

## **MELISSA D. KELLEY**

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### **EDUCATION**

Ph.D. Biochemistry and Molecular Biology, Department of Biochemistry and Molecular Biology, Oklahoma State University, May 2000

Dissertation Title: Growth Promoting Activity and Metabolism of Select Heteroarotinoids in Vitamin A-Deficient Rats.  
Advisor: Dr. E.C. Nelson

B.S. Biochemistry, Department of Biochemistry, Kansas State University, May 1994

### **TEACHING EXPERIENCE**

#### **ASSISTANT PROFESSOR**

Dept. of Chemistry, UCA (August 2003-Present)

**Chemistry 1402: Physiological Chemistry I**  
**Chemistry 2450: Physiological Chemistry II**  
**Chemistry 3300: Principles of Biochemistry**  
**Chemistry 3350: Metabolic Biochemistry**  
**Chemistry 4321: Biochemistry Laboratory**  
**Chemistry 4350: Biochemistry I**

#### **VISITING INSTRUCTOR**

Dept. of Biochemistry and Molecular Biology, OSU (July 2001-June 2003)

**Biochemistry 2344: Introduction to Organic and Biochemistry**

Responsibilities:

- Lecture
- Wrote and prepared course quizzes and exams
- Prepared course syllabi
- Maintained course, grades, attendance, and web site
- Conducted exam reviews

Average class size: 60-70 students

### **Collaborating with Instructor of Record in Biochemistry 3653: Survey of Biochemistry**

Responsibilities:

- Development of an interactive website for biochemistry students
- Introduction of problem-based learning
- Lecturing and class maintenance

Average class size: 100-160 students and 20 graduate students

### **Freshmen Research Scholars Program:**

Responsibilities instructing students in:

- Experimental planning,
- Developing and testing a hypothesis
- Basic laboratory techniques
- Analyzing data
- Poster presentation of results

Program consists of 80 freshmen majoring in biochemistry

### **Biochemistry 4990: Special Problems**

Responsibilities:

- Worked with approximately 35 freshmen, 10 juniors, and 10 seniors in a research laboratory.
- Freshmen students were taught basic HPLC theory and application.
- Supervised upperclassman on various laboratory projects.

### **Undergraduate Student Advising:**

Responsibilities:

- Aided in co-advisement of approximately 160 departmental undergraduates

### **Graduate Student Recruiting:**

Responsibilities:

- Implement the use of new graduate student recruiting materials
- Recruit quality graduate students into the OSU Biochemistry program

### **POST-DOCTORAL RESEARCH ASSOCIATE**

Dept. of Biochemistry and Molecular Biology, OSU (Sept 2000-June 2001)

Team-taught Biochemistry 2344: Introduction to Organic and Biochemistry, OSU.

Experience teaching numerous undergraduates on laboratory safety and techniques in a one-on-one or small group setting in a research laboratory. Laboratory techniques included pipetting, solution preparation, reverse-phase HPLC, solid and liquid phase extractions methods.

## **GRADUATE TEACHING ASSISTANT**

Dept. Biochemistry and Molecular Biology, OSU (Sept 1994-May 2000)

### **Biochemistry 3653 Survey of Biochemistry**

Responsibilities:

Course grading

Attendance

Review sessions

Average class size: 100-120 students

### **Biochemistry 3824: Introduction to Biochemistry Laboratory**

Responsibilities:

Laboratory preparation

Assisting students on different laboratory techniques and experiments

Grading laboratory reports

Average class size: 20-25 students

### **Biochemistry 5824: Introduction to Graduate Biochemistry Laboratory**

Responsibilities:

Laboratory preparation

Assisting students on different laboratory techniques and experiments

Grading laboratory reports

Average class size: 20-25 students

Instructed undergraduate students individually in the research laboratory on advanced laboratory techniques and data analysis. Students varied from freshmen to seniors.

Approximately 10-15 students per year.

Advised senior students on laboratory techniques and data collection for the Lou Wentz Research Scholars Program.

## **RESEARCH EXPERIENCE**

### **ASSISTANT PROFESSOR**

Dept. Chemistry, UCA (Aug 2003-present)

### **POST-DOCTORATE RESEARCH ASSOCIATE**

Dept. Biochemistry and Molecular Biology, OSU (Sept 2000-June 2001)

Wrote research articles for publication, and progress reports and research plans for National Institute of Health grant application.

Coordinated and managed activities of both graduate and undergraduate students and technical staff in the laboratory on metabolite studies and data analysis.

Isolated, purified, and identified anticancer drug metabolites in vivo or a radiolabelled compound using solid phase extraction techniques coupled with reverse-phase HPLC.

### **GRADUATE RESEARCH ASSISTANT**

Dept. Biochemistry and Molecular Biology, OSU (Sept 1994-May 2000)

Isolated, purified, and identified anticancer drug metabolites in *in vitro* and *in vivo* biological media using liquid-liquid and solid phase extraction techniques coupled with reverse-phase HPLC.

Developed and implemented analytical methods for isolating and identifying metabolites from complex biological matrices, including liver, kidneys, testes, and serum.

Skilled in cell culture, laboratory animal care, drug administration, radiotracer methodologies, animal necropsy and tissue collection for metabolite isolation and histopathological techniques.

### **UNDERGRADUATE RESEARCH ASSISTANT**

Dept. Biochemistry, Kansas State University (Aug 1993-May 1994)

Experience with circular dichroism, spectrophotometers, and protein quantitation.

## **FUNDING**

Metabolism of the Anti-Cancer Drug 4-HPR (\$1000). UCA Faculty Enhancement Award. Oct. 2004.

Vitamin A Metabolism in Type 2 Diabetes (\$8430). University Research Council. Nov. 2004.

Type 2 Diabetes and Vitamin A Metabolism (\$2500). University Research Council Summer Stipend. Jan. 2005.

Enhancing Biochemistry Education by Attending the Education in the Biomolecular Sciences at the American Society for Biochemistry and Molecular Biology Meetings 2005 (\$1091). University Faculty Development Grant. Jan. 2005.

RUI: Chemical stimulants of vein cutting and trenching behaviors in insect herbivores (\$299,531). National Science Foundation. Jan. 2005. Co-PI with David Dussourd. Funding was denied.

RUI: Trenching and girdling by noctuid and notodontid caterpillars: Using pest behavior to elucidate crop defenses (\$379,012). National Science Foundation. Jan. 2006 Co-PI with David Dussourd. Funding was denied.

Enhancing the Chemistry Curriculum by Attending the National Conference on Undergraduate Research (\$1824). University Faculty Development Grant. Feb 2006.

Trenching and girdling by noctuid and notodontid caterpillars: Using pest behavior to elucidate crop defenses (\$379,012). U.S. Dept. of Agriculture. Jan 2007. Funding was denied.

Effect of Retinoids on Lymphocyte Metalloprotease Mediated Shedding (Co-PI with L. Bridges) (\$6,500). University Research Council. Nov. 2007.

Effect of Retinoids on Lymphocyte Metalloprotease Mediated Shedding (Co-PI with L. Bridges) Research Corporation (\$56,650). Nov. 2007.

Merck/AAAS Undergraduate Science Research Program (\$20,000/ year for three years). Nov. 2007. Funding was denied.

Expansion of Commonly Used Incubation and Freezer Equipment in the College of Natural Sciences and Mathematics at the University of Central Arkansas (Co-PI with J.D. Swanson, K. Naylor, L. Bridges, and B. Hill INBRE (\$24,890). Jan 2008.

### **PRESENTATIONS**

Chang, A. and **Kelley, M.D.** "Isolation and Characterization of All-*trans*-retinoic acid isomers produced by ultraviolet light exposure." National Conference of Undergraduate Research (NCUR), Asheville, NC April 2006.

**Kelley, M.D.** "Making the chemistry connection. Integrating mini-reviews and case studies to teach biochemistry to senior level biology students." 233rd American Chemical Society National Meeting, Chicago, IL April 2007.

Malcolm, E. and **Kelley, M.D.** "Separation and Isolation of Metabolites of *N*-(4-hydroxyphenyl) retinamide (4-HPR) after Incubation with Sprague-Dawley Rat Liver Microsomes" 233rd American Chemical Society National Meeting, Chicago, IL April 2007.

Grandon, R., Bridges, L.C., and **Kelley, M.D.** "Retinoid Metabolism in Human B Lymphocyte (RPMI 8866) Cell Line" 235th American Chemical Society National Meeting, New Orleans, LA April 2008.

Brazeal, J. and **Kelley, M.D.** "The Influence of Type-II Diabetic Drugs on Retinoid Metabolism" 235th American Chemical Society National Meeting, New Orleans, LA April 2008.

Lingo, J.D., **Kelley, M.D.** and Bridges, L.C. "Human ADAM7 mRNA is Expressed in B-Cell Lineages" 235th American Chemical Society National Meeting, New Orleans, LA April 2008.

**Kelley, M.D.** "From the Science to the Clinical: Integrating Literature Reviews and Case Studies" 235th American Chemical Society National Meeting, New Orleans, LA April 2008.

## PUBLICATIONS

1. Bridges, L.C. Lingo, J.D. Grandon, R.A., and **Kelley, M.D.** All-*trans*-Retinoic Acid Induces Integrin-independent B-cell Adhesion to ADAM Disintegrin Domains. *Biochemistry* 47: 4544, 2008.
2. **Simms-Kelley, M.D.**, Subramanian, S., Madler, M.M., Patrick, S.D., Klucik, J., Brown, C.W., Liu, S., Lemire, T.D., Benbrook, D.M., Birckbichler, P.J., Berlin, K.D. and Nelson, E.C. Heteroarotinoids Promote Growth in Vitamin A-Deficient Rats. *FASEB J.* 13: 896, 1999.
3. Liu, S. Berlin, K.D., **Simms-Kelley, M.D.**, Nelson, E.C. and Benbrook, D.M. Optimization and Synthesis of (E)-4-[2-(3,4-Dihydro-4,4-dimethyl-2H-1-benzopyran-6-yl)-1-propenyl] benzoic Acid-11-[<sup>14</sup>C]. *J. Labelled Compounds and Radiopharmaceuticals* 42: 789, 1999.
4. **Simms-Kelley, M.D.**, Subramanian, S., Spruce, L.W., Madler, M.M., Patrick, S.D., Grummer, R., Lemire, T.D., Benbrook, D.M., Birckbichler, P.J., Berlin, K.D. and Nelson, E.C. Growth Promoting Activity of Heteroarotinoids in Vitamin A-Deficient Rats. *FASEB J.* 12: 840, 1998.
5. Andersson, L.A., Johnson, A.K., **Simms, M.D.** and Willingham, T.R. Comparative Analysis of Catalases: Spectral Evidence Against Heme-Bound Water for the Solution of Enzymes. *FEBS.* 370: 97, 1995.

## ORGANIZATIONS

American Chemical Society

Project Kaleidoscope Faculty for the 21st Century (PKAL F21)