



Exponent[®]
Engineering & Scientific Consulting

Andrew Dillon, Ph.D., P.E.

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Professional Profile

Dr. Dillon's expertise is in employing a multidisciplinary approach to the characterization and analysis of medical devices and their constituent materials. He is proficient in colloid characterization, crystal structure analysis, multiphysics finite element modeling, nanocrystal synthesis, electrochemistry, and morphological, optical, and electrical characterization techniques. He has also done work designing and operating microreactors for thin-film deposition, optimizing chemical synthesis yields, and developing techniques for nanocrystal surface modification. He routinely applies his extensive background in material characterization to evaluate bulk materials and coatings used in semiconductors and medical devices. He has leveraged his expertise in material analysis for the characterization of orthopedic wear debris, explanted medical devices, and synthetic bone filler using techniques like zeta-sizing, DLS, electron microscopy, FTIR spectroscopy, and X-ray diffraction.

Additionally, he has extensive experience in evaluation of the safety of passive medical devices in MRI environments. Using multiphysics computational modeling (via COMSOL, Matlab and Python), he has determined worst-case configurations of modular medical devices to optimize and focus MRI-compatibility tests. He has also designed, performed, and reviewed over 25 MRI-compatibility tests on medical devices ranging from large orthopedic product families to prototyped implantable computer chips.

Dr. Dillon obtained his Ph.D. in Chemical Engineering from Drexel University where he developed electrophoretic deposition of semiconducting nanocrystals for scalable and sustainable manufacturing of photovoltaics. This work spanned from the synthesis and preparation of colloidal nanocrystals to reactor design and electrophoretic deposition of semiconducting thin-films to optoelectronic and morphological characterization of the resulting deposits. In addition, he collaborated with the Material Science and Engineering department to explore solution-processing methods for fabricating transparent conductors with colloidal 2D Ti₃C₂.

Academic Credentials & Professional Honors

Ph.D., Chemical Engineering, Drexel University, 2018

B.Sc., Chemical Engineering, University of Maryland, Baltimore County, 2013

Drexel College of Engineering Carleone Award, 2015-2016

Koerner Family Award, 2014-2015

Undergraduate Research Award, 2012

Licenses and Certifications

Licensed Professional Chemical Engineer, California, #7001

Prior Experience

Graduate Research Fellow, Drexel University, 2013-2018

Undergraduate Researcher, University of Maryland Baltimore County, 2012-2013

Undergraduate Research Fellow, National Institute of Standards and Technology, 2009