. L. Mescher (1991) Axonal transport and release of transferrin in nerves of regenerating amphibian limbs. *Developmental Biology* 147: 392-402.

30. Tsonis, P. A., A. L. Mescher and K. del Rio-Tsonis (1992) Protein synthesis in the newt regenerating limb: Comparative two-dimensional PAGE, computer analysis and protein sequencing. *Biochemical Journal* 281: 665-668.

31. Mescher, A. L. and W. R. Kiffmeyer (1992) Axonal release of transferrin in peripheral nerves of axolotls during regeneration. In: *Monographs in Developmental Biology*, vol. 23, *Keys for Regeneration* (C. H. Taban and B. Boilly, eds.) Basel: S. Karger; pp. 100-09.

32. Tsonis, P. A., C. H. Washabaugh, A. L. Mescher and K. del-Rio-Tsonis (1992) Gene expression during newt limb regeneration. In: *Monographs in Developmental Biology*, vol. 23, *Keys for Regeneration* (C. H. Taban and B. Boilly, eds.) Basel: S. Karger; pp. 131-38.

33. Mescher, A. L. (1992) Regeneration. In: *McGraw-Hill Encyclopedia of Science and Technology*. (7th ed.) McGraw-Hill Publishing Company, New York. Pp. 263-267.

34. Mescher, A. L. (1992) Trophic activity of regenerating peripheral nerves. *Comments on Developmental Neurobiology* 1: 373-90.

35. Mescher, A. L. (1993) Development and regeneration of limbs of the *short toes* axolotl mutant. In: *Limb Development and Regeneration* (J. Fallon et al., eds.) New York: Wiley-Liss, Inc. pp. 181-91.

36. Fuentes, E. J., A. L. Mescher, R. Ekman and P. A. Tsonis (1993) Expression of *Hydra* head activator in newt tissues and effects on limb regeneration. *In Vivo* 7: 59-64.

37. Ludolph, C.C., A.W. Neff, A.L. Mescher, G.M. Malacinski, M.A. Parker and R.C. Smith (1994) Overexpression of XMyoD and XMyf5 in *Xenopus* embryos induces the formation of enlarged myotomes through recruitment of cells of non-somitic lineage. *Developmental Biology* 166:18-33.

38. Ludolph, D.C., A.W. Neff, M.A. Parker, A.L. Mescher, R.C. Smith, and G.M. Malacinski (1995) Cloning and expression of the axolotl proto-oncogene ski. *Biochimica Biophysica Acta* 1260:102-04.

39. Sun, H.B., A.W. Neff, A.L. Mescher, and G.M. Malacinski (1995) Expression of the axolotl homologue of mouse chaperonin *t*-complex protein-1 during early development. *Biochimica Biophysica Acta*. 1260:157-66.

40. Mescher, A.L. (1996) The cellular basis of limb regeneration in urodeles. *Internat. J. Devel. Biol.* 40:785-796.

41. Mescher, A.L., E. Connell, C. Hsu, C. Patel, and B. Overton (1997) Transferrin is necessary and sufficient for the neural effect on growth in amphibian limb regeneration. *Develop. Growth Differ*. 39: 677-684.

42. Dinsmore, C.E. and A.L. Mescher (1998) The role of the nervous system in regeneration. In: *The Cellular and Molecular Basis of Regeneration: From Invertebrates to Humans.* P. Ferretti and J. Geraudie, eds.) Chichester, UK: John Wiley & Sons, pp. 79-108.

43. Mescher, A.L. (1999) Regeneration: Nerve-dependent and Nerve- independent. In: *Encyclopedia of Life Sciences*, Nature Publishing Group, London, [www.els.net](http://www.els.net)

44. Mescher, A.L., G.W. White, and J.J. Brokaw (2000) Apoptosis in regenerating and denervated, nonregenerating urodele forelimbs. *Wound Repair Regen*., 8:110-116.

45. Rageh, M.A.E., L. Mendenhall, E.E.A. Moussad, S.E. Abbey, A.L. Mescher, and R.A. Tassava (2002) Vasculature in Pre-blastema and nerve-dependent blastema stages of regenerating forelimbs of the adult newt, *Notophthalmus viridescens*. *J. Exp. Zool.* 292:255-266.

46. King, M.W., T. Nguyen, J. Calley, M.W. Harty, M.C. Muzinich, A.L. Mescher, C. Chalfant, M. N’Cho, K. McLeaster, J. McEntire, D. Stocum, R.C. Smith, and A.W. Neff. (2003) Identification of genes expressed during *Xenopus laevis* limb regeneration by using subtractive hybridization. *Devel. Dynamics* 226: 398-409.

1. Harty, M., A.W. Neff, M.W. King, and A.L. Mescher (2003) Regeneration or scarring: An immunologic perspective. *Devel. Dynamics* 226: 268-279.
2. Mescher, A.L. and A. W. Neff (2004) Loss of regenerative capacity: A trade-off for immune specificity? *Cellscience,* [www.cellscience.com](http://www.cellscience.com)
3. Mescher, A.L. and A.W. Neff (2005) Regenerative capacity and the developing immune system. In: *Regenerative Medicine*. I.V. Yannas, ed. Heidelberg: Springer Verlag, *Adv. Biochem. Engin./Biotechnol*. 93: 39-66.
4. Mescher, A.L. (2005) Regenerative biology. In: *AccessScience @McGraw-Hill* [www.accessscience.com](http://www.accessscience.com)
5. Neff, A.W., M. W. King, M. W. Harty, J. Calley, R. C. Smith, and A. L. Mescher (2005) Expression of *Xenopus* XlSALL4 during limb development and regeneration. *Devel. Dynamics* 233: 356-67.
6. Mescher, A.L. and A. W. Neff (2006) Limb regeneration in amphibians: Immunological considerations. *TheScientificWorldJOURNAL* (2006) 6(S1), 1-11
7. Grow, M., A. W. Neff, A.L. Mescher, and M. K. King (2006) Global analysis of gene expression in *Xenopus* hindlimbs during stage-dependent complete and incomplete regeneration. *Devel. Dynamics* 235: 2667-85.
8. Mescher, A.L., W.L. Wolf, E.A. Moseman, B. Hartman, C. Harrison, E. Nguyen, and A.W. Neff (2007) Cells of cutaneous immunity in *Xenopus*: Studies during larval development and limb regeneration. *Devel. Comp. Immunol.* 31:383-93.
9. Werner, S.R., A.L. Mescher, A.W. Neff, M.K. King, M.W. Harty, and R.C. Smith (2007) Neural MMP-28 expression precedes myelination during development and peripheral nerve repair. *Devel. Dynamics* 236: 2852-64
10. Mescher, A. L. (2008) *Human Tissue Biology Laboratory Guide. Tichenor* Publishing, Bloomington, 134 pp.
11. King, M.W., A.W. Neff, and A.L. Mescher (2009) Proteomics analysis of regenerating amphibian limbs: Changes during the onset of regeneration. *Internat. J. Devel. Biol.* 53: 955-969.
12. Mescher, A. L. (2010) Nerve-dependent tissue and organ regeneration. *Encyclopedia of Life Sciences*, John Wiley & Sons, London.

59. Wilson, J.M., R. I. Martinez-De Luna, H. M. El Hodiri, R. Smith, M. W. King, A. L. Mescher, A. W. Neff, and T. L. Belecky-Adams (2010) [RNA helicase Ddx39 is expressed in the developing central nervous system, limb, otic vesicle, branchial arches and facial mesenchyme of Xenopus laevis](http://mail.elsevier-alerts.com/go.asp?/bESJ001/mBGNFJ1F/q2GEFJ1F/u9C7E5/xZUUGJ1F/cutf%2D8). *Gene Expression Patterns* 10: 44-52.

60. Mescher, A. L. (2010) *Junqueira’s Basic Histology*, 12th edition. McGraw-Hill/Lange Professional Division, New York, 467 pages.

61. Mescher, A. L. (2011) *Basic Histology Flash Cards*, McGraw-Hill/Lange Professional Division, New York, 400 pages.

62. Neff, A.W., M. W. King, and A. L. Mescher (2011) Dedifferentiation and the role of Sall4 in reprogramming and patterning during amphibian limb regeneration. *Devel. Dynam.* 240: 979-989.

63. King, M. W., A. W. Neff, and A. L. Mescher (2012) The developing *Xenopus* limb as a model for studies on the balance between inflammation and regeneration. *Anatomical Record* 295: 1552-1561.

64. Mescher, A. L. (2013) *Junqueira’s Basic Histology*, 13th edition. McGraw-Hill/Lange Professional Division, New York, 525 pages.

65. Mescher, A.L., A.W. Neff, and M.W. King (2013) Changes in the inflammatory response to injury and its resolution during the loss of regenerative capacity in developing *Xenopus* limbs. *PLoS ONE* 8: e80477.

66. Mescher, A. L. (2015) *Junqueira’s Basic Histology*, 14th edition. McGraw-Hill/Lange Education, New York, 560 pages.

67. Mescher, A. L., M. W. King, and A. W. Neff. (2016) Inflammation and immunity in organ regeneration. *Devel. Comp. Immunol.* (In press)

68. Mescher, A. L. (2016) *Limb Regeneration.* Elsevier Reference Modules in Biomedical Sciences. (in preparation)