



Susan Lindquist

(1949–2016)

Tricia R Serio

Susan Lindquist passed away on 27 October 2016, far too early for those who marveled at her brilliance through her many contributions to science, for all who knew her directly, and especially for her former trainees.

As has been written in countless obituaries since her passing, Lindquist was a pioneer in understanding the ways in which organisms respond to stress, a phenomenon known as the heat-shock response. Seeing past conventional wisdom, she championed the use of a wide array of model organisms such as yeast, fruit flies and plants to understand the biochemical, molecular and cell biological basis of protein folding and how errors in these processes lead to human disease. But for those of us who had the privilege of studying with her directly, Sue was a mentor, who has had an outsized, unparalleled and continuous impact on our careers. With Sue's passing, science has lost an amazing and influential mentor. In this obituary, I hope to convey exactly what her mentorship meant to those of us who benefitted directly from it (115 former postdoctoral and predoctoral trainees).

Without exception, those who knew her best describe her as brilliant, creative, curious and fearless; but above all, Sue was passionate about her pursuit of new understanding. She once wrote, "We don't need a gentler profession, but we do need a kinder and more generous one." In service of this view, Sue demanded our very best but gave us every resource to meet her expectations, including—and perhaps most importantly—her keen insight and sage advice. While many have described the pressure of working with such an accomplished and impressive scientist, who held the very highest standards for thinking about and solving the seemingly most intractable scientific problems, not one of us can say that our experiences with her were not completely transformational for the ways in which we approach science.

In reading through the anecdotes that her former trainees shared with me, it is clear that Sue had an uncanny knack for recognizing and providing what each of us

needed to achieve our potential. In some cases, it was unwavering support, while in others, it was a push to expand past the boundaries that we had set for ourselves. But beyond these individual interactions, four common themes, which reflect the core of Sue's philosophy about science, emerged. With the sad prospect that she will never mentor another scientist, I share these ideas on behalf of her former trainees not only in honor of her, but also as a remembrance of the gifts that she gave to each of us.

The first lesson was, "Be passionate about what you are doing." Sue's unrelenting passion to understand trumped the obstacle that all good scientists face—self-doubt—and compelled her to find new paths forward. She implored us to not "miss out on new phenomena that are hiding in plain sight" and taught us to trust our instincts and stand our ground. She encouraged us to take risks and to pursue "crazy" ideas. As a result, she achieved amazing breakthroughs that linked protein folding to such complex events as evolution, memory, inheritance and cancer.

The second lesson was, "Clear communication is as important as the science." Beyond her immense talent as a scientist, Sue was a gifted communicator of science, and held this aspect of her work as a top priority. She instilled in us the ideas that "making the discovery is only half the battle" and that we had a responsibility to clearly convey the experimental basis of our interpretations and their importance in all manuscripts. She taught this lesson through direct observation of her extended (and often epic) editing process, but it stuck. I often read the papers of her former trainees who have moved on to accomplished independent careers, and smile at her lasting influence in the phrases that are used and the logical way in which arguments are constructed.

The third lesson was, "Let the questions rather than your experience drive how you

approach science." Sue was interested in asking and answering big questions, and to do so she was completely confident in moving beyond her own expertise. She enthusiastically sought out collaborations and assembled teams of scientists with different perspectives, from physicists to clinicians, to follow her passion. One former trainee noted, "Sue instinctively understood the power of an all-hands-on-deck, cross-disciplinary (what we would now call 'convergent') approach to science." The environment that she created was exciting and inspired each of us to move beyond our own limitations. As Sue once wrote herself, "It is impossible to stay passionate about something you keep looking at in the same way."

The final lesson was, "Have a life outside of science—it gives you perspective." Sue was an adoring and adored mother and wife. She advanced in her own career during a time when there were few role models who could demonstrate how to balance science and family. She corrected that gap by sharing her life with us all, explaining how she approached this balance and how her work benefitted from the distance that her other passions created. As one person recalled about struggling with the decision to continue in science after having a child, Sue "had faith in me, even when I didn't have faith in myself."

In the final few months of her life, Sue wrote to me to say, "I have had an absolutely amazing group of young people to work with over my career." I hope that she appreciated her central and enduring impact in making each of us the scientists that we are today, and through this influence, her legacy will continue, as we pass her wisdom onto our own trainees. ■

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