

PART A: COVER PAGE

1) Title: *NURTURING INTEREST IN BIOMEDICAL SCIENCE EDUCATION AMONG ELEMENTARY STUDENTS*

2) KEY PERSONNEL

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THT 946 1900 University Blvd.
Birmingham AL 35294-0006
Phone: (205) 934 6086, Fax: (205) 975 7029
EMAIL: jmwyss@uab.edu

Wayne Richardson, Ph.D., Principal, Deer Valley Elementary School
4990 Ross Bridge Parkway
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3) TOTAL FUNDS REQUESTED: \$2000

4) RESPONSIBLE OFFICIAL

Departmental Official – William Alexander Boles II

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UAB Signing Official – Lynn Stedman

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AB 1170 1720 2nd Ave South
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UAB Financial Officer – Debbie Snider

Office of Grants and Contracts Accounting, University of Alabama at Birmingham
AB 990 1720 2nd Ave South
Birmingham AL 35294-0109
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Email: Deb@uab.edu

NURTURING INTEREST IN BIOMEDICAL SCIENCE EDUCATION AMONG ELEMENTARY STUDENTS

CARMEL M. McNICHOLAS-BEVENSEE, J. MICHAEL WYSS AND WAYNE RICHARDSON

PART B: PROJECT DESCRIPTION

This program is focused on engaging the interest of grade 1-4 students in biomedical sciences and thus increasing the potential of these students to learn science and math throughout their K-20 education and eventually to consider careers in the biomedical sciences. Sessions will be offered to students throughout the year, and the results will provide data needed to scale up the program and make it sustainable. Each 1.5 hour session will engage student interest by providing a fast paced, broad spectrum activity in a inquiry-based setting. Each session will enhance learning by presenting information in a variety of ways and incorporating the use of multiple senses – sight, smell, touch and hearing, and it will encourage questions. All activities will incorporate some degree of hands-on participation or active involvement. We will present the basic concepts/first principles in different ways using diverse media. Together with hands-on components mini lectures will be used to reiterate key points. All activities are designed at a basic, age appropriate level and will incorporate elements of anatomy, biochemistry, pathophysiology and physiology. The students will journal their results and gain basic scientific knowledge concerning mechanisms contributing to healthy living.

We begin all sessions by asking the students what the term ‘science’ means. The initial component, ‘dress-the-scientist,’ introduces a degree of levity combined with learning. One boy and one girl will be chosen to dress up – highlighting the fact both boys and girls can become scientists. The outfit used will include a ‘mad scientist’ complete with green-hair, goggles and eyeglasses. We ask what do they think we need to wear in the laboratory and describe the safety component of personal protective equipment in the laboratory. We also bring along items from the laboratory (e.g. pipettors, tubes) that are fun to learn about. Initially, the physiological system of interest (see below) will be presented in a short video followed by an interactive discussion using PowerPoint slides.

For “Heart and Lung”, the children listen to their own hearts and breathing sounds with a stethoscope. To demonstrate how the heart rate increases with exercise, several children will run in place and measure heart rate before, during and after using a pulse oximeter. The chemistry of gas exchange will also be introduced at a basic level. We will discuss how the heart beating helps the blood flow and demonstrate blood pressure by using a digital display blood pressure monitor. Next, we perform a simple ‘lung-o-meter’ experiment and ‘measured’ lung capacity from displacement of volume which was charted on a board. In addition, lung volumes will be measured with a spirometer. Finally, we present an intact trachea, heart and lungs from pig and manually inflate the lungs and dissect open the heart, which they then examine. The children are given small pieces of trachea, heart and lung to examine. We provide both a dissection microscope and magnifying glasses. A mini-torso will be provided and the children will replace the organs, fitting them together like pieces of a puzzle and use ADAM, an interactive physiology software program.

For “Digestive System”, we will demonstrate the length of the small intestine with a piece of rope hidden in a bottle and pulled out by a student. To demonstrate bowel sounds, after drinking a glass of water, the children listen to the liquid entering their stomach with a stethoscope. To demonstrate absorption in the small intestine for the earlier grade students, pre-fill segments of sausage casing (pig intestine) with glucose solution or water alone will be placed in a water bath and glucose test strips will be used to determine which contained the glucose. How glucose is handled by the body will also be introduced, describing how food stuffs are broken down and transported across membranes. The older grade children fill their own casings, and chart their results on the board. Finally we present an intact

rabbit digestive system and give students small pieces of pig esophagus for them to examine. As above, we provide a dissection microscope, magnifying glasses and the ADAM program.

All sessions will have a segment on nutrition and the importance of exercise designed in collaboration with the UAB Weight Management Program using the “Tips from the Good Health Club” from the American Academy of Pediatrics: 5, 2, 1, 0. The children will stretch for ‘Stretch the giraffe says 5 fruits and veggies a day’; hoot like an owl for ‘Hoot the owl advises 2 hours of screen time a day; run in place for ‘Spark says 1 hour of exercise a day’ and finally pretended to drink for ‘Flip the Frog says drink water and 0 sugary drinks’. A game is made as an aid to learning. We have an established collaboration with the Pulmonary Injury and Repair Center at UAB, and as part of that initiative we will also discuss how cigarette smoking is detrimental to ones health. We ask the children to sniff a small, but extremely pungent, vial of cigarette smoke as well as show how the lungs are damaged and how the gastrointestinal tract is affected.

Each child will be provided a ‘goodie bag’ to take home which will contain small prizes, a magazine on healthy eating (“Chop Chop”) provided by UAB Weight Management Program and printed information incorporating the slides the children will see. This is also intended as a means of communication between ourselves and the parents.

NUMBER OF STUDENTS.

Based on collaborations with the schools and our pilot program participation, we anticipate a minimum of 800 students. At Deer Valley, the student body is 13% Asian, 19% African-American, 55% White, 2% Hispanic and 11% of mixed race. Hence the project will target a broad range of cultural backgrounds.

SITE(S) AT WHICH THE ACTIVITY WILL TAKE PLACE.

The primary location will be at Deer Valley Elementary School. We will also recruit from other schools, and have obtained positive responses from several schools. We are targeting both private and public schools that are close to UAB. In an effort to provide our outreach opportunities to economically disadvantaged areas, we are developing a partnership with Blountsville Elementary School, Blountsville AL (primarily rural) and Greenwood Elementary, Bessemer AL (primarily urban minority). Some of the items contained within our budget will be used at multiple locations.

ROLES FOR EACH MEMBER OF THE PARTNERSHIP.

Dr. McNicholas-Bevensee will design the program, with an emphasis on tailoring the sessions to age-appropriate activities. She will contact teachers, recruit volunteers and be primarily responsible for establishing and organizing the schedule of events. Dr. Wyss will consult and provide advice and input into the activities. Dr. Richardson, as Principal, will ensure facilities are made available to us.

METHODS TO ASSESS EFFECTIVENESS OF THE ACTIVITY(S).

A questionnaire will be designed and given out to participating teachers. We will request feedback critiquing the sessions and how we can improve, how they fit in with their curriculum and grade level appropriateness.

FUTURE PLANS

We are committed to expanding our outreach efforts in association with the UAB Center for Outreach Development (UAB CORD, Dr. Wyss - Director) to elementary school children. As mentioned above we have an established collaboration with the Pulmonary Injury and Repair Center and CORD. This grant will allow us to supplies that will be used in these and future iterations of this program.

PART C. SUPPORTING MATERIALS

KEY PERSONNEL

Carmel M. McNicholas-Bevensee – Biosketch

J. Michael Wyss – Biosketch

Wayne O. Richardson – Resume

LETTERS OF SUPPORT

Letter of support – Wayne O. Richardson

BUDGET

| | |
|--|---------------|
| Blood pressure monitors (4) | \$200 |
| Anatomical Torso model (2) | \$300 |
| Spirometers plus disposable mouthpieces (2 units) | \$400 |
| Finger pulse oximeter (3) | \$100 |
| ADAM Interactive Physiology | \$150 |
| Consumables (gloves, paper products, gussy aprons, disinfecting wipes) | \$450 |
| Printing and handout supplies | \$300 |
| Travel (collect organs from meat processor for organs) | \$100 |
| TOTAL: | \$2000 |

BIOGRAPHICAL SKETCH

| | |
|--|----------------|
| NAME McNicholas-Bevensee, Carmel Mary | POSITION TITLE |
| eRA COMMONS USER NAME cbevensee | Instructor |

| EDUCATION/TRAINING | | | |
|--|----------------------------------|-----------|----------------|
| INSTITUTION AND LOCATION | DEGREE <i>(if applicable)</i> | MM/YY | FIELD OF STUDY |
| University of Manchester, Manchester, U.K. | B.Sc. (Honors) | 1989 | Physiology |
| University of Manchester, Manchester, U.K. | Ph.D. | 1992 | Physiology |
| Yale University, New Haven, CT | Postdoctoral | 1992-1998 | Physiology |

A. Personal Statement

I have a long standing interest in ion channel regulation. My research focuses on the impact of inflammation and tissue remodeling on the electrophysiological profile of cardiac myocytes and airway cells. Studies include examining the effect and underlying causes of cellular electrophysiological changes in the failing heart and the effects of release of inflammatory mediators on CFTR ion channel function in airway cells.

Positions and Honors

Professional Experience

Sept. 1989 to July 1992: Research Associate in the Department of Medicine at Manchester University, Manchester, UK.

August 1992 to April 1998: Postdoctoral Fellow/Associate in the Department of Cellular and Molecular Physiology at Yale University, New Haven, CT.

April 1998 to July 2000: Research Investigator II in the Department of Metabolic and Cardiovascular Drug Discovery at Bristol-Myers Squibb Pharmaceutical Research Institute, Princeton, NJ.

Sept. 2000 to March 2012: Instructor in the Department of Physiology and Biophysics, University of Alabama at Birmingham, Birmingham, AL.

March 2012 to present: Instructor in the Department of Cell, Developmental and Integrative Biology, University of Alabama at Birmingham, Birmingham, AL.

Honors and Awards

1994: National Kidney Foundation Fellowship
 1994: American Heart Association Fellowship

- 1995: American Society of Nephrology travel grant to the International Society of Nephrology (Madrid, Spain)
- 1995: American Society of Nephrology and National Kidney Foundation award for excellence in research

B. Selected Peer-reviewed Publications (from a total of 27 published articles, * denotes corresponding author)

1. **McNicholas, C.M.**, Wang, W.H, Ho, K., Hebert, S.C. and Giebisch, G. (1994) Regulation of ROMK1 K⁺ channel activity involves phosphorylation processes. Proc Natl Acad Sci U S A 91, 8077-81. PMCID: 8058760
2. **McNicholas, C.M.**, Guggino, W.B., Schwiebert, E.M., Hebert, S.C., Giebisch, G. and Egan, M.E. (1996) Sensitivity of a renal K⁺ channel (ROMK2) to the inhibitory sulfonylurea compound glibenclamide is enhanced by coexpression with the ATP-binding cassette transporter cystic fibrosis transmembrane regulator. Proc Natl Acad Sci U S A 93, 8083-8. PMCID: 8755607
3. **McNicholas, C.M.**, Yang, Y., Giebisch, G. and Hebert, S.C. (1996) Molecular site for nucleotide binding on an ATP-sensitive renal K⁺ channel (ROMK2). Am J Physiol 271, F275-85. PMCID: 8770158
4. **McNicholas, C.M.** and Canessa, C.M. (1997) Diversity of channels generated by different combinations of epithelial sodium channel subunits. J Gen Physiol 109, 681-92. PMCID: 9222895
5. **McNicholas, C.M.**, Nason, M.W. Jr., Guggino, W.B., Schwiebert, E.M., Hebert, S.C., Giebisch, G. and Egan, M.E. (1997) A functional CFTR-NBF1 is required for ROMK2-CFTR interaction. Am J Physiol 273, F843-8. PMCID: 9374850
6. **McNicholas, C.M.**, MacGregor, G.M., Islas, L.D., Yang, Y., Hebert, S.C. and Giebisch, G. (1998) pH-dependent modulation of the cloned renal K⁺ channel, ROMK. Am J Physiol 275, F972-81. PMCID: 9843915
7. Hardiman, K.M., **McNicholas-Bevensee, C.M.**, Fortenberry, J., Myles, C.T., Malik, B., Eaton, D.C. and Matalon, S. (2004) Regulation of amiloride-sensitive Na⁽⁺⁾ transport by basal nitric oxide. Am J Respir Cell Mol Biol 30, 720-8. PMCID: 14607816
8. Hickman-Davis, J.M., **McNicholas-Bevensee, C.M.**, Davis, I.C., Ma, H.P., Davis, G.C., Bosworth, C.A. and Matalon, S. (2006) Reactive species mediate inhibition of alveolar type II sodium transport during mycoplasma infection. Am J Respir Crit Care Med 173, 334-44. PMCID: 16254273
9. McAlear, S.D., Liu, X., Williams, J.B., **McNicholas-Bevensee, C.M.** and Bevensee, M.O. (2006) Electrogenic Na/HCO₃ cotransporter (NBCe1) variants expressed in Xenopus oocytes: functional comparison and roles of the amino and carboxy termini. J Gen Physiol 127, 639-58. PMCID: 16735752
10. **McNicholas-Bevensee, C.M.***, DeAndrade, K.B., Bradley, W.E., Dell'Italia, L.J., Lucchesi, P.A. and Bevensee, M.O. (2006) Activation of gadolinium-sensitive ion channels in cardiomyocytes in early adaptive stages of volume overload-induced heart failure. Cardiovasc Res 72, 262-70. PMCID: 16959228
11. Wu, J., **McNicholas, C.M.** and Bevensee, M.O. (2009) Phosphatidylinositol 4,5-bisphosphate (PIP₂) stimulates the electrogenic Na/HCO₃ cotransporter NBCe1-A expressed in Xenopus oocytes. Proc Natl Acad Sci U S A 106, 14150-5. PMCID: 19667194
12. **McNicholas, C.M.** and Berecek, K.H. (2009) Mammalian target of rapamycin: MasTOR mediator of cellular changes in pathological states? Hypertension 54, 1221-2. PMCID: 19884561

13. Kapoor, N., Lee, W., Clark, E., Bartoszewski, R., **McNicholas, C.M.**, Latham, C.B., Bebok, Z., Parpura, V., Fuller, C.M., Palmer, C.A. and Benos, D.J. (2011) Interaction of ASIC1 and ENaC subunits in human glioma cells and rat astrocytes. *Am J Physiol Cell Physiol* 300(6) C1246-59. PMID: 21346156
14. Rooj, A.K., **McNicholas, C.M.**, Bartoszewski, R., Bebok, Z. Benos, D.J. and Fuller, C.M. (2012) Glioma specific cation conductance regulates migration and cell cycle progression. *J Biol Chem* 287(6): 4053-65. PMID: PMC3281704
15. Blount A.C., **McNicholas, C.M.**, Zhang, S., Skinner, D.F, Chestnut, M., Kappes, J.C., Sorscher, E.J., and Woodworth B.A. Resveratrol Enhances Airway Surface Liquid Depth by Increasing CFTR Channel Open Probability. In press, *Laryngoscope*.

C. Research Support

Ongoing Research Support

NIH 5R01 DK037206-23 Fuller (PI) 3.6 PM 8/01/2010 – 7/31/2015
\$300,948

Sodium Entry into Amiloride-Sensitive Epithelia

Role: Co-Investigator

My role in this proposal is to study the electrophysiological characteristics of amiloride-sensitive sodium channels that result, in part, from different combinations of subunits of the Degenerin (DEG)/ENaC superfamily of ion channels

NIH 2P30 DK072482-06 Sorscher (PI) 3.6 PM 5/01/2012 – 4/30/2016
\$1,099,084

UAB CF Research and Translation Core Center

Role: Co-Investigator

My role in this project is to provide electrophysiology support to multiple investigators studying CFTR function as part of the cell model and assay core (Core A, Kirk, K.L., Director).

NIH 5R01 HL102371-03 Gaggar (PI) 1.8 PM 7/2/2010 – 5/31/2015
\$341,090

A Novel Proteolytic System of Pulmonary Inflammation

Role: Co-Investigator

My role in this project is to assess the impact of inflammatory mediators on CFTR function using electrophysiological techniques.

Completed Research Support

UAB Faculty Development Award (McNicholas-Bevensee, C.M. P.I) 8/15/2009-8/14/2010
Title: Improved methodology to study stretch activated ion channels in cultured and acutely isolated myocytes

The major goal of this project was to develop and optimize a technique to manually stretch cardiac myocytes to enable the study of stretch activated ion channels and their potential role in the development of heart failure.

Role: PI

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors. Follow this format for each person. **DO NOT EXCEED FOUR PAGES.**

| NAME J. Michael Wyss | | POSITION TITLE Professor | |
|--|----------------------------------|-----------------------------|----------------|
| eRA COMMONS USER NAME jmwys jmwys | | | |
| EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)</i> | | | |
| INSTITUTION AND LOCATION | DEGREE <i>(if applicable)</i> | MM/YY | FIELD OF STUDY |
| Concordia College, Fort Wayne, IN | BS | 05/1970 | Psychology |
| Lutheran School of Theology, Chicago, IL | MDiv | 05/1974 | Counseling |
| Washington University, St. Louis, MO | PhD | 05/1976 | Neurobiology |
| Washington University, St. Louis, MO | Postdoc | 09/1979 | Neurobiology |

A. Personal Statement

Michael Wyss is Director of the UAB Center for Community Outreach Development (CORD), and thereby directs much of the University’s K-12 STEM education outreach, and he developed several new programs and expanded previously successful programs. Further, Dr. Wyss has formed outstanding alliances with all of the area school districts. Dr. Wyss has focused CORD on empowering K-12 science, math and technology education, especially for underrepresented and minority students, in large part, by providing their teachers the requisite knowledge base and effective, inquiry-based tools to educate their students. Dr. Wyss’s biomedical research focuses on two major areas. The first research focus is on neuronal plasticity and grows out of his studies demonstrating that a specific group of pyramidal neurons in the rat retrosplenial cortex displays a dramatic alteration in their structure as the animal ages. Concurrent with these changes in structure, they have demonstrated that cellular, molecular and behavioral changes occur, including a significant decrease in spatially learning. The second research focus is on the mechanisms by which the hypothalamus regulates blood pressure in salt-sensitive individuals. This work has recently focused on the ability of polyphenols to blunt hypertension. These studies employ cellular and molecular techniques, transgenic manipulations in mouse, neural recordings, nerve pathway tracing and plasticity measures, biochemical analyses, MS/MS, FRAP/FRET, etc. This work is currently most focused on the ability of puerarin to blunt metabolic disease components, especially the ability of this polyphenol to regulate lipid metabolism and insulin sensitivity.

B. Positions and Selected Honors:

- 2004-Present Director of the Center for Community OutReach Development, UAB
- 1997-Present Associate Director of the Alzheimer's Disease Research Center, UAB
- 1992-1998 Chairman of the Graduate Neuroscience Training Program, UAB
- 1988-Present Professor of Cell, Developmental and Integrative Biology, Cardiology, Medicine, Neurobiology and Psychology, UAB
- 2008-Present Senior Scientist Center for Neurodegenerative Disease Research
- 2006- Present Senior Scientist Center for Glial Biology in Medicine
- 2000- Present Senior Scientist Purdue/UAB Botanicals Research Center, Co-director, 2003-
- 1980- Present Senior Scientist Vascular Biology and Hypertension Program, UAB research Support
- 2006-Present Member American College of Laboratory Animal Medicine: Government Relations Committee

1982-Present Member American Heart Association (Fellow Council for High Blood Pressure Research, Program Committee, 1992-1997, Publications Committee, 2002-, Leadership Committee, 2009-, AHA Ambassador to Congress, 2009-, Member AHA Peer Review Oversight Committee, 2010-).

1985-Present Member American Physiological Society (Steering Committee for CNS Section (member 1998-; Secretary/Treasurer 1999-2003), Program Committee Chair 1998-2003; Chair, CNS Section (2003-2005), Section Advisory Committee (2003-2005); Education Committee, 2005-2006; Councilor, 2006-2009; Member Education and Animal Care and Experimentation Committees, 2009-).

2000-Present Member Association For Assessment and Accreditation of Laboratory Animal Care International (Consultant, Specialist, 1998-2004; Member of Council 2004-; Officer of Council 2009-2012).

1999-2003 Experimental Biology Joint Programming Committee

1992-2000 National Board of Examiners in Optometry (Test Construction Committee, Member 1992- Co-chair, 1996-1998, Chair 1998-2000).

2009-2011 National Academy of Science, Institute of Lab Animal Medicine, Program Committee

2012 Gardner Wright Award as Alabama Scientist of the Year.

C. Selected Peer Reviewed Publications (from >200)

- Radbill AE, Reddy AT, Markert JM, Wyss JM, Pike MM, Akella NS, Bharara N, Gillespie GY. Effects of G207, a conditionally replication-competent oncolytic herpes simplex virus, on the developing mammalian brain. *J Neurovirol.* 2007; 13(2):118-29. PMID: 17505980
- Cho TM, Peng N, Clark JT, Novak L, Roysommuti S, Prasain J, Wyss JM. Genistein attenuates the hypertensive effects of dietary NaCl in hypertensive male rats. *Endocrinology.* 2007; 148(11):5396-402. PMID: 17673523
- Weaver CM, Barnes S, Wyss JM, Kim H, Morr e DM, Morr e DJ, Simon JE, Lila MA, Janle EM, Ferruzzi MG. Botanicals for age-related diseases: from field to practice. *Am J Clin Nutr.* 2008; 87:493S-7S. PMID: 18258645
- Carlson S, Peng N, Prasain JK, Wyss JM. Effects of botanical dietary supplements on cardiovascular, cognitive, and metabolic function in males and females. *Gend Med.* 2008; 5:S76-90. PMID: 18395685
- Isbell TS, Sun CW, Wu LC, Teng X, Vitturi DA, Branch BG, Kevil CG, Peng N, Wyss JM, Ambalavanan N, Schwiebert L, Ren J, Pawlik KM, Renfrow MB, Patel RP, Townes TM. SNO-hemoglobin is not essential for red blood cell-dependent hypoxic vasodilation. *Nat Med.* 2008;14:773-7. PMID: 18516054
- Carlson SH, Wyss JM. Neurohormonal regulation of the sympathetic nervous system: new insights into central mechanisms of action. *Curr Hypertens Rep.* 2008; 10:233-40. PMID: 18765096
- Prasain JK, Peng N, Moore R, Arabshahi A, Barnes S, Wyss JM. Tissue distribution of puerarin and its conjugated metabolites in rats assessed by liquid chromatography-tandem mass spectrometry. *Phytomedicine.* 2009; 16:65-71. PMID: 19027277
- Roysommuti S, Lerdweeraphon W, Malila P, Jirakulsomchok D, Wyss JM. Perinatal taurine alters arterial pressure control and renal function in adult offspring. *Adv Exp Med Biol.* 2009;643:145-56. PMID: 19239145
- Peng N, Prasain JK, Dai Y, Moore R, Arabshahi A, Barnes S, Carlson S, Wyss JM. Chronic dietary kudzu isoflavones improve components of metabolic syndrome in stroke-prone spontaneously hypertensive rats. *J Agric Food Chem.* 2009; 57:7268-73. PMID: 19938872
- Prasain JK, Arabshahi A, Moore DR 2nd, Greendale GA, Wyss JM, Barnes S. Simultaneous determination of 11 phytoestrogens in human serum using a 2 min liquid chromatography/tandem mass spectrometry method. *J Chromatogr B Analyt Technol Biomed Life Sci.* 2010; 878:994-1002. PMID: 20346741
- Su J, Sripanidkulchai K, Wyss JM, Sripanidkulchai B. Curcuma comosa improves learning and memory function on ovariectomized rats in a long-term Morris water maze test. *J Ethnopharmacol.* 2010; 130:70-75. PMID: 20420894
- Lu R, Chen Y, Cottingham C, Peng N, Jiao K, Limbird LE, Wyss JM, Wang Q. Enhanced Hypotensive, Bradycardia and Hypnotic Responses to α 2-adrenergic Agonists in Spinophilin Null Mice Are Accompanied by Increased G Protein Coupling to the α 2AAR. *Mol Pharmacol.* 2010; 78:279-286. PMID: 20430865

Program Director/Principal Investigator (Last, First, Middle):

Carlson, S.H. and J.M. Wyss. Mechanisms Underlying Hypertension and Obesity. *Hypertension*, 57:375-378, 2011. PMID:21263117

Jirakulsomchok D, N. Soikhama, N. Kunbootsria, P. Wannanonda, T. Suttituma, T. Tongoona, S. Roysommuti and J.M. Wyss. Impaired renal response to portal infusion of hypertonic saline in adriamycin-treated rats. *Clin. and Exper. Pharm. and Physiology*, in Press, 2012, "PMC Journal - In Process."

Roysommuti, S and J. M. Wyss. Taurine exposure effects on arterial pressure control. *Bioactive Foods in Chronic Disease States*, *Clin. Medicine*. in Press, 2012, "PMC Journal - In Process."

D. Research Support

Ongoing Research Support

R25RR022745 Wyss (PI) 4/1/06-3/31/13
Birmingham Science Education Partnership: Middle School Inquiry-Based Learning" is to advance science education by inquiry-based methods in the Birmingham City Schools middle school program.
Role: PI

AMSTI-UAB AWARD Wyss (PI) 10/1/06-9/31/15
Alabama Math, Science and Technology Initiative (AMSTI-UAB) advances science and math education through inquiry-based methods in all North Jefferson County schools (~90,000 students). It provides intense training to about 3,000 science and math teachers and kits/modules that are the core of the education.
Role: PI

ACHE-UAB2 Wyss (PI) 4/1/04-3/31/14
This Alabama Commission on Higher Education grant funds the University-school Partnership for science education to advance science and math education through training area high school teachers in inquiry-based methods for teaching cellular and molecular biology.
Role: PI

DRL-0737703 Wyss (PI) 1/1/08-12/31/12
UAB-Birmingham Consortium for Advanced Education in Computer Science advances linear algebra and computer visualization education through inquiry-based methods in minority and underserved high schools.

This grant is in a NCE and will not be renewed by Dr. Wyss. He has charged another faculty member (Co-PI on the original grant) in Computer Sciences with submission of a scale up of this project, and Dr. Wyss will only be involved as an as needed consultant.
Role: PI

CNS0940564 Wyss (PI) 3/01/10-2/28/14
BPC-DP: A Multi-tiered Mentoring Model (M3) for Increasing Minority and Women Participation in Computing is a teach to learn to teach program in which college, high school and middle school students learn and teach computer programming via "Alice."
Role: PI

Alabama U000168 Wyss (PI) 7/01/10-9/30/14
Alabama Science in Motion-UAB is an education grant for high school physics, chemistry and biology. Dr. Wyss coordinates the program site at UAB and serves as a science consultant to the State Department of Education on the program.
Role: PI

DUE 1136327

Wyss (PI)

8/1/11-7/31/16

Collaboration for Excellence in Science and Math Education (CESAME) is a program to recruit and train a cadre of STEM majors into secondary education careers. It includes formal education and informal training in summer programs and in school year outreach experiences.

Role: PI

P30NS057098

Roth (PI)

10/1/06-7/31/12

For the "Neuroscience Blueprint Core Facility" I run the In Vivo Phenotyping Core which is a service core for cardiovascular and behavioral phenotyping of transgenic mice.

Role: Core Leader

P01AG010836-11

Landfield (PI)

9/01/04 - 8/31/12

Calcium Regulation in Brain Aging and Alzheimer's Disease is centered on the use of APP/PS1 transgenic mice to test the importance of beta amyloid in calcium dysregulation in AD.

Role: Project Leader

P30 NS047466PI

Hablitz (PI)

7/01/05 - 06/3/15

In the UAB Neuroscience Core Grant, Core A will assess the neuro-behavior of both rats and mice in standardized test batteries. This is a core open to any UAB investigator funded by NINDS.

Role: Core Leader

Recently Completed Research Support

P50AT000477

Weaver (PI)

4/01/05-3/31/12

JM Wyss Project Director Project 2, "Cardio- and neuroprotective effects of kudzu polyphenols" The purpose of this grant is to support a basic research center that organizes and maintains a multi-disciplinary program for experimental research on botanicals as dietary supplements and serves as a national resource on botanical authentication, training, and consumer education. The purpose of project 2 is to determine the mechanisms underlying the cardio- and neuroprotective effects of kudzu polyphenols in aging female mice.

Role Project Leader

WAYNE O. RICHARDSON
(205) 663-9268
1505 Colonial Court
Alabaster, Alabama 35007

EXPERIENCE HIGHLIGHTS

2003 - 2012

Samford University, Homewood, AL

ADJUNCT PROFESSOR

1999-Present

DEER VALLEY ELEMENTARY, Hoover, AL

PRINCIPAL

1997- 1999

BERRY MIDDLE SCHOOL, Hoover, AL

ASSISTANT PRINCIPAL

1993 - 1997

ROCKY RIDGE ELEMENTARY SCHOOL, Hoover, AL

ASSISTANT PRINCIPAL

1992 - 1993

HARRIETTE GWIN ELEMENTARY SCHOOL, Hoover, AL

ADMINISTRATIVE INTERN/SCIENCE SPECIALIST

1987 – 1992

GREEN VALLEY ELEMENTARY, Hoover, AL

FIFTH AND SIXTH GRADE TEACHER

EDUCATION

1996-2001 Samford University

Birmingham, AL

DOCTOR OF EDUCATION– EDUCATIONAL LEADERSHIP

1991 -1992 University of Alabama in Birmingham, Birmingham, AL

A CERTIFICATION IN SCHOOL ADMINISTRATION

1987 - 1993 University of Alabama in Huntsville, Troy State University, and Livingston University
Ten hours of graduate studies in Science Education.

1986 - 1987 Samford University, Birmingham, AL

MASTER OF SCIENCE - ELEMENTARY EDUCATION

1984 - 1985 Southern Baptist Seminary, Louisville, KY

Three semesters of graduate studies - Social Work

1978 - 1982 Samford University, Birmingham, AL

BACHELOR OF SCIENCE - RELIGIOUS EDUCATION

Minor - Psychology

Deer Valley Elementary School

4990 Ross Bridge Parkway

Hoover, AL 35226

Phone: (205) 439 3300 Fax: (205) 439 3301

Wayne Richardson, Principal

July 11, 2012

Dear Committee Members:

I am writing this letter of very strong support of a partnership between UAB and Deer Valley Elementary School for an American Society for Biochemistry and Molecular Biology (ASBMB) HOPES seed grant.

Deer Valley Elementary has been involved in the American Physiological Society PhUn (Physiology Understanding) week activities with Drs. McNicholas-Bevensee and Wyss since 2010. Since the first year the activities were held at our school teacher interest has increased and last year we had over 660 students participating in activities over the course of two weeks. I am delighted to say I have received a great deal of positive feedback from teachers, students and parents. I fully support these outreach endeavors and promote the use of Dr. McNicholas-Bevensee's program as a model for our own annual Science Olympiad.

The UAB led program is straight forward, expectations were clearly laid out, and the organization of the event was outstanding. Students were fully engaged in hands-on minds-on science throughout the entire lesson time. Many UAB faculty, post and pre-doctoral scholars and staff volunteered their time and it was clear they loved both exploring science and teaching children.

The activities serve a number of purposes: (1) It reminds students that learning about science is no substitute for learning to do science, (2) It reminds students that the community sees the importance of science education even at the elementary level, and (3) It gives the students an opportunity to relate to caring adults who demonstrate an interest in their future. Furthermore, we have all ethnicities represented in the student body including 39% minority students.

We are fortunate at Deer Valley to have a dedicated science laboratory to which the UAB faculty will have full access. As Principal, I give my approval for participation for all teachers who wish to do so. If granted, funding would allow a comparable number of participants again this year.

In summary, I fully support the further development of a partnership between UAB and Deer Valley Elementary School aimed at promoting the interest of students in basic science education.

Sincerely yours,

A handwritten signature in black ink that reads "Wayne Richardson". The signature is fluid and cursive, with a long horizontal flourish at the end.

Wayne Richardson, Ph.D.
Principal