

A questioning mind

Summarize yourself in the form of a title of a paper in Nature.

Passionate curiosity leads to endless frontiers.

What was your first experiment as a child?

My first observation was on silkworms. I was amazed to watch the dramatic changes from egg to larva — a worm that eats only leaves but spins two kilometres of silk — to the moth that emerges from the cocoon to lay more eggs.

Who has been the most important mentor in your career?

Alexander Rich at the Massachusetts Institute of Technology (MIT), who has advanced our understanding of nucleic acids and protein synthesis. His office door has always been open, and I now follow his example.

What makes a good scientific mentor?

The capacity to inspire and give freedom to students and postdocs, to let them explore and make discoveries themselves.

Whose graduate student would you most like to have been (historical impossibility notwithstanding)?

Francis Crick. He is always full of great ideas and restless in intellectual pursuit. He moves from one field to another effortlessly, is very stimulating and is not afraid to ask the big questions that most others do not.

What single scientific paper changed your career path?

Alexander Rich and colleagues reported the discovery of left-handed DNA (A.H.-J. Wang *et al. Nature* **282**, 680–686; 1979) when I was an undergraduate in China. The previous year I had asked my biochemistry professor why all biological helices seemed to be right-handed, and whether there might be left-handed ones. My professor did not know, but that single paper led me to pursue a career with Rich. After many years of learning English and molecular genetics at the University of California, Santa Barbara, I joined his lab at MIT as an American Cancer Society postdoctoral fellow, studying the biological function of left-handed DNA, and this led to my own serendipitous discovery.

What book has been most influential in your scientific career?

One, Two, Three ... Infinity by George Gamow, the great physicist who also proposed the Big Bang theory and the three-letter genetic code. Gamow was a visionary, proposing grand ideas most people thought were crazy. Although not all of his ideas

turned out to be correct, his most important ones have stood the test of time.

What literary character would you employ as a postdoc?

James Bond. He is multi-talented, witty, intelligent, smart, resourceful and fearless. He could move into any research field without hesitation, and would get interesting and exciting results almost single-handedly!

What's your favourite conference destination, and why?

Crete, location of the technologically advanced but mysterious Minoan civilization, and more recently of the biennial workshop on the self-assembly of peptides and proteins in biology, medicine and engineering, an interdisciplinary gathering of scientists and engineers. Francis Crick put it best: in nature, hybrid species are usually sterile, but in science the reverse is often true. Hybrid subjects are often astonishingly fertile, whereas if a scientific discipline remains too pure it usually wilts.

You have the audience in your hands, but some smart-alec asks you the killer question you have no idea how to answer. What's your favourite response?

"We have thought about it, but put it aside temporarily because of a shortage of manpower."

What book currently resides on your bedside table?

Mendeleyev's Dream: The Quest for the Elements by Paul Strathern, a book about the history of science, especially chemistry and medicine.

What music heads the playlist in your car or laboratory?

Mozart, of course! His music is so pure and elegant, even though he composed it amid many distractions and often at the last minute. He was a musical magician!

Assuming the dead can be raised and/or time travel exists, who from the world outside science would you most like to have dinner with?

Mozart, Beethoven, Chopin and Tchaikovsky. I would love to know what inspired them to compose their timeless music.

Where and when would you most like to have lived or worked?

The Cavendish Laboratory in Cambridge in the early 1950s. People then had more time to think deeply about timeless questions, many of which remain unanswered today. Now people work too much and think too little,



Shuguang Zhang

Shuguang (Chinese for 'daybreak') is at the Center for Biomedical Engineering at the Massachusetts Institute of Technology (MIT). He is curious about many things: in 1994, a serendipitous discovery of self-assembling peptides was selected to be one of the 15 achievements of the past 25 years at MIT.

always in a hurry but less concerned about originality, the wellspring of new fields.

You are on a plane behind two students obviously going to the same conference, who start to talk about your work. What do you do?

I would introduce myself and ask them how they can push it further.

What's the best piece of advice you've ever received?

Received from Francis Crick: always ask questions, the bigger the better. If you ask big questions, you get big answers.

What single discovery, invention or innovation would most improve your life?

Three-dimensional cell culture, and the ability to build a tissue or organ from stem cells and a peptide/protein scaffold.

Name one extravagance you can now get away with because of your eminence.

I can invite the most well-known people out for dinner.

What music would you have played at your funeral?

Five Mozart piano concertos: No. 6 (K. 238); No. 9 ('Jeunehomme', K. 271); No. 23 (K. 488); No. 26 ('Coronation', K. 537) and No. 27 (K. 595).

What's just around the corner?

Construction of nanodevices from the bottom up, using biological molecules as nanoscaffolds. ■