DANYANG ZHU

Jianping Wu, a structural biologist at Westlake University, led work on an ion channel that underpins sperm function.

A new lens for success

The brightest young universities are deliberate in developing a strong sense of their purpose, and leave researchers to chart an independent course. **By James Mitchell Crow**

The drive for growth is a defining characteristic of young universities (50 years old or less, by Nature Index's definition). Although strategies vary, a few themes emerge among some of the fastest-rising young universities in the index. They emphasize sharply defining the university's purpose, recruiting faculty members for high performance and potential, rather than seniority or speciality, and allowing researchers independence to run their own labs.

Hiring for impact

"Our aspiration is to be the best research university in China, but we want research quality, not volume," says Hongtao Yu, dean of the school of life sciences at Westlake University in Hangzhou, China.

Westlake, which was granted university status in 2018, is the youngest research institute in the Nature Index. Despite its short existence, the university's research is already making an impact. In March 2020, for example, Qiang Zhou, a Westlake structural biologist, used cryo-electron microscopy to solve the structure of the human angiotensin-converting enzyme 2 (ACE2), and to show how the SARS-CoV-2 spike protein binds with ACE2 to infect human cells (R. Yan *et al. Science* **367**, 1444–1448; 2020). One of Westlake's youngest faculty members, fellow structural biologist, Jianping Wu, was lead author of a July 2021 paper that describes the long-sought structure of a unique ion channel that is key to sperm motility and fertility (S. Lin *et al. Nature* **595**, 746–750; 2021). "If we have one or two papers like this every year, I think that's success," says Yu.

Westlake is the 13th-fastest riser among the Nature Index young universities, and the 7th fastest for life sciences, in 2019–20, based on increase in adjusted Share. (Share is Nature Index's key metric, measuring the fractional contributions of an institution's affiliated authors to articles published in the 82 high-quality journals tracked by the index. Adjusted Share accounts for the small annual variation in the total number of articles in the journals.)

The university is China's first private, non-profit research-oriented university, and unlike any other in the country, Yu says. "At Westlake, we actively distribute resources toward young PIs [principal investigators]." The more common practice in Chinese institutions is to trickle funds from the most powerful academics down through the faculty ranks.

Westlake also chooses people for their calibre, regardless of field or topic. In the life sciences, research areas in which the school may want to recruit more heavily are being considered, says Yu, although candidate quality remains the deciding factor. "The key is getting the best person to run the lab," Yu says. Faculty members are selected based on research accomplishments, such as publications, but also on the vision that they present to the selection panel. "The roadmap is to grow the life sciences school to 100 faculty in the next three years. We currently have 70, so I think we can get there," says Yu. "The people drawn to come here are really bold and motivated, so that is a self-selection process. The pioneer spirit helps. It's the major driver for success."

Tenure track

In just nine years since its founding, the Southern University of Science and Technology (SUSTech) in Shenzhen, China, has grown to employ almost 600 faculty members. In the Nature Index, it was the fastest-growing young university in the year 2019–20, with a 67% increase to an adjusted Share of 221.61.

Offering tenure track has been key to SUSTech's research performance, says Dongxiao Zhang, provost and vice-president for academic affairs. "It is difficult to get tenure at SUSTech, so only the good research-active scientists dare to join," he says. "It is like a natural filter."

In common with Westlake, but unusually for China, all faculty members run their own independent research lab, regardless of their age. The university aims for high-calibre young scientists by offering internationally competitive tenure-track packages and state-of-the-art facilities. For example, the university's cryo-electron microscopy centre opened in late 2018 with two high-end 300 kV instruments, and a plan to become the biggest such centre in China by installing a further four.

SUSTech has particular strengths in the physical and chemical sciences. Recent highlights include theoretical physics explorations of unusual forms of conductivity and the synthesis of materials with improved thermoelectric performance for energy-harvesting applications. "Our medical school is less than three years old and still recruiting faculty," says Zhang. "In that sector, there is still lots of room for improved performance."

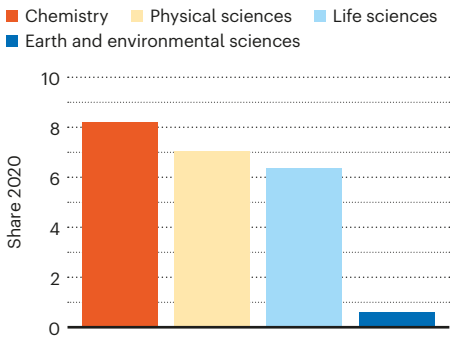
Annual research funding at SUSTech has risen rapidly, and is growing, Zhang notes, with annual external research grants increasing from 850 million yuan (US$130 million) in 2018 to 1,820 million yuan in 2020. "Per-faculty research funding is among the top three in China," he says. SUSTech researchers can compete for the relatively large funding opportunities at the municipal (Shenzhen) and provincial (Guangdong) levels, in addition to national-level funding. Shenzhen sponsorship covers many of the university's operational costs, Zhang says.

An international outlook is promoted, with Chinese and English as joint official languages. About 30% of SUSTech's faculty members are not Chinese citizens, and about 10% don't speak Chinese, Zhang says. "The foreign faculty members feel comfortable, which makes it much easier for us to recruit from overseas."

SUSTech also emphasizes strong collaboration, including a joint PhD programme, with more than 30 partner universities around the world.

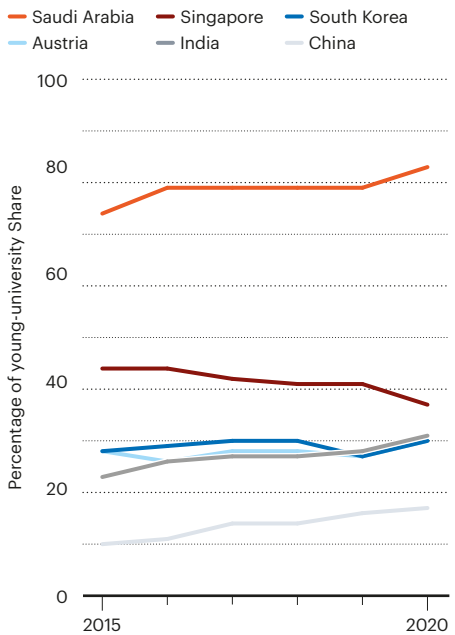
Westlake University, China
NI young university rank: 84
NI academic rank: 522

Subject Share breakdown, 2020



YOUTH ON THE MAP

Of the leading countries by young-university Share in 2020, these six had the greatest proportion of young-university Share to total country Share. King Abdullah University of Science and Technology was responsible for 83% of Saudi Arabia's total Share in 2020.



SOURCE: NATURE INDEX

Attracting attention

The Institute of Science and Technology Austria (IST Austria) in Klosterneuburg leads the ranks of rising young universities in the life sciences in the Nature Index, and is one place ahead of Westlake in the all-subject rising ranking. Started in 2007 with an endowment from the federal government of Austria and intended to be a future flagship for Austrian science, the university follows a strict development plan that is quite different, according to its president, Thomas Henzinger.

Unlike the Austrian research establishment, which is "very traditional, with the emphasis on big professorial chairs", says Henzinger, IST, like Westlake, operates more along Anglo-American lines, based on tenure-track appointments (which are rare in continental Europe) and relatively small, independent research groups.

"Even if someone is hired at age 27, they are a completely independent group leader, which would be unheard of in the wider Austrian university system," Henzinger says. "Our strategy is trying to hire scientists that are among the best in the world at what they do, regardless of what they do." A scientist with the curiosity the institution seeks will have changed their research focus in ten years anyway, he adds.

New faculty hires are aged in their 30s, on average. "Senior people, of the quality we are looking for, are always sought-after and are usually happy where they are. But with young people, there is a job market," Henzinger says. So, the biggest recruitment challenge for IST, he explains, is boosting visibility to attract the best applicants. He says strong performance in university rankings has helped get the word out, including third in the world in the 2019 Nature Index Annual Tables, normalized for size. "That kind of thing has helped tremendously."

Initially funded to grow to 90 research groups by 2026, in September 2021, IST secured federal backing to reach 150 research groups by 2036. "With that €3.3 billion [US$3.7 billion] financing, we will grow at a steady continuous rate for 15 years to come. It's a very big chunk of money for science," Henzinger says.

James Mitchell Crow is a freelance writer based in Melbourne, Australia.