

Exponent®
Engineering & Scientific Consulting

Bo Qing, Ph.D.

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Professional Profile

Dr. Qing specializes in failure analysis, design, and development of consumer products. He is trained and certified on Good Clinical Practice (GCP) for clinical investigations of devices.

Dr. Qing leverages his training and project management experience to help clients with the design and execution of human participant research studies that are aimed to develop new wearable technologies for health and fitness tracking. Dr. Qing's expertise also includes synthesis of composite-based polymeric materials with tunable properties and mechanical testing of both synthetic materials and biological tissues at multiple length- and time-scales of deformation. He has extensive experience with various mechanical characterization techniques including oscillatory shear rheology, instrumented indentation, atomic force microscopy (AFM), and impact testing.

Additionally, he has experience with animal disease models, mammalian cell cultures, and various in vitro biological assays. His multidisciplinary engineering background enables him to investigate failures of medical devices and aid in the material selection and design of new products.

Prior to joining Exponent, Dr. Qing obtained his Ph.D. from Massachusetts Institute of Technology in the Department of Biological Engineering. His doctoral research focused on developing synthetic surrogates for brain tissue that can be used as test media to evaluate new protective helmets and optimize robotic surgery techniques. During this work, he developed and validated new methods to measure the viscoelastic mechanical properties of brain tissue and of potential surrogate candidates. Dr. Qing also investigated the mechanisms of mechanical energy dissipation in soft, viscoelastic materials, specifically elucidating the role of surface adhesion.

Academic Credentials & Professional Honors

Ph.D., Biological Engineering, Massachusetts Institute of Technology (MIT), 2018

B.S., Bioengineering,Materials Science, Engineering, University of California, Berkeley, 2013

National Defense Science and Engineering Graduate Fellowship, 2014-2017

Robert A. Brown Graduate Fellowship, 2013

National Science Foundation REU Fellowship, 2012

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Languages

Mandarin Chinese

Publications

Qing B. Mechanical characterization of mammalian brain tissue and energy dissipative polymers. Ph.D. Dissertation, Massachusetts Institute of Technology, June 2018.

Qing B*, Canvoic EP*, Mijailovic AS*, Jagielska A, Whitfield MJ, Lowe AL, Kelly E, Turner D, Sahin M, Van Vliet KJ. Probing mechanical properties of brain in a tuberous sclerosis model of autism. Journal of Biomechanical Engineering 2018; In Press. *Co-first authors

Mijailovic AS*, Qing B*, Fortunato D, Van Vliet KJ. Characterizing viscoelastic mechanical properties of highly compliant polymers and biological tissues using impact indentation. Acta Biomaterialia 2018; 71:388-397. *Co-first authors

Qing B, Van Vliet KJ. Hierarchical design of synthetic gel composites optimized to mimic the impact energy dissipation response of brain tissue. Molecular Systems Design & Engineering 2016; 1:290-300.

Canovic EP, Qing B, Mijailovic AS, Jagielska A, Whitfield MJ, Kelly E, Turner D, Sahin M, Van Vliet KJ. Characterizing multiscale mechanical properties of brain tissue using atomic force microscopy, impact indentation, and rheometry. Journal of Visualized Experiments 2016; 115.

Liu P, Jin Z, Katsukis G, Drahushuk LW, Shimizu S, Shih C, Wetzel ED, Taggart-Scarff JK, Qing B, Van Vliet KJ, Li R, Wardle BL, Strano MS. Layered and scrolled nanocomposites with aligned semi-infinite graphene inclusions at the platelet limit. Science 2016; 353:364-367.

Presentations

Qing B, Cai L, Lienemann S, Weitz DA, Van Vliet KJ. Decoupling the roles of surface adhesion and bulk viscoelasticity on energy dissipation in compliant gels. Materials Research Society Fall Meeting, December 2016. Podium presentation.

Qing B, Van Vliet KJ. Characterizing the impact energy dissipation response of brain tissues and polymer gels via impact indentation. Society of Engineering Science 53rd Annual Technical Meeting, October 2016. Podium presentation.

Qing B, Van Vliet KJ. Optimization of bilayered gel composites to mimic the energy dissipation response of brain tissue. Materials Research Society Fall Meeting, December 2015. Poster presentation.

Qing B, Van Vliet KJ. Design and optimization of polymer gels to replicate impact energy dissipation of biological tissues. The Minerals, Metals & Materials Society 144th Annual Meeting, March 2015. Podium presentation.