
Surgeon-Scientist: Another Perspective

by Arthur L. Burnett

I responded to the invitation to have my say for the trainee page with eagerness—but also with some uneasiness. From the vantage point of an upward academician from a minority background, I could see how this short piece might offer a “how-to-succeed” message to trainees of similar black and ethnic minority groups with aspirations toward academic careers. I also could see how my story might be enlightening to others not considered disadvantaged or historically underrepresented. I do not consider my professional achievement to be in any way more extraordinary than that of many others, minority or otherwise. However, I do recognize in my own accomplishment the importance of some basic factors that are probably universal keys to success.

Retrospectively, I am keenly aware that educational environments and mentoring relationships are fundamental in one’s career advancement. My schooling had been straightforward—pre-baccalaureate schooling, a college-level experience, and graduate school-level training. Nonetheless, all of these opportunities have been formative. I view myself to have proceeded through a stepwise educational ascent, during which my intellectual growth was fostered through the practice of pursuing new ideas and making individual discoveries. My inclinations toward a scientific profession spawned from the challenges of science projects and the excitement of scientific progress. I was fortunate to attend Princeton University on an Army Reserve Officers Training Corps scholarship, during which time I pursued a major in biology. It was exciting to have my senior thesis work translated into a scientific journal publication, the first of this sort for me. I had studied hypothalamic sites responsible for regulating sociosexual behavior in female golden hamsters. The work probably predestined my scientific directions later on in sexual medicine.

During medical school at the Johns Hopkins University, I was exposed to the field of urology during my clinical clerkship rotations. I was attracted to urology as a surgical subspecialty after first considering general

surgery as a discipline. The surgical field seemed consistent with my personality, my aptitudes mentally and physically, and my sense that executing a craft could be a means to improve health. In addition, I interacted with a host of urologists such as Dr Patrick Walsh, former chairman of the Department of Urology, who was inspirational and showed by his own example in developing the nerve-sparing radical prostatectomy how critical thinking could lead to scientific discovery and how scientific contributions could improve clinical practice.

Continuing on in surgical and urological residency at Johns Hopkins, I gained greater scientific exposures in the basic science laboratories of the university. I was able to interact with Dr Donald Coffey, the former Director of Urological Research, whose enthusiasm for scientific discovery is unsurpassed. His enthusiastic support of my efforts to unravel the mechanisms of erectile function and erectile disorders has been a constant motivating force for my ongoing study of the field both then and for many years afterwards. I also interacted with Dr Tom Chang, a member of the urologic research staff at Johns Hopkins, specialist in male reproduction, and member of our society, who more than any of those things was a special friend and supporter of me when others were far less so encouraging.

In my early years of urological training, I was disturbed by the sparse treatments available for managing erectile dysfunction and then challenged by the mysteries of how penile erection even occurs. I began to explore the scientific basis for penile erection. I thought about the problem frequently, read up on all the scientific knowledge in the area to date, and identified scientific progress elsewhere that could be applied to the problem I was chasing. As a postdoctoral fellow, I sought out and developed a special relationship with Dr Solomon Snyder, Director of Neuroscience at Johns Hopkins. He introduced me to completely new ways of thinking about and solving scientific problems. Together, we described the importance of nitric oxide, just then characterized by his team to be an atypical neurotransmitter, as the elusive physiologic mediator of penile erection. This advance, along with related scientific contributions made by others working in this new area, provided the foundation for the development of oral erectile dysfunction drugs such as Viagra (sildenafil),

which operate through the nitric oxide signal transduction pathway.

Currently, I direct an active research laboratory in neurourology, which fulfills the other half of my professional title as a surgeon-scientist. A unique feature of this role is that I comfortably cross back and forth between these vocational existences, striving to make a difference that would not be possible for either one alone. I am fortunate to observe therapeutic successes and failures in the clinical arena and capably apply a basic science skill set to advance new directions in the scientific arena. We continue to pursue novel directions in my laboratory, which hopefully will have translational benefits. For instance, after recently describing the mechanism of priapism, a nontrivial clinical entity that can result in erectile tissue loss and erectile dysfunction in several patient groups, including many patients with sickle-cell disease, we have now begun exploring effective early approaches to treat the problem. As another example, in recognizing the realities of delayed and incomplete erection recovery in men following radical prostatectomy for prostate cancer, we are developing pharmacotherapeutic strategies to improve upon this functional outcome following the surgery.

Like other academicians, I also have carried out multiple roles, including participation on institutional committees, teaching responsibilities, professional society service, to name only a few. Performance of these assignments has been a calculated endeavor and reflects a commitment to the long process of academics, an enthusiastic seizure of opportunities for learning and advancement, and reinforcing self-demonstrations that measures of success are achieved with each successive activity. Indeed, personal traits of determination,

discipline, and perseverance have served me well in this often challenging process.

I would offer this thought for those who perceive for themselves any kind of barrier to academic success, whether it is socioeconomic, cultural, or whatever: barriers can be overcome by executing a carefully planned course of action involving education and training. The “why can’t I” attitude is entirely applicable and highly encouraged. No one should be excluded from making contributions if his/her heart is set on it. And each of us can be an example to others that progress can be made by anybody.

Many of my peers have frequently mentioned to me that I am a superb role model of the accomplished surgeon-scientist. Importantly, this accolade has not been prefixed by any term connoting race or cultural background. I cherish with great humility the thought that others would wish to emulate me based on character and accomplishment. I am particularly humbled since I do not believe my persona reflects any sort of complex or extraordinary formula. I realize that I have been a beneficiary of many blessings, both personally and professionally, and I have been fortunate enough to recognize and employ these to their fullest potential.

Of course, guidance and external support are always advantageous in the endeavor of academic achievement. Accordingly, I will take advantage of this space to champion the traineeship objectives and efforts of our own society, potentially gainful for all, including ethnic groups. My exercise herein is an example of this outreach, and it is hardly lost on me that by my matching in some readers an ethnic audience my story perhaps has served an additional level of inspiration.