



**Exponent<sup>®</sup>**  
Engineering & Scientific Consulting

## Will Koshut, Ph.D.

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### Professional Profile

Dr. Koshut specializes in materials characterization and product development for biomedical devices and consumer products. His training in chemistry, materials science, mechanical engineering, and biomedical engineering has led him to support clients with challenges at the interfaces of these fields.

Additionally, Dr. Koshut is involved in the design and execution of research studies with human participants that develop new wearable technologies for health applications.

Prior to joining Exponent, Dr. Koshut obtained his Ph.D. from Duke University in the Department of Mechanical Engineering and Materials Science, where his research explored the fatigue behavior of soft tissue replacement candidates in pristine and flawed states to ultimately treat osteoarthritis (OA). For this work, Dr. Koshut created a basic experimental model to account for the impact of flaws on the fatigue behavior of the material, which has since been published in peer-reviewed journals. Dr. Koshut's specific research experience includes mechanical testing, polymeric material characterization, hydrogel synthesis and testing, animal tissue testing, and flaw sensitivity analysis. His multidisciplinary engineering background enables him to analyze failures of medical devices, aid in new product development of implantable medical devices, and characterize properties of biomedical materials using a variety of chemical and mechanical techniques.

### Academic Credentials & Professional Honors

Ph.D., Mechanical Engineering and Materials Science, Duke University, 2021

M.S., Mechanical Engineering and Materials Science, Duke University, 2019

B.S., Chemistry, Carnegie Mellon University, 2017

Member of Society of Duke Fellows 2017-2021

Duke Materials Research Society Member 2020-2021

Pratt-Gardner Fellowship Award 2017-2018

Snyder Scholarship Award 2016

### Licenses and Certifications

Good Clinical Practices (GCP) in Medical Device Clinical Investigations

## Prior Experience

Graduate Research Assistant, Department of Mechanical Engineering and Materials Science, Duke University, 2017 – 2021

Undergraduate Researcher, Sydlik Laboratory, Carnegie Mellon University, 2015-2017

Undergraduate Researcher, Jin Laboratory. Carnegie Mellon University, 2015

Application Development Intern, Covestro LLC., 2016

Polyether Process Research Intern, Bayer MaterialScience, 2015

## Patents

US20190119444A1: "Process to Remove DMC Catalysts from Polyether Carbonate Polyols", 2019. (S. Lewis, P. Uthe, W. Koshut)

## Publications

W. J. Koshut\*, N. Kwon\*, J. Zhao\*, A. Amendola, B. J. Wiley, K. Gall, "Flaw Sensitivity and Tensile Fatigue of a High-Strength Hydrogel", International Journal of Fatigue, 2022, 163, 107071.

\*indicates equal contribution.

W. J. Koshut, C. Rummel, D. Smoot, A. Kirillova, K. Gall, "Flaw Sensitivity and Tensile Fatigue of Poly(Vinyl Alcohol) Hydrogels", Macromolecular Materials and Engineering, 2021, 306, 2000679.

D.S. Ruppert, M.M. Mohammed, M.M. Ibrahim, E.O. Bachtiar, K. Erning, K. Ansari, J. Everitt, D. Brown, B. Klitzman, W. Koshut, K. Gall, H. Levinson. "Poly (lactide-co- $\epsilon$ -caprolactone) scaffold promotes equivalent tissue integration and supports skin grafts compared to a predicate collagen scaffold", Wound Repair Regen. 2021, DOI: 10.1111/wrr.12951.

Zhao, J., Kirillova, A., Kelly, C. N., Xu, H., Koshut, W. J., Yang, F., Gall, K., Wiley, B. J., "High-Strength Hydrogel Attachment through Nanofibrous Reinforcement", Adv. Healthcare Mater. 2020, 202001119.

Yang, F.\*, Zhao, J.\*, Koshut, W. J.\*, Watt, J., Riboh, J. C., Gall, K., Wiley, B. J., "A Synthetic Hydrogel Composite with the Mechanical Behavior and Durability of Cartilage", Adv. Funct. Mater. 2020, 2003451.

\*indicates equal contribution.

W. J. Koshut, D. Smoot, C. Rummel, A. Kirillova, K. Gall, "Tensile Fatigue of Poly(Vinyl Alcohol) Hydrogels with Bio-Friendly Toughening Agents", Macromolecular Materials and Engineering, 2020, 305, 1900784.

W. J. Koshut, A. M. Arnold, Z. C. Smith, Z. M. Wright, S. A. Sydlik, "Teaching Polymer Theory through the Living Polymerization and Characterization of Poly(methyl methacrylate) and Poly(butyl methacrylate) Homo- and Copolymers" J. Chem. Educ. 2019, 96, 895.

Good, J.; Duchesne, P. N.; Zhang, P.; Koshut, W.; Zhou, M.; Jin, R., "On the functional role of the cerium oxide support in the Au<sub>38</sub>(SR)<sub>24</sub>/CeO<sub>2</sub> catalyst for CO oxidation". Catal. Today, 2017, 280, Part 2, 239–245.

## Presentations

W. J. Koshut, D. Smoot, C. Rummel, A. Kirillova, K. Gall, "Tensile Fatigue of Poly(Vinyl Alcohol) Hydrogels with Bio-Friendly Toughening Agents". Poster presentation, Duke University, April 2019.

W. J. Koshut, A. M. Arnold, Z. C. Smith, Z. M. Wright, S. A. Sydlik, "Teaching Polymer Theory through the Living Polymerization and Characterization of Poly(methyl methacrylate) and Poly(butyl methacrylate) Homo- and Copolymers". Poster presentation, Carnegie Mellon University, February 2017.