

Q&A for Dr. Marc Petre welcome note and story

You are an engineer, but you work in a hospital. How did that happen?

I have a PhD in biomedical engineering but my children clarify for their friends, “my dad works in a hospital... but he’s not a *real* doctor...” My undergraduate degree is in Materials Science and Engineering and I attended a program where co-op/internship was mandatory. This gave me an opportunity as a student to work in industrial manufacturing, thin-film deposition, and finally for a manufacturer of orthopaedic implants. Learning more about how man-made materials and designs interact with the human body grabbed my interest and I went on to complete a master’s and doctorate in biomedical engineering. My dissertation work was completed in a lab at the Cleveland Clinic in Cleveland, Ohio which was my first experience participating in direct patient care. For the past 20 years I have been lucky enough to be part of an organization where brilliant engineers, doctors, nurses, finance, operations, and IT professionals work shoulder-to-shoulder to alleviate suffering.

What advice would you give to engineering students thinking about biology and medicine?

First of all, recognize that nature has solved many of the problems we investigate as engineers. Strong, low-density structured materials; efficient electrical conduction and insulation; parallel processing; self-assembly; chemical probes; - these are all things that exist in nature and it is worth looking at the natural world for inspiration. Specific to human biology and health, there are at least three areas where engineers contribute to healthcare:

1. Basic research to understand the mechanisms of human function and dysfunction
2. Design and manufacturing of consumables, instruments, and devices used in care
3. Support of incredibly complex infrastructure and facilities used to deliver care

There are so many opportunities to apply engineering to healthcare and there are few career sectors that are as meaningful and fulfilling. In addition, engineers are trained to approach problems in a unique way that tends to differ from medical professionals. It makes us great thinking partners for doctors, nurses, and other clinicians.

What role has innovation played in your career?

I really enjoy R&D work and the creation of new products. I can use a lathe and I know enough C# to be dangerous, but my day job is managing operations. I have been fortunate to keep my R&D interest alive by serving on advisory boards to a number of healthcare technology companies and by working with partners to commercialize ideas that we came up with in the hospital. Hospitals are great places to identify problems and prototype solutions, but we are not in the business of software development, manufacturing, and regulatory clearance. Commercial partnership allow us to bring ideas to life to impact more patients inside and outside of our health system. A lot of the projects I participate in are reaching the bedside in 3-18 months, which is very rewarding because you see the impact of your input on patients very quickly.