

A Tribute to Dr. Seymour Reichlin – A role model for vibrant longevity

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In this vignette, Dr. Esther Sternberg contributes to Dr. Seymour Reichlin's Festschrift, describing how he has influenced her career for over 35 years, first as a reviewer of her National Institutes of Health (NIH) research program, then as a mentor, and now as a friend. She explores the elements that have made him a role model for thriving through the decades, and which have kept Dr. Reichlin vibrant beyond his 100th year. She concludes that Reichlin embodies many elements known to contribute to healthy aging and long health spans: many friends and positive intergenerational relationships; a deep sense of meaning and purpose in life; an abiding wonder in the world around him; a great sense of humor and ability to laugh; and, in later years, his own brand of spiritual pursuit.

How We Met

I first encountered Dr. Seymour Reichlin in 1989 when he was on the National Institute of Mental Health (NIMH) Board of Scientific Counselors (BSC) panel reviewing my research in the National Institutes of Health Intramural Research Program (NIH IRP). Back then, these were daunting experiences for those of us in the IRP—like oral PhD thesis defenses, or worse, with at least 10 stern judges, extramural scientists, knives out, ready to grill and pounce. That was the year that I presented my findings showing that the hypothalamic pituitary adrenal axis played an important role in inflammatory disease in a rat model for arthritis (1, 2) and my findings on the pathogenesis of the L-tryptophan eosinophilia myalgia syndrome (3)—an epidemic of eosinophilia and myalgia related to impure L-tryptophan produced by the third largest petrochemical company in Japan. Much to my surprise and relief, though Dr. Reichlin asked tough, probing questions, he was among the most supportive of my research program. He continued to be my cheerleader throughout the years and went on to guide me through other BSC reviews, culminating in my successful tenure and my own Section at NIMH. It was an auspicious beginning to our now over 35-year friendship. He started as my reviewer, became a mentor, and then turned into my friend.

Dr. Reichlin's Role in My Career and the Mind-Body Connection

Knowing that Si was enthusiastic and supportive of my outside-the-box research sustained me when many in the parent disciplines of immunology, rheumatology, neuroscience, neurology, and even endocrinology did not believe in the so-called mind-body connection. However, his openness to new ideas, combined with his ability to judge research on the merits of its rigor and innovation, rather than its fit with conventional knowledge, meant that he not only believed in the concept but also contributed to it in his own unconventional manner. In his landmark 1993 review in the *New England Journal of Medicine*, he proposed that IL-6 released from the pituitary is an important mediator of neural immune interactions during stress (4).

We Meet Again

Over the years, Si and I intermittently crossed paths at the Society for Neuroscience and the Endocrine Society, where he had trained most of

the leaders in those fields. Talking with Si is a living history lesson of endocrinology and neuroendocrinology, and the stories of their pioneers and giants, most of whom he has trained, and many of whom have contributed to this Festschrift. I lost touch with Si, only to reconnect in 2010 when Dr. Andrew Weil invited me to speak at a Mental Health Conference that the University of Arizona's Center for Integrative Medicine was convening in Scottsdale, AZ. I was surprised and delighted to see Si there. But, it was no coincidence. He shared that when Andy told him I would be speaking at the conference, he made the 2-hour drive from Tucson to Scottsdale to meet me! By then, Si had retired from the University of Arizona, where he had been a professor of medicine. He stayed close friends with Andy and others in integrative medicine, including Deepak Chopra, both of whom he had trained and mentored. When Andy then recruited me to create and head the research program for the Andrew Weil Center for Integrative Medicine, Si guided me through the intricacies of university practices, once again, to a successful conclusion. Thus, Si was responsible for getting me to uproot myself from NIH and the East Coast and move to the desert. I am indebted to Si for the productive and fulfilling first and last decades of my career, both at NIH and then at the Andrew Weill Center for Integrative Medicine.

A Lively Intellect and Role Model for Elements that Support Vibrant Longevity

When I think of Si, it is his lively intellect and immense, wide-ranging curiosity that are at the forefront, along with his twinkly eyes, broad smile, and earthy sense of humor. Si is a role model for aging gracefully and vigorously. Always open to new experiences, well into his nineties, he spoke in Iran at a 2016 conference on mysticism and neuroendocrinology (5, 6). This led him down a new path of discovery, into the endocrinology and neuroscience of spiritual and near-death experiences. He loves a good mystery, and like any great detective or investigative journalist, he is currently chasing clues to figure out what happened to a long-lost molecule that might play a role in transcendental experiences.

And there are other aspects of Si, too, beyond his professional pursuits. He is a master woodworker, carving and painting colorful, whimsical wood statuettes of well-known figures, many of which carry a pointed, satirical meaning reminiscent of a political cartoonist. He is an excellent extemporaneous speaker, a riveting storyteller, and a probing questioner. More than once, when he has been in the audience at one of my talks, he is quick to ask a pointed question at the end of the presentation. That has allowed me to call him out and reveal his age to the audience. They gasp and then break out into spontaneous applause. We all agree that he is a poster child for healthy aging.

What are the elements that have contributed to Si's longevity and long health span? Nearly 30 years ago, Sheldon Cohen and Bruce Rabin demonstrated that individuals with more positive relationships experience less stress and fewer illnesses (7). This has been borne out in many studies since [reviewed in Friedman, 2024 (8)]. Si certainly has an abundance of positive relationships and many friends.

However, there is more to positive social relationships than simply having many friends. Research exploring populations with a large





Figure 1. Drs. Seymour Reichlin and Esther Sternberg outside Vivace's Restaurant, overlooking Tucson, Arizona, USA skyline. April 2024. Photo Credit: Dr. Mark Abrams.

percentage of centenarians suggests that long life spans and better health outcomes are associated with rich and varied intergenerational relationships (8, 9). Si has an abundance of those. Arguably he can be considered one of the fathers of modern neuroendocrinology, having trained many leaders in the field. In that case, he is also the grandfather and great-grandfather of the next generations of scientists, and he maintains friendships with all.

The flip-side, loneliness, has many deleterious health effects and is thought to have as profound an impact on health as smoking two packs of cigarettes daily [reviewed in Yang, 2016 (10)]. The health impacts of loneliness, a field pioneered by John Cacioppo (11, 12), have recently been highlighted by Former Surgeon General Vivek Murthy with a call to action, as an epidemic that needs to be addressed (12, 13). While many factors contribute to loneliness, it takes effort to prevent and combat it. I do not believe that Si's abundance of longstanding friendships happened passively or by accident. Intentionality is necessary to maintain friendships across multiple decades, with people scattered across continents. Si works hard to maintain his ties with both old and new friends, even if several months apart, often through shared meals and sometimes requiring arduous travel.

Victor Frankl suggested that meaning is an essential ingredient for resilience and survival (14). Si certainly has a deep sense of meaning and purpose in life, always pursuing scientific questions through his research and writings. Indeed, he is actively researching several lines of enquiry spurred by his curiosity. One of them is spiritual and mystical experiences.

Spirituality is another domain that has been shown to reduce stress and enhance resilience [reviewed in Koenig 2015 (15) and Ransome 2020 (16)]. In later years, Si has developed his own brand of spiritual pursuit, exploring powerful spiritual experiences through the lens of neuroendocrinology and neuroscience. More than any other trait that has, I sus-

pect, sustained Si through the decades, is his abiding sense of wonder in the world around him, in science, in people, in new experiences, and in creative pursuits. Moreover, these, like his interest in the neuroendocrinology of spiritual experiences, possibly triggered by his invitation to speak in Iran on the topic, provide more fodder for his writings and research.

Laughter is thought to reduce stress and enhance well-being [reviewed in Savage 2017 (17)]. Popularized by Norman Cousins in 1979 (18), the concept has since been supported by mechanistic, physiologic, and psychological evidence, including laughter's effects on enhancing dopaminergic systems, reducing blood pressure, and improving overall mental health [reviewed in Savage 2017 (17), Seligman 2004 (19), and Lyle 2023 (20)]. Si is a font of laughter. He has a great sense of humor and the ability to laugh and to make others laugh along with him. This brings him back full circle to that trait that is so important for longevity—many friends. There is nothing so supportive of maintaining friendships as sharing a hearty laugh over dinner together—something I have done with Si many times over the years.

It is hard to believe that Si is 101 years old! He acts, looks, and thinks like he did when I first met him so many decades ago (see Figures 1 and 2). Whether it is his ability to befriend and stay friends with people of all ages and generations, his intrinsic curiosity, his sense of meaning and purpose in life, always pursuing science and discovery, his sense of humor or, more likely all of the above, I only wish and hope that I might follow in his footsteps in this domain and be as lively and vigorous if I reach that age as he is now.

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Figure 2. Drs. Seymour Reichlin and Esther Sternberg sharing a laugh over a birthday dinner—April 2024. Photo Credit: Dr. Mark Abrams.

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