

Chapter 2

What's in Store: The Brighter Side of Medical Research

Research in the biomedical field is full of a variety of pros and cons. In this section, I will provide an outline of what I view as the true joys of being in the world of biomedical research. In the following chapter, I will discuss some of its darker aspects.

It is useful to recall, however, that we are not static once we have reached adulthood. Our minds continue to change and our interests and needs also gradually evolve over time. In fact, studies have shown that an individual's perception of himself or herself in earlier years is often quite wrong—there is a simplistic general tendency to extrapolate backward from your current cognitive state to your past with the road to your current situation somehow seeming inevitable. In reality, the changes that happen to us, both from within and from without, alter us as we age. A woman beginning a research career at the age of 25 is likely to see and understand the world and her relationship to it in a very different way when she is 55. And one of the beautiful things about a career in research is the possibility of allowing for that change. You can slowly change your focus, interests, and ideas in sync with your own personal transformations.

Here is a short list that attempts to capture some of bright the lights that make biomedical research such a wonderful career choice:

1. **You can follow your passion and creativity.** Perhaps what drives most people into research is the possibility of being creative. One is not forced to follow a rulebook, but rather is placed in the position of actually creating the rules themselves. You have the opportunity to explore new concepts and build them from their very foundations. There are literally daily discoveries, and you can think again and again to yourself that you are the first person in the history of the world to do this or do that. There is always the possibility that you will discover some great new pathway or technology that will make everyone think in a new way. You have the opportunity to work on creating beautiful graphics or figures or developing novel and exciting ways to get your point across in print, the Internet, or during presentations at conferences. The opportunities for creativity are virtually endless, and they can

happen at any moment, whether it be a better way to collect data, a novel approach to analysis, or a startling new hypothesis.

2. Making a big difference in a big way—not just on a single-person basis. I think closely tied to the creativity piece is the idea that your ideas may end up changing the world in some big way. While it is true that most research does not create a dramatic paradigm shift in our understanding of the universe or basic physiology, it does contribute in some small way to the building of a greater structure. As Newton said (admittedly rather disingenuously), regarding his invention of the calculus, he was only able to do so by standing on the shoulders of giants. Or another way of thinking about it is that every little bit we uncover adds to the greater societal good. Perhaps your own discoveries will not change the world, but they may lead to other discoveries that eventually lead to others that do. I don't view research as being a footnote to a footnote. That idea is depressing. It should be envisioned, rather, as each of us contributing critical building blocks to a great structure.

3. Always new challenges and ideas. Nothing is ever the same in research. If it is, you are not doing research anymore. You will constantly be introduced to new ideas. You will find yourself needing to learn about new areas of science, new statistical methodologies, new technologies, or new models that will change the way you do things every day. You are forever a student when doing research and this is perhaps one of the greatest joys. It makes one feel eternally young to be learning about fresh ideas or, sometimes, rediscovering old ideas with a new potential application. To always feel like you are on the forefront of discovery and knowledge is an exciting place to be—the event horizon of modern-day medical science.

4. An opportunity to become a public figure and obtain broader recognition for one's work. In high school and college, the thought of getting up on a stage and speaking filled me with great trepidation. That was also true during the early years of my academic career. But slowly, with repeated opportunities to give talks and with increasing confidence in what I was actually speaking about, all that fear began to fade, and I now truly enjoy all opportunities to present my work publically. I like trying to tell a good story and seek to maintain the talk on a high level of complexity while not forcing the audience into a deep sleep. The opportunity to stand up and be known for one's work is truly an honor and privilege and very rewarding in itself. Occasionally, your work may even be recognized by an award—perhaps a society will give you an honorary membership (preferably before you die) or you will win a monetary or other award of recognition for what you have accomplished. Such success usually comes after much toil and with some luck—even though your moment in the spotlight is short lived.

5. Financial rewards sometimes including possible commercialization. While most people don't go into academic research focused on becoming wealthy, there is no question that occasional people do strike on to some new drug or technology that has the prospect of transforming the world. This could mean filing patents and creating a start-up company with goal of commercializing your efforts. It is sometimes only through commercialization of an aspect of one's work that a new technology or idea can be fully deployed. These commercialization efforts may bring about large financial rewards. However, such work also entails the challenges of dealing

with often-complex conflicts of interest that may interfere with one's own ability to perform research on the same subject matter. Plus it also almost always means acquiring an entirely new skill set in the field of business. More on this later. But for the moment, the most important thing to remember is that one of the joys about research is that it sometimes takes you into directions that may prove unexpectedly financially profitable.

6. Work hour/location flexibility. When I see patients in neurology clinic, I am restricted to specific hours on specific days on a specific floor to a specific room. If I start to run late, my day will turn into a huge mess. Not only do the patients become irritated and annoyed, but the support staff will undoubtedly want to throttle me since they are the ones on the firing line and dealing with the angry patients and their families. And God forbid if my clinic room is booked by another physician immediately after I am scheduled to finish my set of patients, and I am running late. I will have their wrath upon me. My patient-care life is rigidly fixed.

Medical research is virtually the diametric opposite. I can work virtually anywhere, at any time. In truth, one of the great joys I personally find about research is the tremendous flexibility it provides in terms of the flexibility of work location and time. But that wasn't always the case. When I had first entered the field in the early 1990s, the Internet was still in its infancy. If I needed to research a paper, I'd have to go to the library and start hunting for it down deep in the stacks. If I needed to review data, I would have to sit down with my research assistant in front of *their* computer. Today, though, I can work on papers at 2 AM at home or at 3 PM in the afternoon across the world. If I am away, I can Skype with my lab to make sure everything is moving along according to plan. My research assistants and postdocs can choose to work from 10–6 or 8–3 (they usually choose the former for some odd reason). About the only limitation we have is that if we are doing clinical research, we do need to try to stick to some kind of normal schedule, perhaps obtaining data on patients during regular office hours. But that freedom to pursue your work wherever and whenever you choose is truly liberating. It also means that you can be with your family and share childcare responsibilities more readily. That flexibility can go a long way to make for a good and happy home life.

7. Make friends across the country and around the world—with endless opportunities to travel. One of the other major pleasures of research is making new friends. It is a true pleasure to meet and interact with interesting and intelligent people from all over with a similar set of interests as your own. Even if your meetings may be only at semiannual conferences or via conference calls, there is real joy in getting to know many different often like-minded people. After all, you have all somehow found yourselves in the same area of science, so there might be a hidden commonality that binds you all together. I look forward to conferences to chat with friends and make new ones. And with that, of course, goes an opportunity to travel. Seeing all the major US and European cities is almost a certainty today for any active researcher, and increasingly we are also drawn to Asia and South America; I'm sure Africa and the Middle East will soon follow as well.

8. An opportunity to train and teach others/working as a team. In some respects I think this final aspect of research is perhaps the most exciting. One of my

previous fellows, who had once been a professional gymnast, described research as a “team sport.” And I think that is exactly right. We all work together and try to make something greater than the sum of our parts. No one of us is a winner—we all participate together—for the greater good of the overall project. I try to encourage my group to work together and help each other whenever possible, and I constantly strive to hire real team players. In contrast, when we see patients we are often alone in the process. And it is true there are many lonely hours as a researcher—whether it is writing grants late at night or performing a tedious multi-hour experiment. But even in those situations, there may be late-night phone conversations with research staff or postdocs or early morning telephone calls to finalize a project. The paper that gets submitted, the grant that gets funded, and the presentation to a large crowd are all the results of a group effort, and the more a principal investigator can get her team to realize it was all their doing, the better. The camaraderie, the mentoring, the group beer nights, the popcorn-filled group meetings—they are all proof that it really is a team effort. And in many respects that is the best part of the whole research adventure.



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Rutkove, S.B.

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