

NADEJDA I. BOZADJIEVA

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Ann Arbor, Michigan 48105
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EDUCATION

Doctor of Philosophy, July 2011-present
Program: **Cellular and Molecular Biology**
University of Michigan; Ann Arbor, Michigan

Master of Science, June 2011
Program: **Integrated Biosciences**
Track: **Cell, Molecular and Physiological Biology**
University of Minnesota; Twin Cities, Minnesota
Department of Physiology and Pharmacology
University of Minnesota Medical School-Duluth; Duluth, MN

Bachelor of Science, May 2009
Major: **Cell and Molecular Biology** Minors: **Chemistry and Psychology**
University of Minnesota Duluth; Duluth, Minnesota

College Credits as a High School Student, 2004-2005
Winona State University and St. Mary's University; Winona, Minnesota

HONORS AND AWARDS

NIH Cellular and Molecular Biology Training Grant T32-GM007315; Cellular and Molecular Biology Graduate Program, University of Michigan 2012
Rackham Merit Fellowship, Rackham Graduate School; University of Michigan, 2011
American Physiological Society Carolyn tum Suden/Francis A. Hellebrandt Professional Opportunity Award; Experimental Biology, 2010
Graduate School Travel Award; University of Minnesota, 2010-2011
Dean's List for Academic Excellence, Swenson College of Science and Engineering; University of Minnesota Duluth, 2008
Hiawatha Education Foundation Scholarship; Winona, Minnesota, 2005-2009
Strive for Leadership Scholarship; Winona, Minnesota, 2005

PROFESSIONAL SOCIETIES

American Physiological Society: Water and Electrolyte Homeostasis Section, Cardiovascular Section & Cell and Molecular Physiology Section, 2009-present
Society for Experimental Biology and Medicine, 2010-present

GRADUATE RESEARCH

Ph.D. Thesis: **The Role of Akt and mTORC1 Signaling in the Regulation of Alpha Cell Function and Mass**

Advisor: Ernesto Bernal-Mizrachi, M.D.

Project Description: Type 2 Diabetes (T2D), characterized by defective adaptation of β -cells to insulin resistance, is becoming a rapidly growing epidemic currently affecting millions of patients worldwide. Most of the research effort has focused on elucidating the physiological, molecular, and genetic components of β -cell dysfunction and insulin secretion, presenting diabetes as a unihormonal disorder. Contrary to this current approach, clinical data and animal experiments have shown that increased glucagon secretion by the pancreatic α -cells contributes greatly and exacerbates the hyperglycemic state in advanced T2D. The signal transduction events regulating the secretory function of α -cells in normal physiological conditions or the diabetic state remain largely unclear. Therefore, our current projects are focused on understanding intracellular signaling mechanisms, which we believe play a major role in the regulation of glucagon secretion and cell mass.

M.S. Thesis: **Insulin-like Growth Factors and Placental Ischemia-Induced Hypertension in the Pregnant Rat**

Advisor: Jean F. Regal, Ph.D.

Project Description: Preeclampsia is a gestational condition characterized by new onset hypertension and proteinuria and often results in fetal growth restriction. This pregnancy-specific condition occurs in ~8 percent of live birth pregnancies and is a leading cause of maternal and neonatal mortality and morbidity. Delivery is the primary therapeutic approach for preeclampsia; hence, the long-term goal of preeclampsia research is to determine what causes preeclampsia and to find treatments to alleviate maternal hypertension in order to extend pregnancy and improve fetal outcome. Chronic placental ischemia *via* the reduced uteroplacental perfusion pressure (RUPP) model, utilized in this project to mimic the preeclamptic condition during the third trimester in the pregnant rat, results in hypertension, intrauterine growth restriction and fetal loss. Insulin-like Growth Factors (IGF-1 and IGF-2) have been reported to play an important role in fetal development. In addition, low plasma levels of IGF-1 have been associated with reduced endothelial function and have been closely linked with elevated blood pressure in non-pregnant subjects. The hypotheses tested in this project are that 1) placental ischemia induced by RUPP decreases circulating and placental levels of IGF-1 and IGF-2; and 2) administering exogenous IGF-1 in RUPP rats attenuates maternal hypertension, endothelial dysfunction, intrauterine growth restriction and fetal loss. The data show that chronic placental ischemia decreases circulating IGF-2 levels, but does not affect circulating IGF-1 or placental IGF-1, IGF-2 and IGF-1 receptor levels. Further, administering exogenous IGF-1 in RUPP rats during the third trimester attenuates blood pressure and decreases fetal loss, but does not improve endothelial function or fetal weight. Overall, these studies determined that the mechanisms that regulate IGF signaling are potential targets for improved therapies for treating maternal blood pressure in preeclampsia and gestational hypertension.

UNDERGRADUATE RESEARCH

Undergraduate Research Assistant, Undergraduate Research Opportunities Program (UROP)

Advisor: Dr. Randall E. Hicks

Project Thesis: **Changes in the Nitrification Rate during Late Summer and Fall in Lake Superior**

University of Minnesota Duluth, Department of Biology; 2007- 2009

Project Description: To provide valuable information about the role of microbial domains in the aquatic nitrogen cycle of Lake Superior, the rate of nitrification was measured in water samples collected at different depths in Lake Superior. The nitrification rate was measured by the incorporation of [¹⁴C] bicarbonate into the biomass of ammonia-oxidizing euacteria and archaeobacteria.

Undergraduate Research Assistant

Advisor: Dr. Randall E. Hicks

Project: **Microbiologically Influenced Corrosion**

University of Minnesota Duluth, Department of Biology; Summer 2008

Work Description: Responsibilities and research experience in this project included assisting with field work, DNA extraction and analysis, PCR, microscopy, electrochemistry and preparing Iron Sulfide Gradient tubes to inoculate iron-oxidizing bacteria.

MASTER OF SCIENCE THESIS

Nadejda Bozadjieva. Insulin-like Growth Factors and Placental Ischemia-Induced Hypertension in the Pregnant Rat. (2011) Proquest

PEER-REVIEWED PUBLICATIONS

Alaina Heltemes, Anne Gingery, Emma LB Soldner, **Nadejda Bozadjieva**, Kristen Jahr, Britt Johnson, Jeffrey S. Gilbert. Chronic placental ischemia alters amniotic fluid milieu and results in impaired glucose tolerance, insulin resistance and hyperleptinemia in young rats. *Exp Biol Med*. 2010 Jul 1; 235(7):892-9; PMID: 20558843

Anne Gingery, Emma LB Soldner, Alaina Heltemes, Adam Nelson and **Nadejda Bozadjieva**. Developmental programming of the kidney: does sex matter? *J Physiol*. 2009 Dec 1; 587 (Pt 23):5521-2; PMID:19959551

Jennifer. O. Liang, Katie Abata, Eric Bachelder, Becca Bartley, **Nadejda Bozadjieva**, *et.al*. Original research in the classroom: Why do zebrafish spawn in the morning? *Zebrafish* 2011 Dec 8; (4):191-202; PMID:22181662

REVIEWS

Nadejda Bozadjieva, John A. Williams, Ernesto Bernal-Mizrachi. (2013) Molecule Page: Glucagon. The Pancreapedia. www.pancreapedia.org

ABSTRACTS

- Nadejda Bozadjieva**, George K. Gittes, Ernesto Bernal-Mizrachi. (2013) Loss of mTOR Complex 1 signaling in pancreatic α -cells prevents fasting-induced hypoglycemia. Cellular and Molecular Graduate Program Symposium; University of Michigan, Ann Arbor, MI.
- Emilyn U. Alejandro, Sarah Abdulhamid, **Nadejda Bozadjieva**, Doga Kumusoglu, Rebecca Barbaresso and Ernesto Bernal-Mizrachi. (2013) Pancreatic beta-cell deletion of O-linked N-acetylglucosamine Transferase causes Type 2 Diabetes in mice. Midwest Islet Club; Ann Arbor, MI and Islet Society Meeting; Vancouver, BC.
- Emilyn U. Alejandro, Taylor Wallen, Cecilia Jang, **Nadejda Bozadjieva**, Josh Scheys, and Ernesto Bernal-Mizrachi. (2013) Levels of mTOR Complex-1 Activation in Pancreatic Beta-cells Determine Responses to Diabetogenic Conditions. Midwest Islet Club. Ann Arbor, MI.
- Emilyn U. Alejandro, Daniel Meister, Taylor Wallen, Rebecca Barbaresso, Sarah Abdulhamid, **Nadejda Bozadjieva** and Ernesto Bernal-Mizrachi. (2013) Pancreatic Beta-cell Over-expression of Kinase-dead mechanistic Target of Rapamycin (KD-mTOR) Mutant Impairs Glucose Homeostasis by Regulation of Insulin Secretion. Midwest Islet Club. Ann Arbor, MI.
- Nadejda Ivanova Bozadjieva**, Anne Gingery, Britt K Johnson, Ashley J Bauer, Jean F Regal. (2011) The Effect of Insulin-like Growth Factor (IGF-I) Infusion on Placental Ischemia-Induced Hypertension and Fetal Loss During Pregnancy in the Rat. Experimental Biology. Washington, DC. *FASEB J.* 25, 1029.7
- Sarah Chasson, Christopher T Banek, Ashley Bauer, Britt Johnson, **Nadejda Bozadjieva**, Anne Gingery, Jeffrey Gilbert. (2010) Effects of exercise on expression of monocarboxylate transporters during pregnancy in the rat. American Biomedical Research Conference for Minority Students (ABRCMS). Charlotte, NC.
- Nadejda Bozadjieva**, Anne Gingery, Britt K Johnson, Christopher T Banek, Jeffrey S Gilbert. (2010) Infusion of Recombinant IGF-I Reduces Oxidative Stress and Attenuates Placental Ischemia-Induced Hypertension During Pregnancy in the Rat. 7th Annual Women's Health Research Conference, Powell Center for Women's Health; University of MN Twin Cities. Minneapolis, MN.
- Christopher T Banek, **Nadejda I Bozadjieva**, Britt K Johnson, Ashley Bauer, Jeffrey S Gilbert. (2010) Exercise and the Attenuation of Hypertension and Preeclamptic Symptoms Induced by Placental Ischemia in the Rat Model. 7th Annual Women's Health Research Conference, Powell Center for Women's Health; University of MN Twin Cities. Minneapolis, MN.
- Ashley Bauer, Britt K Johnson, **Nadejda Bozadjieva**, Sarah Chasson, Jeffrey S Gilbert. (2010) Placental Ischemia-Induced Hypertension and Fetal Growth Restriction in the rat: Role of Heme Oxygenase-1. 7th Annual Women's Health Research Conference, Powell Center for Women's Health; University of MN Twin Cities. Minneapolis, MN.

Alaina Heltemes, Emma L. B. Soldner, **Nadejda Bozadjieva**, Anne Gingery, Jeffrey S Gilbert. (2010) Hyperleptinemia and glucose intolerance in rat offspring with long-term placental insufficiency. *FASEB J.* 24, 1035.10

Nadejda Ivanova Bozadjieva, Emma L B Soldner, Alaina Heltemes, Anne Gingery, Jeffrey S Gilbert. (2010) Chronic placental ischemia decreases insulin-like growth factor-1 during late gestation in the rat. *FASEB J.* 24,786.14

Gilbert JS, Bahe EL, Heltemes A, **Bozadjieva N.** (2009) Hyperleptinemia And Insulin Resistance In Rat Offspring Exposed To Placental Ischemia And Maternal Hypertension During Late Gestation. *Hypertension.* 54(4):E109.

Nadejda I Bozadjieva, Randall E. Hicks. (2009) Changes in the Nitrification Rate during Late Summer and Fall in Lake Superior. 23rd National Conference of Undergraduate Research. La Crosse, WI.

PRESENTATIONS

Local:

Poster, **Cellular and Molecular Graduate Program Symposium**

Title: **Loss of mTOR Complex 1 signaling in pancreatic α -cells prevents fasting-induced hypoglycemia.**

University of Michigan: Ann Arbor, MI; August 2013

Poster, **6th Annual Midwest Islet Club**

Title: **Levels of mTOR Complex-1 Activation in Pancreatic Beta-cells Determine Responses to Diabetogenic Conditions.**

University of Michigan, Ann Arbor MI; May 2013

Thesis Seminar, **University of Minnesota Integrated Biosciences Graduate Program**

Title: Insulin-like Growth Factors and placental ischemia-induced hypertension in the pregnant rat

University of Minnesota Medical School-Duluth; May, 2011

Presentation, **Medical College of Wisconsin**, Department of Physiology

Title: **The role of IGF-1 in preeclampsia**

Milwaukee, Wisconsin; February 2011

Colloquia Speaker, **University of Minnesota Integrated Biosciences Graduate Program**

Title: **The role of the IGF system in the pathophysiology of preeclampsia**

University of Minnesota Duluth; October 2010

Poster, **7th Annual Women's Health Research Conference**, Powell Center for Women's Health

Title: **Infusion of Recombinant IGF-I Reduces Oxidative Stress and Attenuates Placental Ischemia-Induced Hypertension During Pregnancy in the Rat.**

University of Minnesota, Twin Cities; September 2010.

Poster, **2nd Annual University of MN Cardiovascular Retreat**, St. John's University
Title: **Effects of Placental Ischemia on the Insulin-like Growth Factor System During Late Gestation**
Collegetown, Minnesota; July 2010

Poster, **6th Annual Women's Health Research Conference**, Powell Center for Women's Health,
Title: **Effects of Placental Ischemia on the Insulin-like Growth Factor System During Late Gestation**
University of Minnesota, Twin Cities; September 2009.

Poster, **University of Minnesota Duluth UROP Showcase**
Title: **Changes in the Nitrification Rate during Late Summer and Fall in Lake Superior**
University of Minnesota Duluth; April 2009

Seminar, **University of Minnesota Duluth**, Department of Biology
Title: **Pre-Implantation Genetic Diagnosis**
University of Minnesota, Duluth; November 2008

National:

Poster, **2011 Experimental Biology**, American Physiological Society
Title: **The Effect of Insulin-like Growth Factor (IGF-I) Infusion on Placental Ischemia-Induced Hypertension and Fetal Loss During Pregnancy in the Rat**
Washington, DC; April 2011

Poster, **2010 Experimental Biology**, American Physiological Society
Title: **Effects of Placental Ischemia on the Insulin-like Growth Factor System During Late Gestation**
Anaheim, California; April 2010.

Poster, **23rd National Conference of Undergraduate Research**, University of Wisconsin-La Crosse
Title: **Changes in the Nitrification Rate during Late Summer and Fall in Lake Superior**
La Crosse, Wisconsin; April 2009

TEACHING EXPERIENCE

Graduate Teaching Assistant, University of Minnesota Duluth Department of Biology
Spring 2010

Course: **Developmental Biology Laboratory**

Course Instructor: Jennifer Liang

Work description: Instruct and assist students with lab exercises, grade laboratory reports, prepare assessments.

Graduate Teaching Assistant, University of Minnesota Duluth, Department of Biology
Fall 2009 and Fall 2010

Course: **Biology I**

Course Instructors: Colleen Belk and Shannon Stevenson

Work description: Instruct and assist students with lab exercises and discussions, grade laboratory reports, prepare weekly assessments.

Graduate Teaching Assistant, University of Minnesota Duluth, Department of Biology

Spring 2010

Course: **Genetics Laboratory**

Course Instructor: Jennifer Liang

Work description: Instruct and assist students with lab exercises, grade laboratory reports, prepare assessments.

Undergraduate Teaching Assistant, University of Minnesota Duluth, Department of Biology

Spring 2009

Course: **Biology II**

Course Instructor: Lyle Shannon

Work description: Instruct and assist students with lab exercises.

Undergraduate Teaching Assistant, University of Minnesota Duluth, Department of Biology

Fall 2007

Course: **Biology I**

Course Instructor: Colleen Belk

Work description: Instruct and assist students with lab exercises.

SERVICE

Abstract Judge, ABRCMS 2011- Annual Biomedical Research Conference for Minority Students, St. Louis, Missouri.

Biology Service Outreach, Laura McCarter Elementary School, Duluth, MN; April 2011

Description: Introduce developmental biology topics to elementary students.

Brain Awareness Week, University of Minnesota Medical School-Duluth; April 2011

Description: Introduce neurophysiology topics and basic concepts to elementary students.

Youth Services Volunteer, Arrowhead Juvenile Center, Duluth, MN, Spring 2009

Description: Worked with students dealing with substance abuse.

Admissions Office Tour Guide, University of Minnesota Duluth; Spring 2006-2008

Description: Lead groups of prospective students and their parents on extensive tours of the campus. Responsible for presenting every part of the campus and for providing accurate descriptions of University programs, facilities, and services.

Hospital Volunteer, St. Mary's Duluth Clinic Health Services, Duluth, MN, Fall 2007

Department: Surgical Services, PACU

Work Description: Assisted with stocking and sterile processing.

Youth Services Volunteer, Damiano Kids' Café, Fall 2006

Description: Helped with serving food and facilitated playing games with youth.

WORK EXPERIENCE

Resident Advisor, Fall 2008-Spring 2010

Department: Housing and Residence Life, University of Minnesota Duluth

Work Description: Served as facilitator, resource person, peer counselor, community developer, activity planner, policy enforcer, advisor, and role model for 54 residents per year.

Student Assistant, Fall 2005- Spring 2009

Department: Career Services, University of Minnesota Duluth

Work Description: Assisted students at the reception desk, made appointments, answered the phone, provided frontline service, made copies of office forms, and assisted with general office duties.

LANGUAGES

Fluent in Bulgarian and English. Have studied Spanish and Russian.

SUPPORT

Type: Fellowship

Title: CMB Distinguished Student Fellowship

Institution: Cellular and Molecular Biology Graduate Program, University of Michigan
2013, Awarded

Type: Fellowship

Title: NIH Cellular and Molecular Biology Training Grant T32-GM007315

Institution: Cellular and Molecular Biology Graduate Program, University of Michigan
2012, Awarded

Type: Fellowship

Title: Rackham Merit Fellowship

Institution: Rackham Graduate School; University of Michigan
2011, Awarded

Type: Graduate Student Assistantship

Institution: University of Minnesota Duluth (Department of Biology), University of Minnesota Medical School-Duluth

2009-2011, Awarded

Type: Undergraduate Research Assistantship

Title: Undergraduate Research Opportunities Program (UROP)

Institution: University of Minnesota Duluth (Department of Biology)

2008, Awarded