

A Time-honored Program, My New Start

— An interview with Francesco Faiola

By XIN Ling (Staff Reporter)

When Francesco Faiola was conducting postdoctoral research at the Icahn School of Medicine at Mount Sinai in New York, he learned from a Chinese coworker that China has been earnestly luring overseas scientists to work in the country. Later, by chance, he got to know scientists from the CAS Research Center for Eco-Environmental Sciences (RCEES) and the Hundred-Talent Program, and decided to apply for the program. "I was expecting a lot [from the program] because China was allocating a lot of research money specifically for foreign talents to boost oversea



collaboration," he said. In 2014, he became a research professor at the State Key Laboratory of Environmental Chemistry and Ecotoxicology under RCEES. Trained as a biochemist and molecular biologist, Faiola's work in Beijing focuses the effects of environmental pollutants on human health.

"The Hundred-Talent Program is a very prestigious program, and very helpful in letting me establish a career as an independent investigator," he told *BCAS*. He suggested that such programs "be advertised more extensively abroad, not only in China".

BCAS: Why did you decide to come to China? How did you get to know the Hundred-Talent Program, and what was your expectation at that point?

Faiola: I was not planning to go to China at the very beginning when I was contemplating the possibility of becoming a professor, after my second postdoctoral experience. However, there was a Chinese postdoc in the lab of Dr. WANG Jianlong, at Icahn School of Medicine at Mount Sinai in New York, where I was working as a postdoc. He was looking for a PI position in China, and asked me to go with him to attend workshops where several Chinese University were recruiting scientists (Chinese and foreigners) with research experience in the States. I then realized that China was investing a lot of money in research

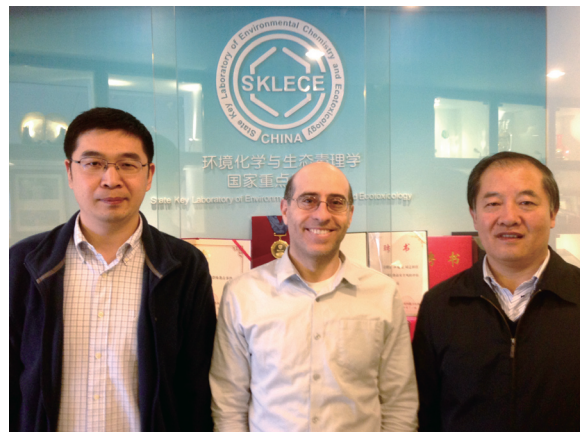
and making it less difficult, compared to the States, for a professor to get grants and be able to afford much more lab personnel. Therefore, I started thinking about the possibility to further pursue my research career in China. Later that year, a professor from RCEES, Dr. LIU Sijin, visited our lab at Mount Sinai, and introduced to me his institute and the Hundred-Talent Program of CAS. He suggested me to apply for a position at RCEES in Beijing, and I did. Then the director general of the institute, Dr. JIANG Guibin, liked my application and made me an offer that I could not refuse. I was expecting a lot from the program because China was allocating a lot of research money specifically for foreign talents and boost oversea collaboration. Thus, I was confident to secure enough research grants.

BCAS: How's your research and life going on in Beijing so far?

Faiola: Research has been great so far. I have been able to buy reagents and instruments without being worried I would not have enough money. Life in Beijing has also been good. I do not speak the language yet, but that did not stop me from getting everything I needed/wanted. Locals are very willing to help me.

BCAS: Which projects are you working on at RCEES? What are your plans for 2015?

Faiola: My research at the RCEES focuses on the effects of environmental pollutants on human health. As model systems, we employ murine and human pluripotent stem cells, specifically embryonic stem cells (ESCs) and induced pluripotent stem cells (iPSCs). These cells can be maintained indefinitely *in vitro* and are pluripotent, in that they can differentiate in virtually all the cells of an adult organism. ESCs and iPSCs are very powerful because we can assess acute toxicity and developmental toxicity. To study acute toxic effects of pollutants, we incubate the cells with the substances of interest and determine the concentrations, if any, at which the cells die, upon short- and long-term exposures. We then select sub-lethal concentrations and investigate the molecular mechanisms of toxicity. For developmental toxicity studies, we take advantage of the ability of pluripotent cells to mimic *in vitro* the early stages of embryonic development. When differentiated in suspension, these cells form 3D-aggregates called embryoid bodies (EBs), which are very similar to early stage embryos. We then analyze whether pollutants disrupt EB differentiation towards the three primary germ layers, ectoderm, mesoderm, and endoderm. We are also interested more specifically in the potential neurotoxicity effects of several traditional and novel pollutants. Therefore we differentiate our pluripotent cells into neuroprogenitor cells (NPCs), and then terminally differentiate neurons. The ultimate goal is to dissect the molecular mechanisms of neurotoxicity, if any. In the lab, we also culture human mesenchymal stem cells. These cells are multipotent and not pluripotent, in that they can only differentiate into specific kinds of cells, such as osteoblasts and



adipocytes. The differentiation protocols are very well-established, so we can potentially address the toxic effects of pollutants on adipose and bone tissue formation. In 2015, we will also implement a recently developed protocol for the differentiation of human ESCs and iPSCs into primordial germ lines, and test the reproductive toxicity of pollutants of interest.

BCAS: How helpful do you think the Hundred-Talent Program has been for your career development?

Faiola: The Hundred-Talent Program is a very prestigious program, and very helpful in letting me establish a career as an independent investigator. For instance, the program facilitated my transition directly from a postdoctoral fellow to full professor, a process that would have taken many additional years in the States.

BCAS: In what ways do you think the Program could be improved in the future?

Faiola: I believe the Hundred-Talent Program should be advertised more extensively abroad and not only in China. Maybe it was just me, but I did not know about it until a Chinese friend mentioned it to me. It would also help to have the application forms and instructions in English. This would eliminate the misunderstanding that in order to be accepted in the program, the knowledge of the Chinese language is absolutely required. Anyway, I just started so I will need more time to come up with additional useful suggestions.