

Michael E. White

Professor

Appointment 65% Research, 30% Teaching, 5% Service

Research Area Muscle Growth Biology, Muscle Cell Biology

Appointment History

1998-present	Professor
1993-1998	Associate Professor
1992-1993	Assistant Professor

Graduate Program Affiliations

Animal Sciences – Senior Member

Professional and Honorary Societies

Member, American Society of Animal Science
Member, Phi Kappa Phi
Member, Gamma Sigma Delta
Member, Sigma Xi
Member, American Association for the Advancement of Science
Member, The Ohio Academy of Science
Member, American Institute of Nutrition, past member
Member, Sterlings Who's Who
Member, Who's Who in Science and Engineering

Five Most Significant Publications

Kamanga-Sollo, E., M.S. Pampusch, G. Xi, M.E. White, M.R. Hathaway, and W.R. Dayton. 2004. IGF-I mRNA levels in bovine satellite cell cultures: Effects of fusion and anabolic steroid treatment. *J. Cell. Physiol.* In Press.

This paper is the first to demonstrate that both estradiol-17-beta (E2) and Trenbolone act directly to increase IGF-I mRNA level in cultured bovine muscle satellite cells. Furthermore, it demonstrates that E2 can increase the rate of DNA synthesis or proliferation rate in these cells. These findings support our hypothesis that an important mechanism of action of anabolic steroid-induced muscle growth is increased muscle IGF-I mRNA resulting in increase local IGF-I concentrations that stimulate muscle and satellite cell growth.

Kamanga-Sollo, E., M.S. Pampusch, M.E. White, and W.R. Dayton. 2003. Role of insulin-like growth factor binding protein (IGFBP)-3 in TGF-beta- and GDF-8 (myostatin)-induced suppression of proliferation in porcine embryonic myogenic cell cultures. *J. Cell. Physiol.* 197(2):225-31.

This paper demonstrates that IGFBP-3 mediates the actions of TGF-beta and Myostatin (GDF-8) in porcine embryonic myoblast (PEM) growth in culture. This further supports our hypotheses that IGFBP-3 is involved in the regulation of proliferation and differentiation in myogenic cells.

Pampusch, M.S., E. Kamanga-Sollo, M.E. White, M.R. Hathaway, and W.R. Dayton. 2003. Effect of recombinant porcine IGF-binding protein-3 on proliferation of embryonic porcine myogenic cell cultures in the presence and absence of IGF-I. *J. Endocrinol.* 176(2):227-35.

This paper describes the production and purification of porcine recombinant IGFBP-3 (rpIGFBP-3) and the production and characterization of a blocking antibody against rpIGFBP-3.

Furthermore, we demonstrate here that rpIGFBP-3 possesses IGF-Dependent and IGF-Independent effects on PEM proliferation and differentiation and adds further support to our hypothesis that IGFBP-3 plays a fundamentally important role in muscle growth and development.

Pampusch, M.S., B.J. Johnson, M.E. White, M.R. Hathaway, J.D. Dunn, A.T. Waylan, and W.R. Dayton. 2003. Time course of changes in growth factor mRNA levels in muscle of steroid-implanted and nonimplanted steers. *J. Anim. Sci.* 2003 81(11):2733-40.

This study demonstrated that a combine anabolic steroid implant containing E2 and Trenbolone acetate significantly elevated muscle IGF-I mRNA within 7 days of steroid treatment. The time frame of the steroid-induced muscle IGF-I mRNA coincided with previously measure increases in steroid-induce muscle deposition and strongly supports our hypothesis that steroid-induced increases in local production of muscle IGF-I mRNA are a major mechanism of action of steroid-induce muscle growth.

Johnson, B.J., M.E. White, M.R. Hathaway, and W.R. Dayton. 1999. Decreased steady-state insulin-like growth factor binding protein-3 (IGFBP-3) mRNA level is associated with differentiation of cultured porcine myogenic cells. *J. Cell. Physiol.* 179(2):237-43.

This paper was the first to indicate that IGFBP-3 may play a role in the differentiation of porcine embryonic myoblasts. The results from this study lead to the development of our hypothesis that IGFBP-3 plays an important role in the proliferation and differentiation of muscle cells in meat animals.

Johnson, B.J., M.E. White, M.R. Hathaway, C.J. Christians, and W.R. Dayton. 1998. Effect of a combined trenbolone acetate and estradiol implant on steady-state IGF-I mRNA concentrations in the liver of wethers and the longissimus muscle of steers. *J. Anim. Sci.* 76(2):491-7.

This paper was the first to demonstrated that a combine anabolic steroid implant containing E2 and Trenbolone acetate significantly elevated muscle IGF-I mRNA levels in beef and sheep. The findings from this study lead the development of our hypotheses that anabolic steroid-induced increases in local production of muscle IGF-I are a major mechanism of action of steroid-induce muscle growth.

Refereed Journal Publications and Book Chapters (Last Five Years)

Authored or co-authored the following 16 papers in peer-reviewed journals.

Kamanga-Sollo, E., M.S. Pampusch, G. Xi, **M.E. White**, M.R. Hathaway, and W.R. Dayton. 2004. IGF-I mRNA levels in bovine satellite cell cultures: Effects of fusion and anabolic steroid treatment. *J. Cell. Physiol.* In Press.

Xi, G., E. Kamanga-Sollo, M.S. Pampusch, **M.E. White**, M. . Hathaway, and W.R. Dayton. 2004. Effect of recombinant porcine IGFBP-3 on IGF-I and Long-R3-IGF-I-stimulated proliferation and differentiation of L6 myogenic cells. *J. Cell. Physiol.* 200(3):387-94.

Kamanga-Sollo, E., M.S. Pampusch, **M.E. White**, and W.R. Dayton. 2003. Role of insulin-like growth factor binding protein (IGFBP)-3 in TGF-beta- and GDF-8 (myostatin)-induced suppression of proliferation in porcine embryonic myogenic cell cultures. *J. Cell. Physiol.* 197(2):225-31.

Hathaway, M.R., W.R. Dayton, **M.E. White**, and M.S. Pampusch. 2003. Effects of antimicrobials and weaning on porcine serum insulin-like growth factor binding protein levels. *J. Anim. Sci.* 81(6):1456-63.

White, M.E., B.J. Johnson, M.R. Hathaway, and W.R. Dayton. 2003. Growth factor mRNA levels in muscle and liver of steroid-implanted and non-implanted steers. *J. Anim. Sci.* 81:965-972.

- Pampusch, M.S., E. Kamanga-Sollo, **M.E. White**, M.R. Hathaway, and W.R. Dayton. 2003. Effect of recombinant porcine IGF-binding protein-3 on proliferation of embryonic porcine myogenic cell cultures in the presence and absence of IGF-I. *J. Endocrinol.* 176(2):227-35.
- Johnson, B.J., **M.E. White**, M.R. Hathaway, and W.R. Dayton. 2003. Effect of differentiation on levels of insulin-like growth factor binding protein mRNAs in cultured porcine embryonic myogenic cells. *Domest. Anim. Endocrinol.* 24(1):81-93.
- Yi, Z., M. Hathaway, W. Dayton, and **M.E. White**. 2001. Effect of growth factors on insulin-like growth factor binding proteins in media conditioned by primary porcine satellite cells. *J. Anim. Sci.* 79:2820-2826.
- Ramsay, T.G. and **M.E. White**. 2000. Insulin regulation of leptin expression in streptozotocin diabetic pigs. *J. Anim. Sci.* 78(6):1497-503.
- Yang, H., J.E. Pettigrew, L.J. Johnston, G.C. Shurson, J.E. Wheaton, **M.E. White**, Y. Koketsu, A.F. Sower, and J.A. Rathmacher. 2000. Effects of dietary lysine intake during lactation on blood metabolites, hormones, and reproductive performance in primiparous sows. *J. Anim. Sci.* 78(4):1001-9.
- Yang, F., B.J. Johnson, **M.E. White**, M.R. Hathaway, and W.R. Dayton. 1999. Effect of insulin-like growth factor (IGF)-I and Des (1,3) IGF-I on the level of IGF binding Protein-3 and IGF binding Protein-3 mRNA in cultured porcine embryonic muscle cells. *J. Cell. Physiol.* 178: 227-234.
- Johnson, B.J., **M.E. White**, M.R. Hathaway, and W.R. Dayton. 1999. Decreased steady-state insulin-like growth factor binding protein-3 (IGFBP-3) mRNA level is associated with differentiation of cultured porcine myogenic cells. *J. Cell. Physiol.* 179(2):237-43.
- White, M.E.**, M.R. Hathaway, W.R. Dayton, T. Henderson, and A.J. Lepine. 1999. Comparison of insulin-like growth factor-I concentration in mammary secretions and serum of small- and giant-breed dogs. *Am. J. Vet. Res.* 60(9):1088-91.
- Hathaway, M.R., W.R. Dayton, **M.E. White**, T.L. Henderson D. Young, and T. Doan. 1999. Antimicrobial-induced increases in serum insulin-like growth factor-I (IGF-I) concentrations are not the result of increased voluntary feed intake. *J. Anim. Sci.* 77:3208-3214.
- Kusina, J., J.E. Pettigrew, A.F. Sower, **M.E. White**, B.A. Crooker, and M.R. Hathaway. 1999. Effect of protein intake during gestation and lactation on the lactational performance of primiparous sows. *J. Anim. Sci.* 22(4) 925-941.
- Kusina, J., J.E. Pettigrew, A.F. Sower, M.R. Hathaway, **M.E. White**, and B.A. Crooker. 1999. Effect of protein intake during gestation on mammary development of primiparous sows. *J. Anim. Sci.* 77 (4): 917-924.

Awards

2001 COAFES Outstanding Teacher

Invited Lectures

Panel Speaker, Busch Excellence in Teaching Program, The New Professoriate. 2004.

IGFs and Muscle Growth. Animal Growth and Development Symposium. FASEB. 1999. Washington, D.C.

IGFs and Cytokines in Swine Growth and Health. 1999. Biotechnology Research and Development Corporation. Ames, IA.

Funding (Last Five Years) – \$145,000

USDA-NRI: Animal Growth, Development and Nutrient Utilization. Role of IGFBP-3 and -5 in porcine muscle development. W. Dayton (PI). 2000-04. \$210,000.

USDA-NRI Competitive Grants Program: Animal Growth, Development and Nutrient Utilization. Role of satellite cell activation and growth factors in anabolic steroid-induced muscle growth of steers. W. Dayton (PI). 1999-04. \$182,000.

National Pork Board. Alternative strategies of utilizing antimicrobials as growth promotants. sota M. Hathaway (PI). 2001-03. \$50,000.

Biotechnology Research and Development Corporation. IGFs and Cytokines in swine growth and health. 1999-01. \$90,000.

USDA-NRI: Animal Growth, Development and Nutrient Utilization. Insulin-like growth factor binding protein production by porcine myogenic cells. W. Dayton (PI). 1997-00. \$180,000.

MPPA. Effect of antimicrobial supplementation on satellite cell responsiveness to growth factors. 1997-99. \$15,000.

Biotechnology Research and Development Corporation. IGFs and Cytokines in swine growth and health. 1998-99. \$55,000.

Dissertations and Theses (Last Five Years)

Zhilan Yi, 1999. Thesis Topic: Effect of growth factors on insulin-like growth factor binding proteins in media conditioned by primary porcine satellite cells.

Graduate Student and Post-doctoral Supervision - Current Advisees

Ernest I. Kamanga-Sollo (co-supervise)	Post-doc/scientist	
Mary Pampusch (co-supervise)	Post-doc/scientist	
Melvin Pagan (co-supervise)	Post-doc	
Xi Gang (co-supervise)	PhD. Candidate	Animal Sciences

Courses Taught (Last Five Years)

Designator	Name	Cr	% Effort	Term	Years
AnSc 3203	Env, Global Food Prod, & the Citizen	3	100%	Spring	2000-2004
AnSc 3511	Animal Growth & Development	3	33%	Spring	2000-2004

Guest Lectures:

An Sc 2401: Animal Nutrition: Nutrition and Growth, 1 lecture

An Sc 4103: World Food Problems, 3 hours (1 week), 70 students

Service

Board of Directors Selection Committee MISA

USDA CREES Review Team Member, Iowa State Univ., Department of Animal Science

Reviewer, USDA NRI, Improving Animal Growth and Development Grant Proposals,

Editorial Board, *Journal of Animal Science*, Growth and Development Section

Reviewer, *J. Nutrition*, *Endocrinology*, *Journal of Natural Resources and Life Sciences Education*,
Domestic Animal Endocrinology, *Biochemical Genetics*

Chair, Animal Growth, Meat Science & Muscle Biology Comm. ASAS/ADSA Midwest

MISA bylaws committee

Member, Executive Board, Global Event Planning Committee

International Assignment, Morocco Task Force

Panel Member USDA NRI Improving Animal Growth and Development, 2002

Panel Speaker, Busch Excellence in Teaching Program, The New Professoriate

Midwest ASAS/ADSA Outstanding Research Award Committee

Presidents Distinguished Faculty Mentor Program

Board of Directors, Minnesota Institute for Sustainable Agriculture

Faculty Mentor for Minority Scholars Development Program

Service to National and Regional Research Committees

Member, NC-131 Technical Committee – Factor Regulating Protein Synthesis, Degradation and Growth in Skeletal Muscle

Extension Reports

Dayton, W.R., B.J. Johnson, **M.E. White**, and M.R. Hathaway. 1999. Effect of anabolic steroid implantation on muscle growth in feedlot steers. 1999 Minnesota Cattle Feeder Report.