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Professor Hugh Herr
Massachusetts Institute of Technology
Biomechatronics Group, MIT Media Lab
75 Amherst Street, Room E14-374L
Cambridge, MA 02139

Dear Dr. Herr:

I am inquiring about the possibility of joining your laboratory as a postdoctoral associate. Neural interfacing of implants has always fascinated me, and I have followed your work closely. I read your recent publications regarding neural control of prostheses (Clites+ *J Neural Eng* 2017 & Srinivasan+ *Sci Robot* 2017). I am particularly interested in interfacing implants with the nervous system, and I hope to translate my current work on interfacing mechanical disparities in biological systems to this field. My background in materials science will help bridge my expertise in mechanics and biology with electrical systems.

Currently, I am an NIH Fellow and Ph.D. candidate at Cornell University working on the *Characterization and Synthesis of Interfacial Tissue Systems* under Dr. Lara Estroff and Dr. Lawrence Bonassar. My graduate work has focused primarily on the soft tissue-to-bone interface of the meniscal enthesis, the interface of the soft, fibrocartilaginous tissue of the meniscus with the subchondral bone of the tibia. I have characterized the native meniscal enthesis using the imaging modalities of Raman microscopy and confocal fluorescent elastography to generate registered, microscale maps of the composition, structural configuration, and mechanics across this interface. These data have recently been submitted, and I am currently working on translating these techniques to analyze wound healing in cartilage through cellular injections in an equine model.

Utilizing information we gained from analysis of the meniscal enthesis, I am also developing a tissue engineered implant system for replacement of damaged menisci. This system combines local cell populations with stem cell populations to create a construct consisting of a collagen gel and partially demineralized bone for a tri-material scaffold. The resulting scaffolds are subjected to combination mechanical and chemical stimuli through a custom bioreactor during the culture period to enhance maturation. Data from these projects has led to a review on tissue engineering interfaces (Boys+ *MRS Comm* 2017). My work has resulted in three high profile talks at large, international conferences, as well as various other poster presentations.

I have experience in applying for fellowships and funding and have previously been awarded fellowships from both the NIH (NIH F31 Fellowship) and the NSF (NSF EAPSI Fellowship), the latter of which led to my working at a national lab in Beijing, China. I am planning on applying for fellowships for my postdoctoral work and am looking forward to discussing opportunities with you. I also have extensive experience mentoring students, having overseen work on variety of projects from two masters students and eight undergraduate students over the course of my Ph.D.

My research here is ongoing, but I expect to defend my thesis in December 2018. I look forward to discussing possibilities in your lab. If you have any further questions for me, please do not hesitate to call me at (610) 513-0517 or email me at ajb459@cornell.edu.

Thank you for your consideration,

A handwritten signature in black ink that reads "Alexander J. Boys". The signature is stylized and fluid.

Alexander Boys