

WFIRM 2014 SUMMER SCHOLARS PROGRAM

RESEARCH DAY

CELEBRATING MULTIDISCIPLINARY RESEARCH EXPERIENCES FOR UNDERGRADUATE SCHOLARS IN CHALLENGING AREAS OF REGENERATIVE MEDICINE

Friday, August 8th, 2014

The Wake Forest Institute for Regenerative Medicine (WFIRM) is an international leader in translating scientific discovery into clinical therapies. Our mission is, “To improve patients’ lives by developing regenerative medicine therapies and support technologies”. A significant challenge in this promising field is developing the next generation of engineers, scientists, clinicians and entrepreneurs cognizant of the challenges and approaches needed to solve regenerative medicine problems and design functional replacement tissues and organs. Here at WFIRM, inherently tied to our mission is the training of next generation experts to whom we will look toward to continue to advance and deliver upon the promise of this field and make a lasting impact on health conditions ranging from heart disease, diabetes, injury and aging.

Congratulations WFIRM Summer Scholars 2014!

Today we invite you to join us in celebrating the graduation of 25 summer undergraduate scholars, who participated in our annual 10-week summer research program. June 2nd, 2014 marked the beginning of the WFIRM’s Annual, 10-week, Summer Scholar Program. Today’s Final Research Day with scientific poster symposium and poster presentation provides the opportunity for interns to present their summer undergraduate research. We offer our congratulations to both interns and their mentors for their important contributions and participation. Much success is extended to our interns in their future educational and career pursuits. WFIRM is privileged to be a part of your intellectual and professional growth. We thank you all for joining us and the support you have extended to these fine young adults.

Sincerely,

Anthony Atala, MD
Director

2014 WFIRM Summer Scholars

Summer Scholar	Mentor(s)
Ethan Bassin University of Pennsylvania Bioengineering, Junior	Anthony Atala, MD, Professor and Director of WFIRM, James Yoo, MD, PhD, Professor; and In Kap Ko, PhD, Instructor
Jared Beyersdorf University of Nebraska-Lincoln Biological Systems Engineering, Junior	John D. Jackson, PhD, Associate Professor and Sang Jin Lee, PhD, Assistant Professor
Morgan Burt Wake Forest University Biology, Junior	John D. Jackson, PhD, Associate Professor and Sang Jin Lee, PhD, Assistant Professor
Raymond Chang University of Maryland, Baltimore Biological Sciences, Junior	Colin Bishop, PhD, Professor
Joshua Copus Clemson University Biomedical Engineering, Sophomore	Aaron M. Mohs, PhD, Assistant Professor
Kyle Cowdrick University of Notre Dame Chemical and Biomolecular Engineering, Junior	Frank C. Marini, PhD, Professor
Joseph Denman Appalachian State University Chemistry, Biology minor, Sophomore	Aleksander Skardal, PhD, Assistant Professor
Abigail Hawkins Indiana University of Pennsylvania Biology, Pre-med, Sophomore	Graca Almeida-Porada, MD, PhD, Professor
Katherine Katsivalis University of Illinois at Chicago Neuroscience, Junior	Anthony Atala, MD, Professor and Director of WFIRM, and Hooman Sadri-Ardekani, PhD, Senior Research Fellow
William Anthony Lambert Boston College Biology, Sophomore	George J. Christ, PhD, Professor and Graca Almeida- Porada, MD, PhD, Professor
Julie Marco Wake Forest University Chemistry, Junior	James Yoo, MD, PhD, Professor
Jhonatan Nagasako Western New England University Biomedical Engineering, Junior	Benjamin S. Harrison, PhD, Associate Professor and George J. Christ, PhD, Professor

Summer Scholar	Mentor(s)
Madison Pace North Carolina State University Human Biology, Senior	John D. Jackson, PhD, Associate Professor and Sazzad Hassan, PhD, Instructor
Andrew Pak Davidson College Chemistry with Biochemistry concentration, Senior	George J. Christ, PhD, Professor
Harsh Patolia Wake Forest University Biophysics, Sophomore	Frank C. Marini, PhD, Professor and George J. Christ, PhD, Professor
Sandhya Rao Hamilton College Neuroscience, Junior	Frank C. Marini, PhD, Professor and George J. Christ, PhD, Professor
Olivia Reidell Arizona State University Biological Sciences, Junior	John D. Jackson, PhD, Associate Professor
Brian Shannon University of Notre Dame Biochemistry, Junior	Khalil N. Bitar, PhD, Professor
Shruti Singh University of Texas, Austin Immunity and Pathogenesis, Junior	John D. Jackson, PhD, Associate Professor
Aaron Smith University of California, Berkeley Microbial Biology, Junior	Shay Soker, PhD, Professor and In Kap Ko, PhD, Instructor
Sophia Szymkowiak Yale University Biomedical Engineering, Junior	James Yoo, MD, PhD, Professor and Sunyoung Joo, MD, Research Fellow
Marcus Valcarce-Aspegren UNC Chapel Hill Chemistry, Freshman	Steve Walker, PhD, Associate Professor
Alexandra Wells Rensselaer Polytechnic Institute Biomedical Engineering, Sophomore	Emmanuel Opara, PhD, Professor
Elizabeth Wicks University of Mississippi International Studies, French (Pre-Med), Sophomore	K. C. Balaji, MD, Professor
Kyung J. Yoo Wake Forest University Chemistry, Sophomore	Benjamin S. Harrison, PhD, Associate Professor

WFIRM-UCT Short-Term Exchange

Joining us today during the poster session, we also celebrate the participation of two MSc students from the University of Cape Town who engaged in a short-term, 6 weeks research exchange at WFIRM, between June 30th and August 8th, 2014.

WFIRM-UCT Summer Scholar	Mentor(s)
Cindy Chokoza University of Cape Town MSc (Med) Biomaterials	J. Kouidy Williams, DVM, Professor
Ellen Ngarande University of Cape Town MSc (Med) Biomaterials	Emmanuel Opara, PhD, Professor and Thomas Shupe, PhD, Instructor

WFIRM Summer Scholars Research Day 2014

Friday, August 8th, 2014

SCHEDULE

7:45 am to 8:15 am Summer Scholars Preparation and Photo Session
- Summer Scholars meet at WFIRM, Collaboration Area, Room 250

Note: Move to Piedmont Triad Research Center for
Welcome and Summer Scholars Presentations

8:00 am to 8:30 am Guest Arrivals: Registration w/coffee

8:30 am to 8:45 am Welcome and Overview

Anthony Atala, MD, Director, WFIRM and T. Shupe, PhD, Instructor and Summer Scholars Program Scientific Director

8:45 am to 10:00 am Summer Scholars' Presentations - Sessions 1 and 2

Session 1

Yu-Rei Chang	<i>DIFFERENTIATING INDUCED PLURIPOTENT STEM CELLS INTO HUMAN THREE-DIMENSIONAL CEREBRAL ORGANIDS</i>
Alexandra Wells	<i>PRESENCE OF BONE MARROW STEM CELLS INCREASES ESTROGEN PRODUCTION OF OVARIAN CELLS FOR CELL-BASED HORMONE REPLACEMENT THERAPY IN VITRO</i>
Jared Beyersdorf	<i>FABRICATION OF A BIOMASK USING THREE-DIMENSIONAL BIOPRINTING</i>
Madison Pace	<i>EFFECT OF WNT ACTIVATORS ON C-MYC ACTIVATION LEADING TO INNER EAR SUPPORTING CELL PROLIFERATION</i>
Kyung Jin (KJ) Yoo	<i>OXYGEN PRODUCING BIOMATERIALS FOR IMPROVING CELL VIABILITY UNDER HYPOXIA</i>
Marcus Valcarce-Aspegren	<i>INDUCED PLURIPOTENT STEM CELLS FROM CHILDREN WITH PHELAN-MCDERMID SYNDROME AS A MODEL FOR FUNCTION OF THE ENTERIC NERVOUS SYSTEM</i>
Elizabeth Wicks	<i>PRORAINBOW: A NOVEL IN VIVO PROSTATE MOUSE MODEL TO TRACK THE ORIGIN OF PROSTATE CANCER</i>

Session 2

Aaron Smith	<i>ROLE OF LAMININ SIGNALING IN BILE DUCT FORMATION</i>
Sandhya Rao	<i>HOW FAT IS YOUR TAF: THE CONSEQUENCES OF FEEDING FAT TO TUMORS THROUGH THE MICROENVIRONMENT</i>
Joseph Denman	<i>DEVELOPMENT OF A CARDIAC-SPECIFIC HYDROGEL FOR PHOTO-PATTERNING CARDIAC TISSUE CONSTRUCTS</i>
Katherine Katsivalis	<i>ELIMINATING MOLT-4 ACUTE LYMPHOBLASTIC LEUKEMIA CELLS FROM HUMAN TESTICULAR CELL CULTURES PRIOR TO SPERMATOGONIAL STEM CELL (SSC) AUTOTRANSPLANTATION TO RESTORE FERTILITY</i>
Julie Marco	<i>BIOFABRICATION OF FUNCTIONAL SKIN GRAFTS USING A 3D BIOPRINTER</i>
Olivia Reidell	<i>BIOFABRICATION OF A VASCULAR CONSTRUCT</i>

10:00 am to 10:15 am Coffee Break

10:15am to 10:25am Commitment to K-12/Teacher Externs at WFIRM

Joan Schanck, MPA, Academic Research Program Officer; Melanie White Stancill, Davie High School and Terry Howerton, Atkins Academic & Technology High School

10:25am to 11:45am Summer Scholars' Presentations – *Part II*

Session 3

Kyle Cowdrick	<i>WITH EYES TO SEE: OPTIMIZING TWO-PHOTON IMAGING AND COMPUTATIONAL ANALYSIS FOR 3D TOPOGRAPHICAL VISUALIZATION OF OPTICALLY CLEARED WHOLE NORMAL AND REGENERATIVE TISSUES</i>
Harsh Patolia	<i>BIOPHYSICAL QUANTIFICATION OF COLLAGEN FIBRILS IN MURINE BLADDER EXTRACELLULAR MATRIX</i>
Sophia Szymkowiak	<i>IN VITRO GENERATION OF HORMONE-RELEASING OVARIAN FOLLICULAR STRUCTURES</i>
Andrew Pak	<i>CHARACTERIZATION OF BLADDER REGENERATION IN MOUSE MODEL—THE ROLE OF MACROPHAGES</i>
Brian Shannon	<i>INTERSTITIAL CELLS OF CAJAL CONTRIBUTE TO NEUROMUSCULAR TRANSMISSION IN INNERVATED BIOENGINEERED SMOOTH MUSCLE</i>
Abigail Hawkins	<i>EVALUATION OF ENGRAFTMENT AND APOPTOSIS FOLLOWING TRANSPLANTATION OF MODIFIED HUMAN BONE MARROW MESENCHYMAL STROMAL CELLS IN A MURINE MODEL OF INFLAMMATORY BOWEL DISEASE</i>

Session 4

Morgan Burt	<i>3D-BIOPRINTING OF A MUSCULOTENDINOUS JUNCTION</i>
Joshua Copus	<i>PEGYLATION OF SELF-ASSEMBLED HYALURONIC ACID BASED NANOPARTICLES FOR IMAGE GUIDED SURGERY</i>
Ethan Bassin	<i>ENHANCED PRIMARY ENDOTHELIAL CELL ATTACHMENT VIA ANTIBODY CONJUGATION: TOWARD KIDNEY IMPLANTATION USING AUTOLOGOUS CELL SOURCES</i>
William Lambert	<i>MESENCHYMAL STEM CELLS TO PROMOTE NERVE REPAIR</i>
Shruti Singh	<i>REGENERATION OF THE THYMIC MICROENVIRONMENT BY IN VITRO CELL SEEDING OF A THYMUS SCAFFOLD</i>
Jhonatan Nagasako	<i>ELECTRIC FIELD WELL PLATE GENERATOR FOR CELL STIMULATION STUDIES</i>

11:45am to 12:00pm Wrap-Up/Certificates of Completion

12:00pm to 1:00pm Lunch at WFIRM, Richard Dean Building, 2nd Floor Collaboration Area, 391 Technology Way

1:00pm to 1:30pm Lab Tours for Parents and Guests

1:30pm to 3:00pm Poster Session