

My hero scientist: Professor Nieng Yan

Since I first heard about Prof. Nieng Yan in the news about 4 years ago, she has become my hero scientist. She is energetic and humorous, with attractive sparkling eyes. She studies the structural and chemical basis for membrane transport and lipid metabolism. In 2014, her laboratory solved the structure of GLUT1, a key protein facilitating the transport of glucose across the plasma membranes of mammalian cells whose structure is particularly difficult to determine because it readily changes its shape. In 2015, Yan and her team continued to make progress, solving the structure of GLUT3, an even more complex protein. The news struck the world. This discovery gives us a better understanding of how the glucose is absorbed in the cell. Though no clinical application has yet been provided, the study might help prevent the cancer cells from getting energy from the glucose and control the cancer.

Nieng Yan impressed me as a scientist who follows her heart. After graduating from Princeton, she decided to continue her research in the lab simply because it's the most 'comfortable' job for her. As she said in an interview, "I never feel tired when I am doing experiments." She works for at least 14 hours a day, but is always energetic. Later in 2007, she returned to work in Tsinghua University as a professor. It must be a brave decision, since America has advanced instruments and encouraging research environment. But she followed her heart. Being close to her family enables Nieng Yan to put all of her heart on work. One of her students said, "When we're all leaving the laboratory in the evening, Nieng Yan comes in with her eyes shining." She likes to work in the midnight when the outside is quiet. The happiest thing for her is to do experiment the whole night and then go to bed. She enjoys the process of exploring, experimenting, re-exploring, and re-experimenting till the moment when she succeeds. Nieng Yan believes that scientists need to have a pure mind, focusing on the study only. She chooses to stay away from the profane world. Home and laboratory are all her life. I sometimes wonder whether such life would be monotonous – she even seldom goes to the mall. But Nieng Yan seems to be satisfied with it. Her passion for research makes it natural for her to put all her heart into experiments and studies.

But she is by no means to be boring. Nieng Yan enjoys TV dramas and Kung Fu novels. She also writes blogs. "I wanted to become a journalist in the past." she couldn't help laughing. When Nieng Yan first became a supervisor, she was less than 10 years older than her students. She would compete with them for who can finish an experiment faster. Outside of the lab, the students consider her to be a friend rather than a teacher. Even now, she still sings when walking. She is like a teenager in her forties. Her enthusiasm for life and for her job have never changed.

Nieng Yan is intelligent and interesting. Everything seems to be effortless for her. Maybe only Nieng Yan herself understand the importance of hard work. She is always focused on what she is doing at present and puts 100% effort into it. She believes with hard work, opportunities will come themselves. In the first year at Princeton, she couldn't answer questions asked by the professor. She started to read the articles and books day and night, only sleeping 4 hours at night. When Nieng Yan first entered the lab, she failed in every experiment while another girl in the same lab learnt things much more quickly. Nieng Yan started to have doubts about her ability. However, she didn't give up. She would repeat a same

experiment for hundreds of times, looking for mistakes and making refinements. Things got better slowly but steadily. More than a year later, she succeeded in an intricate experiment. Her tutor said, "You have finally learned how to do experiments." Surprisingly, since then, she succeeds at nearly every experiment. She tries her best, and the luck comes itself.

Nieng Yan believes that there are three stages of research: what you can do, what you want to do, and what ground you can break. When Nieng Yan was young, she wondered what inside of a cell really was. She is trying to answer the question she has asked since childhood, studying what she wants to study. But now she wants to transfer from the second stage to the third stage. As a scientist, she is determined to do something that will open up a new field. She hopes to find a boundary between living creatures and other objects. The basic but crucial work is a challenge. However, it excites her because she always wants to open up a new field. She once joked to her friend: "If ten years later, I'm still a structural biologist, I'll look down on myself." Studying in a completely new area is difficult for Nieng Yan. She must put down all the achievements she has got in the past and experience frustration and failure again. Since she has become a well-known scientist, she will have to work under more pressure than ever. Nevertheless, she still decided to take the step. In 2017, she accepted the offer from Princeton to work as a tenured lecturer. She said that she wanted to jump out of the comfortable area and try her best in a different school, a different system. Money or honor for her is not so important, the work she pursues matters. She told us in an interview, "When you meet something that interests you, just do it."

Nieng Yan is frank and straightforward in expressing her academic views. She never hesitates to argue with prestigious scientists on academic issues, which is rare in China because authority is meant to be respected or unchallenged. Unlike other teachers who give lectures without interaction, she encourages students to express their own ideas. In 2016, an article published in *Nature* by scientist Chunyu Han struck the whole of China. Han claimed to find a new gene editing technique called NaAgo. Nearly the whole country is exhilarated with joy because of the extensive reports on mass media. However, Nieng Yan kept a clear mind. She admitted that if all the data was solid, the work would be fantastic, but she pointed out that it wasn't an innovative research, and it was irrational to dramatize this study. She was attacked on the internet by some people who think she envied Han. But some scientists later claimed that she spoke out what they all wanted to say. Nieng Yan reflected on what happened and realized that she had already possessed some influential power over the public. She decided to use her influence to spread a serious and rational attitude in science.

As a woman scientist, she herself never feels any different from men in the field. She just tried to avoid the title – female scientist. In her opinion, 'female scientist' shows disrespect. "We never say male scientist in daily lives, so why we should we add female in the front of the title?" she cited. However, several years ago, she changed her opinion and started to speak for women. That year, one of Yan's female students decided to give up the PhD study for an ordinary clerical job so that she could give more time to her family. The girl was almost about to graduate. Nieng Yan tried hard to convince her student as she didn't want to waste her intelligence. In the struggle between self-pursuit and the wishes of her family, the girl finally chose the latter one. Nieng Yan realized that women are facing pressure from the society much more than what she thought. She is lucky to get support from her family and friend but most women in China don't. She no longer evades her identity as a woman, but has started to speak in public about women and their career. She even attends TV shows to help the public understand the difficulty women face now. Women can work as excellent as men and live in the way they choose to. Nieng Yan may be the best example.

Nieng Yan breaks the impression of Chinese scientists who are prudent and serious. She represents the young Chinese researchers with open minded and strong character. She not only pays attention to the scientific field, but also the society.

Biography:

My name is Beijia Yuan. I'm a grade 11 student in China. My email address is bethany_yuan@hotmail.com. I'm really interested in chemistry and biology. I first heard of the 1000 girls, 1000 futures program from a friend. At that moment, I was isolated by the boys in the chemistry Olympic competition and was slightly unhappy about my gender. I hoped to know more girls interested in STEM field and get help from a mentor, so I applied for the program. It turns out that my decision was totally right!