

Technology, Service and Bucking Convention: A Prescription for a Rewarding Biomaterials Career

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"The C. William Hall Award is very special to me because of the esteem which I hold for Bill Hall, MD, and it specifically recognizes Industry and Government workers. Bill, of course, was Founding President of the Society for Biomaterials and a pioneer in designing medical devices ranging from orthopedic to cardiovascular which were clinically functional at the time and evolved into the products in broad use today (1). Bill and I got to know each other at conferences during the late 1980s and early 1990s. The last time we spoke was after a talk I gave on preparing specimens for biocompatibility testing (2). I was clearly nervous during the talk, and he called me over afterwards and said "Nice talk." I indicated my nervousness, and he told me in his encouraging, mentoring way that that he didn't note nervousness, but that my slides were too "busy." His ironic, untimely passing in 1992 during open heart surgery announced at a meeting of his colleagues that I was attending sent shock waves through the audience, and, even now, he is enormously missed.

My entry into biomaterials in 1976 with Medtronic, Inc. as a synthetic polymer/organic chemist, after 10 years in the specialty chemicals industry, was unconventional as most polymeric biomaterials were off-the-shelf commodity products. I joined Medtronic the month that the new and very imposing FDA device law came into effect. This marked the end of the era of permissive technology development, in terms of regulations, but much opportunity to develop new biomaterials, processes and devices remained. My first task was to form the polymer group at Medtronic and increase the selection of biocompatible commercial polymers for long-term implants. We chose polymers that we hypothesized were biostable, and devoid of toxic extractables and submitted those for testing by FDA-approved protocols and, every composition that we submitted passed the protocol. Several were introduced as components of implantable medical products in novel configurations, some of which have persisted for over 30 years in tens of millions of devices. During my Medtronic tenure, we also set out to develop new polymers and succeeded in introducing the first synthetic, conductive

hydrogel skin electrode composition, a polyurethane still used to deliver steroid from pacemaker leads and new epoxy sealants, each with enduring value.

Moving on to my start-up company, Focal, Inc., in 1993, I was privileged to serve on the team that developed the first FDA-approved surgical sealant, a hydrogel for lung surgery. It was based on a platform technology which generated other products such as a matrix for demineralized bone delivery, a biopsy plug and an adhesion barrier component of a hernia mesh. The latter product was developed during my time at Genzyme Corporation (2000-2008), from which I "retired." At this stage it is crucial to mention that I would not have accomplished anything leading to products without the indispensable commitment, focus and hard work of colleagues and collaborators and support of family members too numerous to even list.

An important aspect of the prescription for my rewarding biomaterials career, which, again, has been somewhat unconventional for an industrial worker, is extensive volunteer professional service. This has been as gratifying as any technological accomplishments. Such service has included academic appointments and teaching positions, almost from the start of my career, entailing a gradual progression from technical school to small university to large university settings. Opportunities to serve on industrial, and other non-profit advisory boards while employed in industry also developed over time and some in each mentioned category carried over into my "retirement." Now I am also privileged to consult, mainly for start-ups.

Noted above is the prescription for my personal career in biomaterials. It is not a universal prescription, as it makes for a busy, complex life, and other commitments such as family intervene along the way. But, I appeal, particularly, to young industry members to consider this "hybrid" career strategy of technological pursuit and diverse professional service as most fulfilling.

(1)https://www.biomaterials.org/images/c_william_hall.jpg

(2)"Preparation of Specimens for Blood Compatibility Testing," A. Coury, Presentation to Cardiovascular Biomaterials, Devices and Biocompatibility Conf., sponsored by NIH, 02/22/1992, Chapter in: CV Path, Vol. 2, No. 3, (suppl.) pp 101S-110S, July-Sept., 1993.