

Frank W. Abernathy, Ph.D.

PROFILE

Biological Researcher who excels in performing research at the molecular, cellular, and developmental levels. Specific interest in DNA superstructure.

EXPERIENCE BY SPECIALIZATION

Cell Biologist

Twelve years experience including culturing and chromosomal analyses of human fibroblast and amniotic cells; chromium 51 depletion analysis in freshly isolated mouse splenocytes in response to extracellular insult; subsequent analysis of DNA superstructure of a number of cell types using novel techniques involving autoradiography, liquid scintillation, agarose gel electrophoresis, hydroxyapatite batch elution; experience with rodent surgery involving removal of type II lung cells for measuring oxidant stress damage via chromium 51 depletion and changes in intracellular ATP levels and related nucleotides using high performance liquid chromatography (see Abernathy and Pacht, 1995; Pacht and Abernathy, 1995).

Microbiologist & Teaching

Three years experience as a microbiologist including developing and supervising lecture/laboratory microbiology courses and setting up and supervising a private food and water testing microbiological laboratory. Community college experience developing biology and human physiology and anatomy courses with full laboratories on two sister campuses. Graduate teaching associate experience at Ohio State University teaching biology courses. Adjunct faculty experience at Wright State University teaching microbiology and biology senior seminar.

Cardiovascular Toxicologist

Two years experience with in vivo toxicology monitoring cardiovascular response of rats with tailcuff sphygmomanometry and radiotelemetric implants (see Abernathy et al, 1995), including a 3-week monitoring of rats exposed to the Army propellants, modular artillery charge system or ammonium dinitramide.

EDUCATION

- **Ph.D.**, Zoology, Studies in Eukaryotic DNA Superstructure, The Ohio State University, Columbus, OH
- Specialist Degree in Community College Teaching, Arkansas State University, Jonesboro, AR
- **MA**, Bacteriology, University of Arkansas, Fayetteville, AR
- **MS**, Zoology, University of Arkansas, Fayetteville, AR
- **BS**, Zoology, Minor Chemistry, Arkansas State University, Jonesboro, AR

Research Employment

CHILDREN'S MEDICAL CENTER, Dayton, OH

Researcher, Gastroenterology Department

- Performed Ussing Chamber Analysis to detect real-time changes in cell monolayer resistance and ion conduction in response to pharmacologics like epinephrine and in response to infection with EPEC bacteria with and without amelioration from added probiotics (Lactobacilli). PowerPoint presentation at <http://frankabernathy.wordpress.com>.
- Evaluated the effect of neutrophil migration through inverted cell monolayers in response to either an EPEC infection or to chemoattractants like fMLP or cytokines. Radiolabeled neutrophils with indium 111 to quantitate the extent of migration through monolayers. Checked for resistance changes using a two-pronged probe.
- Ran agilent plates in collaboration with Wright State University (Dayton, OH) to detect changes in gene expression in cell monolayers in response to CCR2 receptor stimulation.
- Developed an RT-PCR assay for quantitating 8 probiotic bacteria in a commercial preparation, VSL-3; a vendor, Applied Biosystems, helped in developing first probes and primers for detection. Validated probes and primers and quantitated pure cultures of bacteria to set standards. Tested bacterial DNA from patient stools for VSL-3 bacteria; took three sets of stool samples taken for RT-PCR analysis: week 1 (no VSL), week 4 and week 8 (VSL taken continuously by the patients versus placebo). Performed as a blind study.

MANTECH ENVIRON. TECH., INC., Wright Patt. Air Force Base, Dayton, OH

Researcher

Performed vivo toxicology monitoring cardiovascular response of rats with tailcuff sphygmomanometry and radiotelemetric implants (see Abernathy et al, 1995); included a 3-week monitoring of rats exposed to Army propellants, modular artillery charge system or ammonium dinitramide.

OHIO STATE UNIVERSITY, Columbus, OH

Researcher, Department of Internal Medicine, Pulmonary Division

Modified protocol for culturing of rat lung type II cells. Performed cytotoxic assays using chromium 51 release to determine concentrations and exposure periods necessary for sublethal and lethal injury by oxidants (hydrogen peroxide and hypochlorous acid). Performed Glutathione cycling assay on patient bronchiolar lavage fluid.

Researcher, Department of Veterinary Pathobiology

Utilized ELISA assays, SDS-polyacrylamide gel electrophoresis, silver staining of the gels for visualization of protein bands. Developed protocols for leukocyte migration inhibition assay to detect sensitivity of pig leukocytes to particulate antigens and zymosan and sheep RBC rosetting assays for detecting lymphocyte sensitivity to soluble antigens. Performed worm surveys in the abomasum and intestines, fecal egg counts, and pasture larval counts to determine drug efficacies for various animal parasitic infections.

Researcher, Department of Pathology

Developed protocols for studies on eukaryotic DNA superstructure including the following DNA superstructure assays: gel electroelution, filter alkaline elution, autoradiography of electroeluted DNA, electron microscopy, digestion protocols for HPLC analyses, purification and comparison of matrix and non-matrix DNA superstructures, and characterization of alkaline resistant DNA

associated RNA.

Frank W. Abernathy, Ph.D.

Page 2

Teaching

WRIGHT STATE UNIVERSITY, Dayton, OH

Lecturer: Taught introductory microbiology for non-majors and biology senior seminar.

PROFESSIONAL ORGANIZATIONS

Ohio Valley Branch of the Tissue Culture Association

Ohio Valley Society of Toxicology

PRESENTATIONS

Eukaryotic DNA Superstructure studies, University of Virginia, Charlottesville, VA, 1996

Eukaryotic DNA Superstructure studies, University of North Carolina, Chapel Hill, NC, 1992

Eukaryotic DNA Superstructure studies, University of Nebraska, Omaha, NE, 1989

Eukaryotic DNA Superstructure studies, Clark College, Atlanta, GA, 1989

Evolution Blog

<http://evolution4.wordpress.com>

PATENTS

Abernathy, F. W. 1996. Method and an Apparatus for the Removal of Fibrous Material From a Rotating Shaft, patent # 5,482,562.

Abernathy, F. W. 1995. Fat Removal from Cooked Ground Meat Patties, patent # 5,397,585.

Abernathy, F. W. 1990. Dispensing Method for a Variable Volume Disposable Carbonated Beverage Container, patent # 4,953,750.

Abernathy, F. W. 1982. Solar Energy Conversion Plant, patent # 4,354,117.

Abernathy, F. W. 1977. Garbage Recycling Apparatus, patent # 4,030,670.

Frank W. Abernathy, Ph.D.

Page 3

SCIENTIFIC PAPERS

Paliy O, Kenche H, Abernathy F, Michail S. 2009. High-throughput quantitative analysis of the human intestinal microbiota with a phylogenetic microarray. [Appl Environ Microbiol](#). 75:3572-9.

- Michail, S., Mezoff, E., and F. Abernathy 2005. Roles of selectins in the intestinal epithelial migration of eosinophils. *Pediatric Research* 58:644-647.
- Michail, S. and F. Abernathy 2004. A new model for studying eosinophil migration across cultured intestinal epithelial monolayers. *J. Pediatric Gastroenterology and Nutrition* 39:56-63.
- Michail, S., Halm, D., Abernathy, F. 2003. Enteropathogenic *Escherichia coli* stimulate neutrophil migration across a cultured intestinal epithelium without altering transepithelial conductance. *J Pediatric Gastroenterology and Nutrition* 36(2).
- Michail, S. and F. Abernathy 2003. *Lactobacillus plantarum* inhibits the intestinal transepithelial migration of neutrophils induced by enteropathogenic *Escherichia coli*. *J Pediatric Gastroenterology and Nutrition* 36 (3).
- Michail, S. and F. Abernathy 2002. *Lactobacillus plantarum* reduces the in vitro secretory response of intestinal epithelial cells to enteropathogenic *Escherichia coli* infection. *J. Pediatric Gastroenterology and Nutrition*. 35:350-355.
- Michail, S. and F. Abernathy 2002. Transepithelial migration of HL-60 differentiated eosinophils is induced by enteropathogenic *Escherichia coli* infection. *JPGN* 35(3):423.
- Michail, S., D. Halm, D., Abernathy, F. 2002. Enteropathogenic *Escherichia coli* stimulate neutrophil migration across a cultured intestinal epithelium without altering transepithelial conductance. *JPGN* 35(3):458.
- Michail, S. and F. Abernathy 2002. A novel model for studying transepithelial migration of eosinophils across a cultured intestinal epithelium. *Gastroenterology* 122(4) A151.
- Abernathy, F. W. and C. D. Flemming. 1996. Measurement of cardiovascular response of male sprague dawley rats to modular artillery charge system using radiotelemetric implants. *The Toxicologist* 30:337.
- Abernathy, F., Flemming, C., and W. Sonntag. 1995. Measurement of cardiovascular response in male-sprague-dawley rats using radiotelemetric implants and tailcuff sphygmomanometry: A comparative study. *Toxicol. Meth.*, 5: 89-98.
- Abernathy, F. and E. Pacht. 1995. Alteration of ATP and other cellular nucleotides following sublethal oxidant injury to the rat type II alveolar epithelial cells. *Am. J. Med. Sci.* 309:140-145.
- Pacht, E. and F. Abernathy. 1995. Prevention of intracellular adenosine triphosphate depletion after sublethal oxidant injury to rat type II alveolar epithelial cells with exogenous glutathione and n-acetylcysteine. *Am. J. Med. Sci.* 310:133-137.
- Abernathy, F. W. 1988. *Studies in eukaryotic DNA superstructure*, Ohio State University, Columbus, OH.