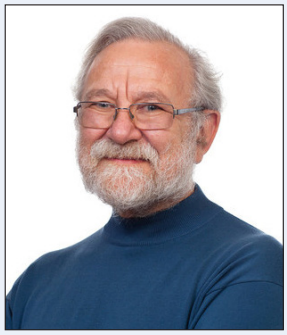
PRESIDENT'S Column

On Careers and 42

by Peter Walter

"What is the secret to a successful career in science?" is a question that I often encounter when meeting with students and postdocs at various institutions. It is a loaded question to which there is no tangible answer, and I always enjoy the discussion that follows. Each time the discussion takes off in a different direction, determined by the individuals sitting around the table, their life experiences and struggles, and the environment in which their work and training is embedded. Each time, the discussion causes me to reflect on my own career path, making me struggle to find an answer—some pieces of wisdom that could have more than just anecdotal value reflecting on my particular career path. This struggle to come up with a crisp answer reminded me of the supercomputer "Deep Thought" in Douglas Adam's *Hitchhiker's Guide to the Galaxy*.[1] Asked to compute the answer to the "Ultimate Question of Life, the Universe, and Everything," the machine calculated for an exorbitant length of time (7.5 million years to be exact) and then "with infinite majesty and calm" provided the answer: "42."



Peter Walter

Meant as a humorous counterpoint to millennia of philosophical and religious contemplations, there is, to my knowledge, no deep or symbolic significance to Deep Thought's answer. Yet it reflects beautifully on the futility of trying to distill simple and all-encompassing guidelines from issues of vast complexity. I wrote in a previous President's Column on the fallacies of allowing overgeneralizations to intrude in current discussions on reproducibility.[2]

Success can come in many different flavors, and for our graduate students and postdocs there are many examples of successful careers that diverge from the academic research path considered to be the only successful career some 50 years ago. The mere attempt to define a recipe for success, therefore, is as foolish as to answer the ultimate question of life, the universe, and everything. But on a much, much smaller scale, I can point to a few ingredients that had a strong impact on my becoming the scientist I am today. I picked a few of those that go beyond the obvious (i.e., work hard and meticulously; stay objective and honest; don't cheat; don't get caught eating in the lab; etc.).

So here you go, in no particular order:

1. See yourself as an explorer. As such, you need to take risks to try new things and be prepared for failure. Exploring a white spot on the map is incredibly rewarding, and white spots on the map are easy to find: Each time I leaf through Don Fawcett's book *The Cell* and go over the fascinating collection of classical high-quality electron micrographs of numerous cell types, I am struck by the vast expanse of unexplained biology. Each one of the projects on which I and my colleagues embarked led us into depths where current knowledge stops. This is the place to be, a place to be excited rather than scared.

Exploring a white spot on the map is incredibly rewarding, and white spots on the map are easy to find….

2. Embrace the paradox. When an experiment does not yield an expected result, it often is far more exciting than finding the expected, especially if there is no clear explanation. Many important discoveries, sometimes disparagingly portrayed as the result of "dumb luck," actually derive from the follow-up of paradoxical observations. The word *serendipity*, coined by Horace Walpole in 1754 based on the fairytale "The Three Princes of Serendip" to describe the act of "making discoveries by accident and

The American Society for Cell Biology

8120 Woodmont Avenue, Suite 750
Bethesda, MD 20814-2762, USA
Tel: 301-347-9300
Fax: 301-347-9310
ascbinfo@ascb.org, www.ascb.org

Erika C. Shugart
Executive Director

The *ASCB Newsletter* is published eight times per year by The American Society for Cell Biology.

W. Mark Leader — *Editor*
Thea Clarke — *Director, Communications and Education*
Leeann Kirchner — *Production Coordinator*
John Fleischman — *Senior Science Writer*
Christina Szalinski — *Science Writer*
Lynn Marquis — *Director, Coalition for the Life Sciences*

Advertising

For advertising information, visit www.ascb.org or contact sales@ascb.org

ASCB Newsletter
ISSN 1060-8982
Volume 39, Number 4
June 2016

Postmaster: Send change of address to:
ASCB Newsletter
The American Society for Cell Biology
8120 Woodmont Avenue, Suite 750
Bethesda, MD 20814-2762, USA

In my experience, the overall benefit of paranoia-free communication far outweighs the potential danger of giving away too much.

sagacity of things not in quest of,"[3] describes the element of chance in scientific progress much better than dumb luck. I previously wrote about our own encounters with serendipity on the meandering path to deciphering the mechanism of the unfolded protein response.[4]

3. Communicate with others. There is great value in discussing your out-of-the-box ideas or latest results with others. Many great new ideas and unforeseen connections in our own research resulted from an open dialogue, often at meetings over a beer or two. In my experience, the overall benefit of paranoia-free communication far outweighs the potential danger of giving away too much. Almost everyone appreciates being asked for input and suggestions.

Whenever we communicate our work, the potential significance of it should take center stage.

4. Ask significant questions. Our daily life in the lab often centers on minutiae: determining a rate constant for your favorite enzyme or figuring out whether histidine 148 is really that important. We need to remind ourselves constantly of the larger question that prompted us to make these inquiries and how small answers will synergize as pieces of the larger puzzle. Whenever we communicate our work, the potential significance of it should take center stage. As Sydney Brenner said, "Think small, talk big."

5. Don't expect linearity. We write grants and research proposals as if we know where a project will lead us. It is important to look forward in this way, but this approach maps out only *one* obvious road where a project may go. As a project progresses, more often than not, opportunities for new (perhaps totally unexpected) findings will open up. Sometimes they might require you to learn a new expertise or enter a new field. My advice: Don't let these opportunities slip away, but balance abandon with caution.

6. Balance your personal life and work. Research is hard and tedious and often frustrating—more so than we tell our incoming graduate students. It is important to have interests in (and draw satisfaction from) extracurricular activities. As a graduate student living in a little box in New York, I enjoyed photography. Now that I have a little more space and the kids are grown up, I try my hand at wood- and metal-working. I find that these activities stimulate my creativity and, even though they occupy some time, they feed back positively into my science. Likewise, the values of family and friends cannot be overestimated.

7. Show your enthusiasm. My daughter graduated with a major in psychology and theater from Lewis and Clarke College in Portland. She attended one of my lectures and, not being particularly interested in cellular proteostasis, afterwards critiqued my talk in terms of stage presence, liveliness, body movements, and pause-for-emphasis. For her, the lecture was a theatrical performance with more elements than just its intrinsic need to get information across. And she is right; how can we expect to motivate our students, colleagues, and the public unless we project enthusiasm and engagement? After all, our work *is* an adventure.

8. Appreciate your colleagues. Science is an intrinsically human enterprise. Our lab community is embedded in a university community, but also in the communities of our research fields. We interact at various levels, and over our career lifetimes we build and rely on interpersonal relationships. We are known and judged as much by our behaviors and personalities as we are by our scientific contributions. This point is sometimes forgotten, and it will become more important as review processes strive for more transparency. In my view there is no conflict between being critical and objective and still being nice and appreciative of the needs and feelings of others.

9. Teach and mentor. I am fortunate to have had the most amazing mentors at every stage of my career. I also find that passing on to our students, postdocs, and young faculty the tangible and, perhaps even more importantly, the intangible tools of the trade is one of the most rewarding experiences in my daily work.

When we address the beneficial role of graduate education in non-research careers, for example, we recognize that what we teach our students is the art of problem solving. Scientists are renowned for their analytical skills: They can naturally step back from a problem, objectively isolate the variables that affect the outcome, and suggest and implement solutions. Thus the skill set we teach extends far beyond the ability to pipet colorless liquids accurately—it enables our graduates to tackle many important challenges to benefit society.

10. Have high standards. It is obvious and of utmost importance that our work is solid and reproducible. But I also find pleasure in writing manuscripts that can be easily read and displaying data on slides and in figures in aesthetically pleasing ways. This takes time and effort, and I often draw strong criticism from the lab members when I complain about font sizes or varying line widths in their manuscript illustrations. But, "What is written without effort is in general read without pleasure,"[5] and I find that my occasionally obsessive–compulsive behavior has served us well.

To be truly comprehensive and cover the entire gamut of career advice, this list of points to ponder would clearly need to be extended. Coming from a single voice, however, it undoubtedly would become increasingly one-sided. In this spirit, we would like to hear from you. Perhaps with Labby's help to adjudicate, we will publish the most impactful of your insights in future *Newsletters*—until we have said everything there is to say and the all-encompassing list of our 42 entries is complete. ■

References and Footnotes

[1]Wikipedia on *The Hitchhiker's Guide to the Galaxy:* http://bit.ly/1TEAbkH.

[2]Walter P (2016). On reproducibility and clocks. *ASCB Newsletter* 39(2), 3–6. www.ascb.org/on-reproducibility-and-clocks.

[3]Oxford Dictionary definition of *serendipity*: http://bit.ly/1MwjCY7.

[4]Walter P (2010). Walking along the serendipitous path of discovery. *Mol Biol Cell* 21,15–17.

[5]Quote attributed to Samuel Johnson (1709–1764).

Questions and comments are welcome and should be sent to president@ascb.org.

We are known and judged as much by our behaviors and personalities as we are by our scientific contributions.