

Babies in Biomedical Research

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Babies in Biomedical Research

A few months ago, I had the pleasure of attending the traditional closing dinner of the 119th semiannual meeting of The Salt and Water Club*—held for the first time in Pittsburgh, and attended for the first time by a Club member from Cleveland (although elected while in New Haven). The dinner conversation—at first rather wide ranging—became focused when Mark Knepper of the NIH raised the casual (although probably not accidental) question as to why, as a member of a search committee, he was seeing so few applications from women. After all, in the US, women and men have been for several years near parity in biomedical PhD programs. Fresh from having written my previous editorial on “Sustainability in Biomedical Research” (1), I piped in that the NIH funding system is “brutal” and dissuades from principal-investigatorhood all but the most determined potential candidates, including women who happen to be—or who are interested in becoming—mothers. Nuria Pastor-Soler opined that, from her perspective as a principal investigator (PI)-mother, an equally negative factor was the paucity of quality day-care facilities on our campuses. As the conversation gained steam, I realized that the seeds of my next editorial were sprouting...I extracted my trusty pen from my shirt pocket, grabbed a menu, and started taking notes. I am writing this Editorial from the perspective of a dinner conversation, so I will not attempt to justify each statement with statistics or advance polling methodology. Rather, I will summarize the impressions that I gleaned from my fellow diners who seemed genuinely concerned by the aforementioned gender imbalance here in the US. Not all of the issues that I discuss will be germane for those in other countries, but I imagine that many of the issues that we face are not unique to the US.

*This is *the* Salt and Water Club, founded by physiologists and physician scientists—working in Boston, New Haven, New York, Philadelphia, Baltimore, and Washington, D.C.—interested in salt and water transport. This Club was followed by others such as the Southern Salt and Water Club and the West Coast Salt and Water Club.

The Issue

All those around the table agreed that, not only do we have too few senior women as PIs, but also too few younger women applying for their first positions as independent investigators. Somewhere between the time that they begin working toward their PhD degrees and the time that we on search committees expect to see them as applicants for that first independent position...something happens: a large fraction of the cohort of female biomedical researchers opts out.

Some Causes

The sense of the diners was that the aforementioned opting out is not a matter of men vs. women but of mothers (or prospective mothers) vs. the others. My previous editorial identified two important issues that could contribute to the opting out.

First, market forces have pushed back the average age for obtaining one's first R01 grant (which supports independent research) to the early 40s. As pointed out at dinner, we cannot expect women to delay their first pregnancy until after their first R01 grants are in hand; that would be playing Russian roulette with one's biological clock. Graduate students and post-doctoral fellows have figured this out and often start families before obtaining their first independent jobs. Thus they are taking care of babies while still in training, while battling inconvenient day-care options, perhaps while dealing with inconvenient parking arrangements (because of lack of seniority), and with limited financial resources. These factors by themselves may reduce apparent productivity and thereby make it less likely that the mother (or father) will be seen as being competitive for an independent position.

Second, investigators-in-training observe first hand the difficult time that their mentors—who appear to be smart and hard working—have in obtaining funding...the “brutal” system mentioned above. After assessing the risk-to-reward ratio, trainees—both men and women—may opt out.

Other causes doubtlessly contribute to the shortfall of women among applicants for PI positions. Among these reasons, some trainees—and presumably women more commonly than men—will simply choose to be stay-at-home parents...or at least be willing to trade the possibility of a PI career for the certainty of a more flexible life style. And, at least according to the popular press, the willingness to make this tradeoff is greater among those in today's trainee generation than in yesterday's.

Some Consequences

Because of opting out, biomedical sciences in general, and physiology in particular, are losing superb young experimental scientists—many of whom are men but many more of whom are women, especially mothers or prospective mothers. It is in society's best interest, I think, to populate its PI positions with the best and the brightest. To the extent that we dissipate our resources because of opting out, society has failed...and will pay a price.

Present practices can also dissipate potential resources far into the future: the babies not born to PI-mothers. I do not wish to get into discussions of nature vs. nurture vs. epigenetics, but we all know of examples of professional athletes who have produced children that follow in their parents' footsteps. Nobel Prizes sometimes also breed true. To the extent that society dissuades PI-mothers from raising children, it may reduce its chances of producing future stars in science or other endeavors.

The shortfall in women PI applicants—to the extent that it reflects dreams and careers unfulfilled—could be viewed as a feminist issue. Or a women's issue. It could also be viewed as an issue for men...because PI-mothers or potential PI-mothers have fathers, and may have brothers, husbands, or significant-others, and sons. The success of a PI-mother could be good for the family in terms of intellectual enrichment and financial stability...so we are also discussing a family issue. The small number of women PIs is certainly a university issue. Finally, the high prevalence of opting out by women is a societal issue for all the reasons listed in

this paragraph, and because of discoveries lost or delayed.

Some Solutions

To some extent, we lose potential PI-mothers for the same reasons that we lose potential PIs in general. Of course, the career of a PI has major attractions: It is exciting, it is one of the few professional careers in which your job is your hobby, and you are your own boss. On the other hand, this career also is intrinsically competitive, requiring a time commitment that is well beyond the traditional 40-hour work week. It is like being in training to be an Olympic-caliber athlete . . . and keeping up the pace for life. There is no “part time” for any extended period. As my colleague Witold Surewicz put it, “You’re either in or you’re out.” A corollary is that it is a major challenge to have more than one PI in a household. With these negatives in mind, what can we do to make our profession more inviting, especially for the PI-mother?

A partial solution would be to follow earlier suggestions for “Sustainability in Biomedical Research,” suggestions designed not only to make the system more efficient but also to make it less onerous. However, we could take additional steps particularly designed to attract and support potential PI-mothers. I understand that this is an issue that lacks universal agreement even among women. I know a few senior women who believe that the next generation of women ought to endure what they endured...no special considerations. I also know younger women who want to compete with their male counterparts on equal professional (as opposed to professional + parenting) terms. I respect the opinion holders but disagree with the opinion. Being a PI-father is a challenge. Being a PI-mother is far more of a challenge. We must be practical if we wish to reduce the prevalence of women opting out.

In the realm of NIH funding, we could extend the deadlines (e.g., based on years since the PhD) for eligibility for K-type awards (which support the transition to independence) by, say, 2 years for each newborn. The cost would be nil. For R01 grants, extend the length of the award by, say, 2 years for each newborn. I do not mean a no-cost extension, which forces the PI to shut down the laboratory and lose hard-fought institutional knowledge. I mean a prorated extension (e.g., rather than 5 years at \$250k/year, 7 years at \$250k/year for 1 newborn). The cost of this initiative would be a tiny fraction of the NIH budget.

In a profession where every minute counts, especially for parents, day care and schooling are critical issues. My previous institution offered convenient day care on campus. However, the number of slots was so small that, to place your child into the program, you had to queue up years before planning conception. As a young chair, I brought this issue up to my Dean (for whom I have a great deal of respect), who asked me whether I would rather expand the day-care center or keep my start-up package for hiring new faculty. I chose the latter...but it was an unfair answer to my question. At some point, each institution simply must invest in close-in day-care facilities—with a high level of care, extended hours, reasonable rates, and some means for taking care of a child with a fever or mild short-term illness. In Cleveland, we have access to an outstanding privately owned day-care facility that is convenient to the University and a renowned Clinic. I can walk out of my office and be in the day-care center in 10 minutes, thanks to convenient parking (see below). The University and Clinic each guarantee a certain child census to this Center, which in turn gives a discount to parents from these institutions. One thing is still missing: a mechanism for taking care of a child

who develops a fever during the day or develops a minor illness.

Both for children in day care and especially for older ones in school (which is rarely on campus), it would be advantageous to be able to hire an assistant. In the US, the federal government permits a “flexible benefits” program that allows parents to pay child-care expenses (e.g., day care, a nanny) with pre-tax dollars. In the early 1980s, the maximal amount allowable was \$5,000/year...it is still \$5,000/year.

In the realm of the tenure decision, the deadline could similarly be extended (e.g., 2 years per newborn). Many universities offer optional extensions. I am not advocating a delay of tenure, merely an extension of the deadline.

For parents not fortunate enough to have public-transportation stops both in front of their home and lab, close-in parking is a must. The only reason that I can reach my 2-year-old on 10 minutes’ notice is that I can be in my car on 3 minutes’ notice because of my seniority. The need for close-in parking is even more critical for trainees and junior faculty who are parents, and especially mothers.

I have not addressed some important questions. For example, should we include adoptions? (I think so.) Should fathers be eligible for maternal benefits? (Seems like an oxymoron.) Will those without children resent the advantages offered to those with children? (I think not.) Finally, I acknowledge that it will be impossible to level the playing field entirely. But I think it is high time that we in the US biomedical community started knocking the tops off a few mountains. ■

Reference

1. Boron WF. Sustainability in biomedical research. *Physiology* 25: 200–202, 2010.