

## Anne Auriemma Grippo

(870)972-3493

agrippo@astate.edu

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### Current Position

Position Title: Associate Dean, College of Science & Mathematics  
Professor of Biological Sciences

Current Academic Rank: Professor

Rank Since: Fall 2013

### Degrees

- Ph D                    Medicinal Chemistry: , University of North Carolina at Chapel Hill, Chapel Hill, NJ 1987  
Dissertation: Sesquiterpene lactones: Mechanism of antitumor activity, relationship of cellular glutathione to cytotoxicity, and disposition
- BS                      Chemistry: Biology, Fairleigh Dickinson University, Madison, NJ 1978

### Scholarly Contributions and Creative Productions

#### Grants

##### *Completed/Published*

Grippo, A., & Pearce, A. (2011). Radioactive! Scientists & Artists Celebrate Marie Curie's Legacy. AR Community Foundation - 5700.

Grippo, A., Kennon, J.T., Hall, J., Engelken, R., Yanowitz, K., & Trautwein, J. (2009). Creating STEM Teachers for Arkansas' Future. NSF - 899988.    complete 6/14

Grippo, A., & Devareddy, L. (2009). Plant-based anti-inflammatory agents may reduce the risk of chronic inflammatory diseases.. NSF EPSCOR - 107964.

Christian, A., Hannigan, R., Grippo, A., Kennon, J.T., Miller, C., & Hall, J. (2008). GK12: Environmental Sciences and Molecular Biosciences in the Natural State. Arkansas State University - 2242565.

Bouldin, J., Grippo, A., Kennon, J.T., Miller, C.A., & Hall, J. (2008). GK12: Environmental Sciences and Molecular Biosciences in the Natural State.. NSF Division of Graduate Education - 2242556.

Grippo, A., & Buchanan, R. (2005). Neurophysiological and neuroendocrinological changes with the estrous cycle. NIH - 24920.

## Journal Publications

### *Completed/Published*

~~Brown, C.E., Trauth, S., Grippo, R., Gurley, B.J., & Grippo, A. (2012). Combined Effects of Ephedrine Containing Dietary Supplements, Caffeine, and Nicotine on Morphology and Ultrastructure of Rat Hearts. Toxicology.~~

~~Brown, C., Grippo, A., Trauth, S., Grippo, R., & Gurley, B. (2012). Combined Effects of Ephedrine Containing Dietary Supplements, Caffeine, and Nicotine on Morphology and Ultrastructure of Rat Hearts. Toxicological Sciences.~~

Kennon, J.T., Vaughan IV, G.L., Bouldin, J., Grippo, A.A. (2013) Simple toxicity testing utilizing Daphnia spp. and table salt. Science Scope. 36(8):28-36

Brown, C.E., Trauth S., Grippo, R.S., Gurley B.J., Grippo, A.A. (2012) Combined effects of ephedrine-containing dietary supplements, caffeine, and nicotine on morphology and ultrastructure of rat hearts. J Caff Res. 2(3):123-132.

Shannon, J., Shannon, J., Modelevsky S., Grippo A.A. (2011) Bisphosphonates and osteonecrosis of the jaw. Amer. J. Ger. Pharmacother. J Am Geriatr Soc 59(12):2350–2355.

Grippo, A.A., Capps, K., Rougeau, B., Gurley, B.J. (2007) Analysis of flavonoid phytoestrogens in botanical and ephedra-containing dietary supplements. Ann. Pharmacother. 41:1375-82.

Grippo, A.A., B Hamilton B., R Hannigan R., BJ Gurley, B.J. (2006) Metal content of ephedra-containing dietary supplements and other select botanicals. Am. J. Health Syst. Pharm. 63:635-644.

Grippo, A.A., Luo, Y., Rougeau, B., Wyatt, W.V.. 2000. HPLC analysis of mono-saccharides in whole and regional, staged bovine oviductal fluid. Theriogenology. 35:717-721.

Grippo, A.A., Xie, Y., Rougeau, B., Wyatt, W.V. (1999) Analysis of phytoestrogens by high pressure liquid chromatography. J. AR Acad. Sci. 53:61-66.

Grippo, A.A., Way, A.L., Killian, G.J. (1995) Effect of bovine ampullary and isthmic oviductal fluid on motility, acrosome reaction and fertility of bull spermatozoa. J. Reprod. Fertil. 105:57-64.

Grippo, A.A., Anderson, S. H., Henault, M.A., Killian, G.J. (1994) Cholesterol, phospholipid and phosphor-lipase activity of ampullary and isthmic fluid from the bovine oviduct. J. Reprod. Fertil. 102:87-93.

Grippe, A.A., Henault, M.A., Anderson, S.H., Killian, G.J. (1992) Cation concentrations in fluid from the oviduct ampulla and isthmus of cows during the estrous cycle. *J. Dairy Sci.* 75:58-65.

Kavanaugh, J.F., Grippe, A.A., Killian, G.J. (1992) Cannulation of the bovine ampullary and isthmus oviduct. *J. Invest. Surg.* 5:11-17.

Grippe, A.A., Hall, I.H., Kiyokawa, H., Muraoka, O., Shen, Y-C., Lee, K.H. (1992) The cytotoxicity of helenalin, its mono and difunctional esters, and related sesquiterpene lactones in murine and human tumor cells. *Drug Design Disc.* 8:191-206.

Grippe, A.A., Wyrick, S.D., Lee, K.H., Shrewsbury, R.P., Hall, I.H. (1991) Disposition of an antineoplastic sesquiterpene lactone, [3H]-plenolin, in BDF1 mice. *Planta Med.* 7:299-314.

Hall, I.H., Grippe A.A., Holbrook, D.J., Chang, J.J., Yang, L.M., Chaney, S.G., Lee, K.H. (1990) Renal, hepatic, cardiac and thymic acute toxicity afforded by bis(helenaliny) malonate in BDF1 mice. *Toxicology* 65:205-216.

Hall, I.H., Grippe, A.A., Holbrook, D.J., Roberts, G.B., Lin, H.C., Kim, H.L., Lee, K.H. 1989. Role of thiol agents in protecting against the toxicity of helenalin in tumor-bearing mice. *Planta Med.* 5:513-517.

Wedler, F.C., BW Ley, B.W., Grippe, A.A. (1989) Manganese (II) dynamics and distribution in glial cells cultured from chick cerebral cortex. *Neurochem. Res.* 14:1129-1135.

Tholey, G., Ledig, M., Kopp, P., Sargentini-Maier, L., Leroy, M., Grippe, A.A., FC Wedler, F.C. (1988) Levels and subcellular distribution of physiologically important metal ions in neuronal cells cultured from chick embryo cerebral cortex. *Neurochem. Res.* 13:1163-1167.

Tholey, G., Ledig, M., Mandel, P., Sargentini, L., Frivole, A.H., Leroy, M., Grippe, A.A., Wedler, F.C. (1988) Concentrations of physiologically important metal ions in glial cells cultured from chick cerebral cortex. *Neurochem. Res.* 13:45-50.

Williams, W.L., Hall, I.H., Grippe, A.A., Oswald, C.B., Lee, K.H., Holbrook, D., Chaney, S. (1988) Inhibition of nucleic acid synthesis in P-388 lymphocytic leukemia tumor cells by helenalin and bis(helenaliny) malonate in vivo. *J. Pharm. Sci.* 77:178-184.

Chapman, D.E., Roberts, G.B., Reynolds, D.J., Grippe, A.A., Holbrook, D.J., Hall, I.H., Chaney, S.G., Chang, J., Lee, K.H.

(1988) Acute toxicity of helenalin in BDF1 mice. *Fund. App. Toxicology* 10:302-312.

Hall, I.H., Williams, Jr., W.L., Grippo, A.A., Lee, K.H., Holbrook, D.J., Chaney, S.G. (1988) Inhibition of nucleic acid synthesis in P-388 lymphocytic leukemia cells in culture by sesquiterpene lactones. *Anticancer Res.* 8:33-42.

Wyrick, S.D., Smith, F.T., Kemp, W.E., Grippo, A.A. (1987) Effects of [(N-alkyl-1H,3H-isoindolin-1,3-dione-5-yl)oxy]-alkanoic acids, [(N-alkyl-1H,3H-isoindolin-1-one-5-yl)oxy]-butanoic acids and related derivatives on chloride influx in primary astroglial cultures. *J. Medicinal Chem.* 30:1798-1806.

Hall, I.H., Grippo, A.A., Lee, K.H., Chaney, S.G., Holbrook, D. J. 1987. Effect of helenalin and bis(helenaliny) malonate on nucleic acid and protein synthesis in human KB carcinoma cells. *Pharm. Res.* 4:509-515.

### **Presentations**

Kennon, J.T., Grippo, A.A. (2013) A Fun Real-World Experiment Testing Different Sunscreens. National Science Teachers Association 2013 STEM Forum & Expo.

Freeman-Nelson, K., Grippo, A.A., Kennon, J.T. (2013) Put up your dukes! A hands-on lesson on plant defenses. NSF Noyce National Conference

Kennon, J.T., Hall, J.M., Bouldin, J.L., Yanowitz, K., Engelken, B.D., Grippo, A.A. (2012) Introducing Toxicity Testing to Mid- to High School Level Students: A Fun Teaching Activity Using *Daphnia*. Society of Environmental Toxicology & Chemistry International Conference

Yanowitz, K.L., Grippo, A.A., Hall, J.M., Kennon, J.T. (2012) Try out the Classroom: Creating STEM Teachers for Arkansas' Future. NSF Noyce Regional Conference

Grippo, A.A., Hall, J.M., Kennon, J.T., Cobb, M. (2012) C-STAF: Creating STEM teachers for Arkansas' future. NSF Noyce National Conference (2012)

Bouldin, J.L., Yanowitz, K.L., Miller, C.A., Grippo, A.A., Kennon, J.T. (2012) Graduate fellows at Arkansas State University enhance science curriculum in the Arkansas Delta. NSF GK-12 National Conference

Guthrey, C., Parr, R., Smith, D., Devareddy, L., Grippo, A. (2012) Effect of blueberry diet on inflammation in ovariectomized rats. Create@State Arkansas State University

Kennon, J.T., Grippo, A., Hall, J., Freeman-Nelson, K., Earhart, A., Collins, C. (2011). A fun real-world experiment testing different sunscreens. Arkansas Curriculum Conference.

Montalvo, B., McMickle, A., Weathers, P., Grippo, A. (2011). Antimalarial drug availability from artemisinin-enriched leaves from *Artemisia annua*. AR INBRE Research Conference.

Bouldin, J., Yanowitz, K.L., Miller, C.A., Grippo, A., Kennon, J.T. (2011). Arkansas State University graduate students enhance communication skills and science education in the Arkansas Delta. NSF GK12 Annual Meeting.

Lovelace, A., Pearce, A., Srivatsan, M., Grippo, A. (2011). Bioprotection from beetles: Investigating the untapped secrets of the neem tree. Create@State.

Grippo, A., Kennon, J.T., Hall, J., Engelken, R., Yanowitz, K., Bouldin, J. (2011). Creating STEM Teachers for Arkansas' future by designing an environmental science outreach activity. Mid-South SETAC Regional Meeting.

Guthrey, C., Parr, R., Devareddy, L., Grippo, A. (2011). Effect of blueberry diet on inflammation in ovariectomized rats. AR INBRE Research Conference.

Bouldin, J., Yanowitz, K.L., Miller, C.A., Grippo, A., Kennon, J.T. (2011). Enhanced environmental education in middle school classrooms by graduate students in the Arkansas Delta. MidSouth Society of Environmental Toxicology and Chemistry Annual Meeting.

Bouldin, J., Yanowitz, K.L., Miller, C.A., Grippo, A., Kennon, J.T. (2011). Enhanced environmental education in middle school classrooms by graduate students in the Arkansas Delta. North American Benthological Society Annual Meeting.

Kennon, J.T., Miller, C., Wynia, A., Bouldin, J., Grippo, A. (2011). Fun hands-on environmental science activities for middle grades. Arkansas Curriculum Conference.

Montalvo, B., McMickle, A., Ryan, A., Grippo, A. (2011). The role of red food dye in allergic inflammation. Create@State.

Kennon, J.T., Grippo, A., Hall, J., Stewart, J., Prince, L., Haagenson, K., Skelton, C., Kennon, M.E., Holton, D., Vaughan, G. (2010). A fun environmental science experiment using water fleas. Arkansas Curriculum Conference 2010.

Grippo, A., Kennon, J.T., Hall, J., Engelken, R., Yanowitz, K., Trautwein, J., Bouldin, J. (2010). C-STAF: Creating STEM Teachers for Arkansas' Future. Noyce National Conference.

Bouldin, J., Yanowitz, K.L., Miller, C.A., Grippo, A., Kennon, J.T. (2010). Pedagogy by graduate students enhance communication skills and science education in the Arkansas Delta. Society of Environmental Toxicology & Chemistry North America annual meeting.

Bouldin, J., Sappington, D.R., Yanowitz, K.L., Grippo, A., Miller, C.A., Kennon, J.T. (2009). Enhancing middle school science education in the Arkansas rural schools by Environmental Sciences and Molecular Biosciences graduate students. SETAC North America Meeting.

Kennon, J.T., Miller, C., Grippo, A., Hall, J., McKie, A., Schirmer, S. (2009). GK12: Environmental & molecular biosciences in the Natural State. Arkansas Curriculum Conference 2009.

Grippo, A. (2009). Plant Based Antiinflammatory Agents May Reduce the Risk of Chronic Inflammatory Diseases. AR EPSCoR P3 Conference.

Grippo, A., Ratti, A. (2008). Early cardiovascular changes with estrogen depletion. ASU Graduate Scholars Day.

Grippo, A., Ratti, A., Hill, B. (2008). Early cardiovascular changes with estrogen depletion. 90th Meeting of Endocrine Society.

Ratti, A., Grippo, A., Hill, B. (2007). Estrogen depletion: physiological and cardiovascular changes. Fall Research Symposium.

Spulecki, S., Condori, J., Shelton, K., Grippo, A., Medina-Bolivar, F. (2007). Resveratrol and resveratrol derivatives produced from peanut hairy roots. 21st National Conference on Undergraduate Research.

Grippo, A.A., Brown, C., Trauth, S., Grippo, R., Gurley, B. (L2006) Metabolife and Its Constituents Increase Atypical Cardiac Cells, An Effect Exacerbated by Nicotine. Soc. Toxicol.

B Gurley, B., Gardner, S.F., Williams, K., Grippo, A. (2006) Hemodynamic and electrocardiographic effects of an "Ephedra-free" dietary supplement (Metabolife Ultra™). Am. Soc. Clin. Pharmacol. Ther.

Brown, C., MacFarland, P., Trauth, S., Grippo, R., Grippo, A. (2005) Cardiovascular effects of combined nicotine and ephedra on male and female rats. SCC Soc. Toxicol.

Grippo, A.A., Snipes, S., Raeven, R., Kennedy, W., Humphrey, W. (2005) Genistein effects on sheep reproduction. Invited lecture: Southern. Assoc. Agric. Sci.

Grippo, A.A., Stokes, A.A., Brown, C.E., Rosa, L., Mary, M., Grippo, R.S., Trauth, S., Gurley, B.J. (2004) Does ephedra alone effect rat cardiovascular physiology and tissue morphology differently than ephedra contained in Metabolife? AR Biotech. Inst. Symposium

Grippo, A.A., S Snipes, S., A Davis, A., W Humphrey, W. (2004) Detection of genistein in serum and oviductal fluid of ewes administered Biochanin A. Biol. Reprod. 64 (Suppl. 1):89

Grippo, A.A. (2003) Studies of the effects of phytoestrogens on mammalian reproduction. Invited lecture: University of Memphis Biology Seminar Series

Capps, K., Rougeau, B., Gurley, B., Grippo, A. (2003) Bioflavonoids in herbal supplements. Southern Regional Discussion Group, Amer. Assoc. Pharm. Sci.

Hamilton, B.T., Hannigan, R.E., Gurley, B.J., Grippo, A.A. (2003) Metals concentrations in over-the-counter herbal preparations. Southern Regional Discussion Group, Amer. Assoc. Pharm. Sci.

Grippo, A.A. (2001) Reproductive toxicology of phytoestrogens. Invited lecture: UC Davis Toxicology Seminar Series

Bryant, W.D., Humphrey, W., Grippo, A.A. (2000) The effect of estrogenic agents on ram sperm acrosome reaction. 21<sup>st</sup> Annual Meeting, Soc. Env. Tox. & Chem.

Luo, Y., Rougeau, B., Wyatt, W., Grippo, A. (1999) Availability of monosaccharides in whole and regional, staged bovine oviductal fluid. Biol. Reprod. 60 (Suppl. 1):158

Grippo, A.A., Xie, Y., Rougeau, B., Wyatt, W.V. (1999) Analysis of phytoestrogens by high pressure liquid chromatography. Proc. AR Acad Sci.: 92

Hayes, W., Pierce, J., Farris, J., Grippo, A. (1998) Vitellogenin purification from the slider turtle *Trachemys scripta*. Proc. AR Acad. Sci.:18

Strecker, A., Grippo, A. (1998) Displacement of steroid hormones from sex hormone binding globulin by phytoestrogens. Proc. AR Acad. Sci.:36 (1998)

Winchester, E., Farris, J., Grippo, A., Grippo, R. (1997) Effects of aldicarb on cholinesterase activity of two freshwater molluscs (*Ligumia subrostrata* and *Corbicula fluminea*). Soc. Env. Tox. & Chem.

Killian, G.J., Grippo, A.A. (1992) Incubation in ampullary oviductal fluid improves the ability of sperm to fertilize bovine oocytes in vitro. Proc. of the 12th Int. Congress on Animal Repro. 2:650-652

Henault, M.A., Way, A.L., Grippo, A.A., Killian, G.J. (1992) A heterospermic, competitive penetration assay utilizing zona-free bovine oocytes. Biol. of Reprod. 46(Suppl. 1):74

King, R.S., Grippo, A.A., Killian, G.J. (1991) Bovine estrus-associated protein stimulates capacitation of bull sperm. *Biol. of Reprod.* 44(Suppl. 1):135

Grippo, A.A., Chapman, D.A., Killian, G.J. (1989) An improved assay for phospholipase A2 activity in sperm. *J. Andrology* 10:47

Wyrick, S.D., Smith, F.T., Grippo, A.A. (1986) Synthesis of agents affecting astrocytic chloride influx. *Proc. of the Meeting in Miniature, ACS Research Triangle Section*

Chapman, D.E., Roberts, G.B., Grippo, A.A., Hall, I.H., Chaney, S.G., Chang, J., Reynolds, D.J., Holbrook, D.J. (1986) Acute toxicity of helenalin in BDF1 mice. *The Toxicologist.* 5:299

Grippo, A.A., Wyrick, S.D., Shrewsbury, R.P., Chaney, S.G., Holbrook, D.J., Lee, K.H., Hall, I.H. (1985) The disposition of [3H]-11,13-dihydrohelenalin, a derivative of the sesquiterpene lactone helenalin. *The Pharmacologist.* 27:109

Grippo, A.A., Williams, W., Lee, K.H., Chaney, S., Holbrook, D., Hall, I.H. (1985) Antineoplastic activity of the natural product helenalin. *Proc. of the International Res. Congress on Natural Products*

Grippo, A.A., Hall, I.H., Holbrook, D.J., Chaney, S.D. (1984) The role of cellular levels of reduced glutathione on the efficacy of an antitumor sesquiterpene lactone. *Proc. of the ACS Southeastern Regional Meeting*

Grippo, A.A., Hall, I.H., Lee, K.H., Holbrook, D.J. (1983) The toxicology and mechanism of helenalin, an antitumor sesquiterpene lactone. *Proc. of the ACS Southeastern Regional Meeting*

Dyer, J.R., King, D.R., Auriemma, A.M. (1979) Studies of the reaction between carbon disulfide and sodium hydroxide. *Proc. of the ACS Northeastern Regional Meeting*

## **Reviews**

Grippo, A. (2012). *Biochemistry text review*. Jacksonville, FL: John Wiley & Sons.

Grippo, A. (2013) *Human Anatomy & Physiology text review*. McGraw-Hill Company

## **Institutional Committees**

### **University**

Honors Council (University) Fall 1999 - Summer 2013

College Preprofessional Committee (University) Fall 2007 - Summer 2013



College Assessment Committee (University) Fall 2011 -  
Summer 2013

### **Other Institutional Service**

(Committee Chair) Assessment Committee (University) Fall 2011 -  
Fall 2012

(Committee Chair) Cell/Molecular Physiologist Search Committee  
(University) Fall 2009 - Spring 2010

(Committee Member) IACUC (University) Fall 2009 - Summer 2012

(Attendee, Meeting) GK12 Advisory Committee (University) Fall 2009

(Attendee, Meeting) Harp Field Station Inaugural (University)  
Fall 2009

(Faculty Advisor) Women in Science (University) Fall 2009

(Special Institutional Assignment) ABI Outreach Search Committee  
(University) Fall 2008

(Faculty Advisor) Women in Science (University) Fall 2008 -  
Summer 2012

(Committee Chair) Environmental Sciences Program Committee  
(University) Fall 2008 - Fall 2009

(Committee Member) Chancellor's Task Force on Teaching/Research  
Balance (University) Spring 2008 - Summer 2008

(Committee Member) Dean of College of Science & Math Search  
Committee (University) Spring 2008 - Spring 2009

(Committee Chair) Advising Award (University) Spring 2008

(Committee Member) ABI Space Committee (University) Fall 2007 -  
Fall 2010

(Committee Member) Cell Biologist Search Committee (University)  
Fall 2007 - Spring 2008

(Committee Member) Organic Chemist Search Committee (University)  
Fall 2006 - Spring 2007

(Committee Member) MBS Program Committee (University) Fall 2006  
- Fall 2010

(Committee Chair) IACUC (University) Fall 2006 - Fall 2009

(Committee Member) Biology Scholarship Committee (University)  
Fall 2006 - Summer 2012

(Committee Chair) Curriculum Committee (University) Fall 2006 -  
Summer 2012

(Faculty Advisor) CSM Honors Advisor (University) Fall 2006 -  
Summer 2012

### **Professional Service**

Reviewer, Journal Article, American Journal of Health Systems  
Pharmacy Summer 2012 - Fall 2007

Reviewer, Journal Article, American Journal of Health Systems  
Pharmacy Summer 2012 - Spring 2007

Reviewer, Grant Proposal, South African Medical Research Council  
Summer 2012 - Fall 2007

Reviewer, Journal Article, American Journal of Health Systems  
Pharmacy Summer 2011

Other, ASU Science Seminar Series Fall 2008  
Reviewer, Journal Article, Journal of Integrative Biosciences Fall 2008  
Reviewer, Journal Article, Ann. Pharmacother. Fall 2008  
Other, Environmental Sciences Graduate Program Fall 2008 -  
Fall 2009  
Session Chair, Society for Environmental Studies Summer 2008  
Reviewer, Journal Article, J Pharmacy Pharmacology Spring 2008  
Reviewer, Grant Proposal, University of Missouri Research Board  
Spring 2008  
Officer, President/Elect/Past, Phi Kappa Phi Fall 2007 - Fall 2011

## Honors and Awards

You Made a Difference Award Nominee, ASU Advising Center 2012  
Highly recommended professor of a general education course, ASU  
Assessment Office 2011  
You Made a Difference Award Nominee, ASU Advising Center 2009  
Nominated for Literature Award in Pharmacy Practice Research,  
American Society of Health-System Pharmacists Foundation 2007

## Teaching

### Fall 2006 Courses:

CHEM 4243 001 - Biochemistry  
CHEM 4243 002 - Biochemistry  
CHEM 427V 006 - RESEARCH IN CHEMISTRY  
CHEM 427V 007 - RESEARCH IN CHEMISTRY  
CHEM 427V 008 - RESEARCH IN CHEMISTRY  
CHEM 5243 1 - BIOCHEMISTRY  
ESCI 713V 10 - IND RSRCH HPLC ANALY OF FLUIDS  
ESCI 713V 11 - IND RSRCH PHYSIO EFFECTS ON BP  
ESCI 713V 12 - IND RSRCH PHYSIO EFCTS BLOOD P

### Spring 2007 Courses:

BIOL 1001 020 - Biological Science Laboratory  
BIOL 3311 1 - GENETICS LAB  
BIOL 3311 2 - GENETICS LAB  
BIOL 4343 1 - PHARMACOLOGY  
BIOL 5343 1 - PHARMACOLOGY  
CHEM 427V 006 - RESEARCH IN CHEMISTRY  
CHEM 4343 001 - Pharmacology  
CHEM 5343 1 - PHARMACOLOGY  
ESCI 713V 28 - IND RSRCH PHYSIO EFFECTS BLOOD  
ESCI 713V 29 - IND RSRCH ARTERIAL RESPONSE  
ESCI 713V 30 - IND RSRCH COMPLETE HPLC ANALYS

MBS 711V 1 - SEMINAR IN MBS  
ZOO 3161 3 - HUMAN STRUCT AND FUNCT II LAB

**Summer 2007 Courses:**

CHEM 427V 002 - RESEARCH IN CHEMISTRY  
CHEM 427V 2 - RESEARCH IN CHEMISTRY

**Fall 2007 Courses:**

BIOL 439V 12 - SPPR ESTROGEN DEPLETION RATS  
BIOL 439V 13 - SPPR BRAIN PHYTOESTROGENS  
BIOL 439V 14 - SPPR RAT CARDIOVASCULAR STUD  
CHEM 4243 001 - Biochemistry  
CHEM 427V 013 - RESEARCH IN CHEMISTRY  
CHEM 427V 014 - RESEARCH IN CHEMISTRY  
CHEM 5243 1 - BIOCHEMISTRY  
ESCI 889V 8 - DISSERTATION  
ESCI 889V 9 - DISSERTATION  
MBS 711V 1 - SEMINAR IN MBS  
ZOO 2001 4 - HUMAN ANATOMY PHYSIO LAB I  
ZOO 2001 5 - HUMAN ANATOMY PHYSIO LAB I  
ZOO 2001 6 - HUMAN ANATOMY PHYSIO LAB I

**Spring 2008 Courses:**

BIOL 4343 1 - PHARMACOLOGY  
BIOL 5343 1 - PHARMACOLOGY  
CHEM 4343 001 - Pharmacology  
ESCI 889V 17 - DISSERTATION  
ESCI 889V 18 - DISSERTATION  
MBS 7111 1 - SEMINAR IN MBS  
ZOO 4223 1 - HUMAN ENDOCRINOLOGY

**Fall 2008 Courses:**

BIO 2013 002 - Biology of the Cell  
BIO 2203 003 - Human Anatomy and Physiology I  
BIOL 1001 020 - Biological Science Laboratory  
ESCI 713V 22 - IND RSRCH PROTEIN BIOANALYSIS  
MBS 7111 1 - SEMINAR IN MBS

**Spring 2009 Courses:**

BIO 2221 005 - Human Anatomy and Physiology II Laboratory

BIO 403V 004 - SPEC PROBLEMS  
BIO 4133 001 - Cell Biology  
BIO 4133 002 - Cell Biology  
BIO 4143 001 - Pharmacology  
BIO 5133 1 - CELL BIOLOGY  
BIO 5143 1 - PHARMACOLOGY  
BIO 680V 10 - IND ST ESTROGEN DEPLET IN RATS  
CHEM 4343 001 - Pharmacology  
CHEM 5343 1 - PHARMACOLOGY  
ESCI 713V 1 - IND RES PROTEIN BIOANAL PT II  
ESCI 713V 11 - IND RES 2DPAGE LA ICP MS METH  
ESCI 713V 12 - IND RES LA ICP MS OF PADDLEFIS  
ESCI 713V 13 - IND RES WATERSHED GIS MODELING  
ESCI 713V 14 - IND RES SURF WATER HYDROCHEMIS  
ESCI 713V 20 - IND RES TYRONZA RIVER TECH A  
ESCI 713V 21 - IND RES TYRONZA RIV TECH B  
ESCI 713V 22 - IND RES TYRONZA RIVER TECH C  
ESCI 713V 24 - IND RES GROUNDWATER HYDROCHEM  
ESCI 713V 27 - INDEPENDENT RESEARCH  
ESCI 889V 1 - DISSERTATION  
MBS 7111 1 - SEMINAR IN MBS

**Fall 2009 Courses:**

BIO 2011 001 - Biology of the Cell Laboratory  
BIO 2011 002 - Biology of the Cell Laboratory  
BIO 2011 003 - Biology of the Cell Laboratory  
BIO 2011 004 - Biology of the Cell Laboratory  
BIO 2011 005 - Biology of the Cell Laboratory  
BIO 2013 001 - Biology of the Cell  
BIO 403V 009 - SPEC PROBLEMS  
BIO 504V 1 - SP TOP CELL BIOLOGY UPDATE  
MBS 7111 1 - SEMINAR IN MBS

**Spring 2010 Courses:**

BIO 2011 001 - Biology of the Cell Laboratory  
BIO 2011 002 - Biology of the Cell Laboratory  
BIO 2011 003 - Biology of the Cell Laboratory  
BIO 403V 007 - SPEC PROBLEMS  
BIO 404V 002 - SPEC TOPICS  
BIO 4131 001 - Cell Biology Lab T  
BIO 4133 001 - Cell Biology  
BIO 4143 001 - Pharmacology  
BIO 4143 002 - Pharmacology  
BIO 504V 1 - SP TOP INQUIRY BASED EXPERIMEN

BIO 5131 1 - CELL BIOLOGY LABORATORY  
BIO 5133 1 - CELL BIOLOGY  
BIO 5143 1 - PHARMACOLOGY  
BIO 680V 14 - INDEPENDENT STUDY  
BIO 680V 15 - INDEPENDENT STUDY  
BIO 680V 16 - IND ST BIOLOGY CELL LAB MANUAL  
CHEM 4343 001 - Pharmacology  
CHEM 5343 1 - PHARMACOLOGY  
MBS 7111 1 - SEMINAR IN MBS

**Fall 2010 Courses:**

BIO 2011 001 - Biology of the Cell Laboratory  
BIO 2011 002 - Biology of the Cell Laboratory  
BIO 2011 005 - Biology of the Cell Laboratory  
BIO 2013 001 - Biology of the Cell  
BIO 2201 014 - Human Anatomy and Physiology I Laboratory  
BIO 2203 002 - Human Anatomy and Physiology I  
BIO 403V 006 - SPEC PROBLEMS  
BIO 504V 1 - SP TOP INQUIRY BASED EXPERIMEN  
BIO 504V 2 - SP TOP BEAN BEETLES AND NEEM  
BIO 638V 8 - TH BLBERRY ANTIO IN OVX RATS  
BIO 680V 8 - INDEPENDENT STUDY

**Spring 2011 Courses:**

BIO 2201 002 - Human Anatomy and Physiology I Laboratory  
BIO 2221 001 - Human Anatomy and Physiology II Laboratory  
BIO 2221 002 - Human Anatomy and Physiology II Laboratory  
BIO 403V 008 - SPEC PROBLEMS  
BIO 4131 001 - Cell Biology Lab T  
BIO 4133 001 - Cell Biology  
BIO 504V 2 - SP TOP INQUIRY BASED EXPERIMEN  
BIO 504V 3 - SP TOP COMPARING LAB APPROACH  
BIO 5131 1 - CELL BIOLOGY LABORATORY  
BIO 5133 1 - CELL BIOLOGY  
BIO 638V 5 - THESIS BLUEBERRY ANTIOXIDANTS  
BIO 680V 10 - INDST CARDIO CHANGES OVX RATS  
BIO 680V 2 - IND STU UPDAT BIO OF CELL LABS  
BIOL 1001 028 - Biological Science Laboratory

**Fall 2011 Courses:**

BIO 2011 003 - Biology of the Cell Laboratory  
BIO 2011 004 - Biology of the Cell Laboratory

BIO 2201 003 - Human Anatomy and Physiology I Laboratory  
BIO 2201 014 - Human Anatomy and Physiology I Laboratory  
BIO 2203 002 - Human Anatomy and Physiology I  
BIO 2203 003 - Human Anatomy and Physiology I  
BIO 403V 003 - SPEC PROBLEMS  
BIO 504V 1 - SP TOP TRY OUT THE CLASSROOM  
BIO 680V 11 - IND ST SCI SYMPOSIUM PRODUCTS

**Spring 2012 Courses:**

BIO 2201 007 - Human Anatomy and Physiology I Laboratory  
BIO 2223 001 - Human Anatomy and Physiology II  
BIO 2223 H01 - HNRS HUMAN ANATMY PHYSIOLOGY II  
BIO 4131 001 - Cell Biology Lab T  
BIO 4133 001 - Cell Biology  
BIO 4133 H01 - HNRS CELL BIOLOGY  
BIO 4143 001 - Pharmacology  
BIO 5131 1 - CELL BIOLOGY LABORATORY  
BIO 5133 1 - CELL BIOLOGY  
BIO 5143 1 - PHARMACOLOGY  
BIO 638V 3 - MINORITY FIRST LADIES OF SCI  
CHEM 4343 001 - Pharmacology

**Fall 2012 Courses:**

BIO 2011 003 - BIOLOGY OF THE CELL LAB  
BIO 2011 004 - BIOLOGY OF THE CELL LAB  
BIO 2011 005 - BIOLOGY OF THE CELL LAB  
BIO 2013 H02 - HNRS BIOLOGY OF THE CELL  
BIO 2201 003 - HUMAN ANAT AND PHYSIO LAB I  
BIO 2201 007 - HUMAN ANAT AND PHYSIO LAB I  
BIO 2201 014 - HUMAN ANAT AND PHYSIO LAB I  
BIO 3223 001 - HUMAN STRUCTURE AND FUNCTION I  
BIO 3223 H02 - HNRS HUMAN STRUCT FUNCTION I  
BIO 638V 010 - THESIS CLIN SCEN IN MICRO LAB