# Ryan J. Pewowaruk

pewowaruk@wisc.edu, 507-206-1327 (cell)
9 Craig Ave, Madison, WI 53705

First year Ph.D. student in biomedical engineering at UW-Madison, interested in research in computational biomechanics, biofluids and biotransport. My career goal is to direct a research group at either a national lab or industry setting.

## Education

2016 –          Ph.D          Biomedical Engineering, University of Wisconsin – Madison
- Advised by Prof. Naomi Chesler

2013 - 2016     B.BME         Biomedical Engineering, University of Minnesota – Twin Cities
- *Summa cum laude*
- Graduated in three years
- 3.82 GPA

## Relevant Experiences

2016 -          Graduate Research Assistant, Vascular Tissue Biomechanics (VTB) Lab, Dept. of Biomedical Engineering, University of Wisconsin - Madison
- Computational modeling of cardiac mechano-energetic coupling in the right ventricle

2016            Virtual Engineering Team (VET) Intern – Boston Scientific, Maple Grove, MN
- Biaxial tensile testing of bovine pericardium and hyper-elastic, anisotropic material model optimization
- FEA projects relating to the Lotus heart valve
- V&V 40 FEA model sensitivity analysis
- Software validation activities

2014 – 2016     Undergraduate Research Assistant, Victor Barocas Group, Dept. of Biomedical Engineering, University of Minnesota – Twin Cities
- Computational modeling of cell and ECM fiber network under mechanical load. Network stiffness was modulated via cell strain, fiber strain and fiber direction **(Paper Published 2016: *Interface Focus*)**
- Senior Honors Thesis: 3D strain tracking of CT and ultrasound images with finite element models to characterize the deformation of Abdominal Aortic Aneurysms when treated with a stent graft **(Abstract will be submitted to SB3C)**
- Characterization of Ascending Thoracic Aortic Aneurysm tissue using mechanical testing
- Image processing of glomeruli confocal microscopy stacks to retrieve pertinent information such as cell number, volume and capillary size
- Micropipette aspiration of porcine glomeruli

2015            Research and Development Intern, Boston Scientific Urology and Pelvic Health, Minnetonka, MN
- Design and validation of equipment and test method to measure the flow rate through a microfluidic resistor at a specified pressure. The resistor is a component of an artificial urinary sphincter.

2014            Membrane Biochemistry Intern, Rhoderick Brown Group, Hormel Institute, Austin, MN
- Gene transfection, cell culture, western blots and fluorescence experiments to show the role membrane receptor protein CPTP plays in regulating autophagy

# Ryan J. Pewowaruk

pewowaruk@wisc.edu, 507-206-1327 (cell)
9 Craig Ave, Madison, WI 53705

| | |
|---|---|
| 2013 – 2014 | Undergraduate Research Assistant, David D. Thomas Group, Dept. of Biomedical Engineering, University of Minnesota – Twin Cities |

- Study of heart failure from a biophysics perspective, utilizing EPR experiments to study how phospholamban inhibits SERCA, a calcium transporter necessary for muscle contraction.

## Publications

Gyoneva, L., Hovell, C.B., **Pewowaruk, R.J.**, Dorfman, K.D., Segal, Y., Barocas, V.H., "Cell-Matrix Interaction during Strain-Dependent Remodeling of Simulated Collagen Networks", *Interface Focus*, 2016

## Presentations

**Pewowaruk, R.J**., Faizer, R., Barocas, V.H., "CT-Based Estimation of Structural Interactions of the Vessel Wall and Stent Graft in Endovascular Repair of Abdominal Aortic Aneurysm", 2016 Summer Biomechanics, Bioengineering and Biotransport, National Harbor, MD, June 2016

"Choose Your Emphasis Area Panel", University of Minnesota BMES Chapter, University of Minnesota, Minneapolis, MN, February 2016

"How to Get Involved in Undergraduate Research Panel", University of Minnesota BMES Chapter, University of Minnesota, Minneapolis, MN, October 2015

## Awards and Honors

| | |
|---|---|
| 2015 - 2016 | College of Science and Engineering "Upper Division Merit Scholarship" |
| 2015 | Fall UROP Funding, "Multi-Scale Modeling of Stress and Fatigue in the Inner and Outer Curvature of Ascending Thoracic Aortic Aneurysms" |
| 2015 | Dean's List for College of Science and Engineering, Spring |
| 2015 | Spring UROP Funding, "Shear Forces in Ascending Thoracic Aortic Aneurysms" |
| 2013 – 2016 | University of Minnesota "President's Scholarship" |
| 2014 | Dean's List for College of Science and Engineering, Spring |
| 2013 | Dean's List for College of Science and Engineering, Fall |

## Computer Skills

*Advanced*

| MATLAB | SolidWorks | Abaqus | HyperWorks | Microsoft Office |
|---|---|---|---|---|

*Intermediate*

| COMSOL | LabView | Ansys | Arduino | Mimics |
|---|---|---|---|---|

*Beginner*

| Minitab | C++ | FEBio | R | MCalibration |
|---|---|---|---|---|