PAMELA K. HANSON

Associate Professor of Biology
Birmingham-Southern College
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Education:

Ph.D., Biochemistry, Cell and Developmental Biology Program, Spring 2001
Graduate Division of Biological and Biomedical Sciences, Emory University, Atlanta, GA

B.S., Biochemistry, *cum laude*, May 1996
Rhodes College, Memphis, TN

Professional Experience:

Birmingham-Southern College
Birmingham, AL. Associate Professor (2007-present). Assistant Professor (2001-2007)

University of Iowa
Iowa City, IA. Visiting Associate Professor (Spring 2008; Summer 2009). Laboratory of Dr. W. Scott Moye-Rowley, Department of Molecular Physiology and Biophysics

Research Interests:

My research focuses on using the budding yeast *Saccharomyces cerevisiae* as a model system to better understand mechanisms of resistance to alkylphospholipid analogues and anti-cancer ruthenium complexes.

Grants:

Associated Colleges of the South Faculty Renewal Program (Feb 2009-May 2010)
Leadership Development Grant (Leadership Team Member)
- Assisted in proposal writing process
- Collaborated with other leadership team members in selecting seminar and workshop topics
- ACS Faculty Program is funded by the Andrew W. Mellon Foundation

National Science Foundation (May 2006-May 2010)
Course, Curriculum, and Laboratory Improvement Phase I Grant (Principal Investigator)
- "Enhancing Multidisciplinarity through Molecular Modeling"
- Collaborate with biology and chemistry faculty to develop new lab modules
- Design and implement appropriate assessment of molecular modeling modules

Center for Educational Technology (January 2006-May 2007)
Learning Objects in Support of an Interdisciplinary Approach to the Teaching of Cancer Biology to Non-science Majors (Co-Principal Investigator)
- Collaborated with faculty from other institutions on design of learning objects
- Contributed to construction, assessment, and revision of learning objects

Associated Colleges of the South Science Reform Program (May 2005-May 2007)
Review, Redesign, and Reimplementation Mini-Grant (Principal Investigator)
- A Textbook Prototype for Non-Science Majors Cancer Biology Courses
- Developed course materials and lab exercises for teaching cancer biology to non-science majors
- ACS Science Reform Program was funded by W.M. Keck Foundation of Los Angeles

Merck – American Association for the Advancement of Science (2003-2005)
Undergraduate Science Research Program 2003-2005 (Co-Investigator)
- Worked with chemistry faculty to develop research projects
- Supervised students studying toxicity of ruthenium complexes in yeast

Associated Colleges of the South Technology Center (Fall 2005)
Project Development Grant (Principal Investigator)
- Purchased Macromedia Flash MX Professional 2005
- Continued development of interactive learning modules related to cancer biology

Hewlett Packard (2004-2005)
Applied Mobile Technology Solutions in Learning Environments Grant (Co-Investigator)
- Proposed and implemented teaching modules that take advantage of HP tablet laptop mobility

LI-COR Biosciences (Fall 2004)
Genomics Education Matching Funds Grant (Principal Investigator)
- Worked with biology faculty to develop projects for grant
- Implemented teaching modules that employ DNA sequencing

National Computational Science Institute (Fall 2003)
Computational Chemistry for Chemistry Educators Software Mini-grant (Principal Investigator)
- Purchased a copy of Stark Design Atomic Microscope for use in General Chemistry
- Purchased one copy of Spartan '04 for use in molecular modeling modules

NIH training grant GM08367
Emory University, August 1997-August 1999

Selected Professional Responsibilities, Honors, Organizations:

Education Workshop Organizer
Yeast Genetics and Molecular Biology Meeting; University of Toronto; Summer 2008

Who's Who Among America's Teachers
8th Edition, 2004; 9th Edition, 2005; 11th Edition, 2007

Council on Undergraduate Research
Councilor, Biology Division, 2009-2012
Member, 2004-present

Genetics Society of America
Member, 1998-present

AAAS Mass Media Science and Engineering Fellowship
Chicago Tribune; Summer 2000

Selected Campus Honors and Responsibilities:

Promotion and Tenure Committee
Elected member (2008-present)
- Review applications for promotion and tenure
- Interview applicants for tenure-track positions

Honor Council
Faculty Adviser (2008-present)
- Work with Honor Council members on training and outreach
- Monitor Honor Council trials

BSC Institutional Review Board
Member (2005-2007)
- Reviewed proposals for research involving human subjects

Health Professions Advisory Committee
Member (2003-2007)
- Reviewed student applications to the committee
- Assisted in writing letters of recommendation to professional schools

Freshman Orientation Pilot Study
Pilot Study Coordinator (summer 2007)
- Worked with Residence Life and Student Affairs to organize an extended orientation
- Taught interdisciplinary course: Ecological Disasters and Human Health
- Assessed student response and disseminated results to faculty at large

Beta Beta Beta, Biology Honor Society
Faculty Adviser (2002-2007)
- Worked with student officers to organize membership drives, initiation, and service activities

Biology Discipline Coordinator
Discipline Coordinator (2005-2006)
- Led weekly meetings to discuss departmental issues including curriculum, schedule, and budget
- Worked with Division Chair to establish schedule and annual budget request
- Coordinated search for new biology faculty member

Summer Research Seminar Series
Faculty sponsor and coordinator (2002, 2006)
- Organized weekly research presentations by students and faculty
- Coordinated and hosted picnic for seminar participants

Division of Math and Science Senior Conference Committee
Co-chair and founding member (2004-2005)
- Organized a week of senior research presentations and associated banquet

Mellon Foundation Grant: Beyond the Boundaries to Acculturation and Renewal
Supervisory Team Member (2004-2005)
- Assembled and supervised faculty teams working on projects related to Advising, Latin American Studies, and Interdisciplinarity
- Explored models of faculty development and wrote progress reports

Inauguration Week Task Force
Member (Fall 2004)
- Developed theme for the new College president's inauguration
- Organized an event exploring connections between the natural sciences and the performing arts

Intellectual Property Rights Policy Task Force
Member (2003-2004)
- Wrote initial draft of College policy regarding intellectual property rights

Admissions Committee
Member (2002-2003)
- Reviewed applications of prospective students

Bob Whetstone Faculty Development Award (outstanding teaching by non-tenured faculty member)
Birmingham-Southern College, 2002-2003 academic year

Publications:

Berger, A.C., Hanson, P.K., Nichols, W.N. and A.H. Corbett. (2005) A yeast model system for functional analysis of the niemann-pick type C protein 1 homolog, Ncr1p. *Traffic.* **6**: 907-17.

Hanson, P.K., Malone, L., Birchmore, J.L. and J.W. Nichols. (2003) Lem3p is essential for the uptake and potency of alkylphosphocholine drugs, edelfosine and miltefosine. *J. Biol. Chem.* **278**: 36041-50.

Hanson, P.K., Grant, A.M. and J.W. Nichols. (2002) NBD-labeled phosphatidylcholine enters the yeast vacuole via the pre-vacuolar compartment. *J. Cell Sci.* **115**: 2725-33.

Hanson, P.K. and J. W. Nichols. (2001) Energy-dependent flip of fluorescence-labeled phospholipids is regulated by nutrient starvation and transcription factors, *PDR1* and *PDR3*. *J. Biol. Chem.* **276**: 9861-7.

Grant, A.M., Hanson, P.K., Malone, L.M. and J. W. Nichols. (2001) NBD-labeled phosphatidylcholine and phosphatidylethanolamine are internalized by transbilayer transport across the yeast plasma membrane. *Traffic* **2**: 37-50.

Abstracts: (Undergraduates are underlined)

Oral Presentations

Stevens, S., McCarty, J., and P.K. Hanson (2008) Multiple pathways process DNA damage induced by the anti-cancer ruthenium complex KP1019. *UAB Genomics Seminar Series*; Birmingham, AL.

Hanson, P.K. (2008) Linking biology and chemistry courses through molecular modeling. *Interdisciplinarity in Science and Mathematics Conference*; San Antonio, TX.

Hanson, P.K. (2006) Enhancing multidisciplinarity through molecular modeling. *Interdisciplinarity in Science and Mathematics Conference*; San Antonio, TX.

Preston, T. C. and P.K. Hanson (2006) ABC transporters contribute to miltefosine resistance in *PDR* strains. *Yeast Genetics and Molecular Biology Meeting*; Princeton, NJ.

Hanson, P.K. (2005) Cancer biology textbook for non-science majors. *Associated Colleges of the South Science Reform Workshop*; Greenville, SC.

Hanson, P.K., Malone, L.M., Birchmore, J.L., and J.W. Nichols. (2002) Identification of a novel regulator of NBD-phosphatidylcholine flip and anti-tumor, ether phospholipid toxicity in yeast. *Yeast Genetics and Molecular Biology Meeting*; Madison, WI.

Hanson, P.K., Malone, L.M., and J.W. Nichols. (2001) Identification of a novel regulator of NBD-phosphatidylcholine flip. *Southeastern Regional Yeast Meeting*; Hattiesburg, MS.

Hanson, P.K., Grant, A.M., and J.W. Nichols. (2000) NBD-phosphatidylcholine enters the yeast vacuole via the pre-vacuolar compartment. *Southeastern Regional Lipid Conference*; Cashiers, NC.

Hanson, P.K., DeRisi, J.L., Malone, L.M., Brown, P.O., and J.W. Nichols. (1999) Pdr5p and Yor1p are fluorescent-phosphatidylethanolamine floppases in yeast. *Georgia Alabama Tennessee Conference*, Atlanta, GA, and *Southeastern Regional Lipid Conference*, Cashiers, NC.

Hanson, P.K., DeRisi, J.L., Malone, L.M., Brown, P.O., and J.W. Nichols. (1999) Identification of regulators of phospholipid flip and flop. *FEBS Advanced Yeast Lipid Course*, Utrecht, The Netherlands.

Hanson, P.K., Grant, A.M., and J.W. Nichols. (1998) *PDR1* and *PDR3* regulate flip and flop at the yeast plasma membrane. *Southeastern Regional Lipid Conference*, Cashiers, NC.

Representative Posters

Gammons, S., Stevens, and P.K. Hanson. (2009) The anti-cancer ruthenium complex KP1019 induces Rad52-GFP focus formation. *Southeastern Regional Yeast Meeting*, Nashville, TN

Hussey-Tomich, K., and P.K. Hanson. (2009) Analysis of the Importance of *ELM1* in Activation of the Pdr Network by Hexadecylphosphocholine. *Southeastern Regional Yeast Meeting*, Nashville, TN

Speake, L., Moye-Rowley, W.S., and P.K. Hanson. (2009) Deletion of the Inositol Phosphotransferase Gene *IPT1* Increases Expression of the Multidrug Transporter Pdr5p. *Southeastern Regional Yeast Meeting*, Nashville, TN

Banks, E.A., Dahlene, K.E., Reddy, A., Stultz, L.K., and P.K. Hanson. (2007) Disruption of recombination repair confers sensitivity to the anti-cancer ruthenium complex, *mer*-[Cl_3(terpy)Ru^{II}I]. *Southeastern Regional Yeast Meeting*, Birmingham, AL

Preston, T.C., Mincher, A.W., Stultz, L.K., and P.K. Hanson. (2005) Sensitivity of *PDR* mutants to metal-based chemotherapeutics. *Southeastern Regional Yeast Meeting*, Atlanta, GA

Mincher, A.W., Preston, T.C., Stultz, L.K., and P.K. Hanson. (2005) Synthesis and characterization of NAMI-A, a chemotherapeutic ruthenium complex. *Southeastern Regional Yeast Meeting*, Atlanta, GA

Crump, J.E. and P.K. Hanson. (2005) Identification and characterization of mutations that suppress the miltefosine-resistant phenotype of *Δlem3* strains of *Saccharomyces cerevisiae*. *Southeastern Regional Yeast Meeting*, Atlanta, GA

Hanson, P.K. (2004) Cancer—Biology and Beyond: A thematic course for non-science majors. *Associated Colleges of the South Science Literacy, Course Design, and Course Assessment Workshop*, Jackson, MS

Russell, C.H., Dranka, B.P., Hughes, S.K., Preston, T.C., Mincher, A.W., Stultz, L.K., and P.K. Hanson. (2004) Identification of genes that regulate resistance to chemotherapeutic ruthenium complexes. *Yeast Genetics and Molecular Biology Meeting*, Seattle, WA.

Crump, J.E., and P.K. Hanson. (2004) Identification and Characterization of mutations that suppress the miltefosine-resistant phenotype of *Δlem3* strains of *Saccharomyces cerevisiae*. *Southeastern Regional Yeast Meeting*, Memphis, TN.

Gandy, J.C. and P.K. Hanson. (2004) Pdr1p regulates *LEM3* expression in *Saccharomyces cerevisiae*. *Southeastern Regional Yeast Meeting*, Memphis, TN.

Noureddini, W.C., Schedler, D.J.A., and P.K. Hanson. (2003) Molecular Modeling Study of the Interactions Between Phosphatidylinositol-specific Phospholipase C and the Alkylphosphocholine Drug ET-18-O-CH_3. *Gordon Conference on Lipid Metabolism*, Meriden, NH.

Dranka, B.P., Hughes, S.K., Stultz, L.K. and P.K. Hanson. (2003) Ruthenium Complexes as Anti-cancer Drugs: Using *Saccharomyces cerevisiae* to Study Hypoxic Selectivity and Cellular Resistance. *Southeastern Regional Yeast Meeting*, Birmingham, AL.

Deason, K.L. and P.K. Hanson. (2002) Analysis of the Effects of CTP: Phosphocholine Cytidylyltransferase Overexpression in *Saccharomyces cerevisiae*. *Southeastern Regional Lipid Conference*, Cashiers, NC.

Hanson, P.K., Malone, L., Birchmore, J.L. and J.W. Nichols. (2002) Lem3p is essential for the uptake and potency of alkylphosphocholine drugs, edelfosine and miltefosine. *Southeastern Regional Lipid Conference*, Cashiers, NC.

Hanson, P.K., Grant, A.M., and J.W. Nichols. (2000) Intracellular trafficking of NBD-phospholipids. *Yeast Genetics and Molecular Biology Meeting*, Seattle, WA.

Hanson, P.K., DeRisi, J.L., Malone, L.M., Brown, P.O., and J.W. Nichols. (1999) Identification of regulators of phospholipid flip and flop. *Yeast Cell Biology Meeting*, Cold Spring Harbor, NY.

Hanson, P.K., Grant, A.M., and J.W. Nichols. (1998) *PDR1* and *PDR3* regulate flip and flop in *S. cerevisiae*. *American Society for Cell Biology Meeting*, San Francisco, CA.

Hanson, P.K., Grant, A.M., and J.W. Nichols. (1998) Upregulated efflux of fluorescent-labeled phosphatidylethanolamine is specific for mutant alleles of *PDR1* and *PDR3* that are accumulation defective. *Yeast Genetics and Molecular Biology Meeting*, College Park, MD.

Intramural Grants and Funding:

Summer 2009 Research Stipend ($3000)

- Studied genetic interactions between sphingolipid metabolism and drug resistance

Summer 2003 Course Development Stipend ($2750)

- Developed non-majors course "Understanding the Human Genome Project"

Summer 2003 Course Development Stipend ($2000 – split with chemistry professor)

- Development of interdisciplinary lab module "Plasticizers in Vegetable Oil"

Summer 2002 Course Development Stipend ($2750)

- Developed non-majors course "Cancer—Biology and Beyond"