An Equality, Diversity and Inclusion (EDI) co-creation project with Nanchang Joint Programme students: Highlighting the contribution of key Chinese female scientists in Biomedical Sciences

The Nanchang Joint Programme (JP) was established in 2013 as a joint educational programme offered by two universities, Queen Mary University of London (QMUL), in the UK, and Nanchang university (NCU), in China. Students enrolled in this programme are awarded with two degrees, a Biomedical Sciences degree by QMUL and a Clinical Medicine degree by NCU.

Over the years, we have been impressed with the curiosity and dedication of the Nanchang JP students, always keen to engage in extra-curricular activities and enthusiastically respond to new projects and ideas. With this in mind, we started a co-creation project with a group of talented students who expressed an interest in highlighting key female Chinese scientists, whose contribution was less known in other countries, and sometimes even in China. This interest stemmed from the fact the gender gap in STEM disciplines still exists, with these students sharing their personal experience that women still face some prejudice when pursuing a career in science. They presented a poster on this topic during the annual Nanchang Summer School in London, and they were keen to expand their work further, leading to this project.

Exploring the reasons behind this is beyond the scope of this booklet, but we encouraged this project with the hope of inspiring younger generations of women to win/ overcome these challenges, often self-imposed because of cultural reasons, and to understand that a career in science is possible without sacrificing other life commitments.

Being ourselves two female scientists, we were impressed by the passion and enthusiasm these students put into this booklet. We are proud of them and wish them all a bright and successful future, in their personal and professional life. We hope that their example will encourage other women to follow in their footstep, and we wish them that their contributions to the medical field will, one day, be acknowledged by others in a similar booklet.

Giulia De Falco, Professor of Pathology and Molecular Clinical Microbiology, Nanchang Joint Programme, QMUL

Irene Pinzuti, Senior Lecturer in Academic Skills, Nanchang Joint Programme, QMUL

Authors

Chiyue Hu 胡池玥

Chiyue Hu is a member of the Class of 2022 at Queen Mary School of Nanchang University, majoring in clinical medicine and biomedical science. She has earned the bronze award in a national-level innovation competition and received multiple scholarships for her academic performance. Beyond her academic pursuits, she maintains a strong interest in women's social roles. Her participation in a summer camp in London inspired her to focus on collecting examples of female scientists in biomedicine. Through this effort, she aims to highlight the achievements of women in this field and promote broader recognition of their contributions. This booklet stems from her dedication to interdisciplinary exploration, blending scientific inquiry with gender studies. She hopes these stories will encourage greater diversity in scientific research and inspire future generations.

Jiayu Guo 郭珈妤

Guo Jiayu, a student majoring in Clinical Medicine and Biomedical Sciences in the Nanchang University - Queen Mary University Joint Program. As a member of the university's English Translation Team, she helps present campus content globally and promote communication among students. She has maintained strong academic performance and published a research paper as first author. Guo's English skills have earned me multiple national and provincial awards, demonstrating high proficiency. Using this dual expertise, she co-authored an English booklet on Chinese women scientists. She believes this work effectively shares their remarkable stories and contributions with the world.

Jiayu Xu 许佳雨

Jiayu Xu is a member of the Class of 2022 at Queen Mary School of Nanchang University. She has developed a strong interest in clinical trials. She was inspired by her teachers and recognize that many female scientists encounter various barriers and limitations within the scientific research environment. By showcasing the success stories and the challenges faced by acclaimed female scientists, this phenomenon can be revealed. Through these efforts, she aims to contribute in her own way to improving the scientific research environment for women.

Junyi Wu 吴俊仪

Junyi Wu, pursuing dual degrees in Clinical Medicine (Nanchang University) and Biomedical Sciences (Queen Mary University of London), is passionate about biochemistry and clinical medicine. Inspired by the resilience of pioneering women in science, she joins this project to uncover their untold stories of overcoming adversity. She hopes her efforts will underscore the value of diversity and inspire more young women to enter scientific fields.

Qingyuan Cheng 程清源

QingYuan Cheng, class of 2024 undergraduate student in the Clinical Medicine (Sino-UK Joint Degree Programme) at Nanchang University, has demonstrated remarkable commitment to practical engagement through active participation in public service and academic competitions. She was honored with the Outstanding Individual Award for her dedicated involvement in the Nanchang Bird's Nest Library public reading initiative, reflecting a strong sense of social responsibility and spirit of contribution. Combining academic curiosity with practical execution, Cheng has consistently exhibited collaborative ability in cross-disciplinary projects.

Junhua Li 李俊桦

Junhua Li, holding dual degrees in Clinical Medicine from Nanchang University and Biomedical Sciences from Queen Mary University of London, has a deep interest in biochemistry and clinical medicine. Long inspired by how female scientists break through gender barriers while advancing scientific frontiers, she contributed to this project by gathering their little-known, firsthand accounts of overcoming adversity. Her aim is not only to honor their journeys but also to encourage more young women to believe in their value within this field.

Zhihan You游芷晗

You Zhihan, from Class 231 of the Nanchang University – Queen Mary University Joint Program. As a Translation Team member, she specializes in verbal communication, cross-cultural exchange, translation and proofreading. She translates content for the program's official website and engages with UK visiting students, introducing them to Chinese culture while addressing their inquiries. Curious and open-minded, she has a strong interest in cutting-edge technology and continuous self-improvement. She aims to further develop translation skills to contribute more to the team and promote cultural exchange between China and the world.

Yilin Bai 白伊琳

Bai Yilin, from Class 236 of the Nanchang University – Queen Mary University Joint Program. As a Translation Team member, she has won several national English competition awards including the "FLTRP·ETIC Cup" and NECCS. Her expertise covers translation, proofreading, live interpretation, and cross-cultural communication. Bai regularly translates content for the Joint Program’s official website and assist visiting UK students in experiencing Chinese culture, while fostering meaningful dialogue. With proven teamwork and communication skills, she effectively balances academics and extracurriculars. Bai is committed to advancing my translation abilities and contributing further to the team's success.

屠呦呦 Tu Youyou

Tu Youyou, a renowned Chinese pharmacologist and Nobel laureate, currently serves as the Director of the Artemisinin Research Center at the China Academy of Chinese Medical Sciences (CACMS).

The photo of Tu Youyou posed at her home after winning the Nobel Prize

Tu Youyou (b. 1930), a Peking University pharmacognosy graduate (1951), pioneered artemisinin isolation in 1969 as lead investigator of China's "523" antimalarial project. Her systematic screening of 2,000+ traditional remedies and innovative ether extraction (No. 191#, 100% inhibition rate, 1971) [1-2] revolutionized malaria treatment, later recognized by the 2015 Nobel Prize for reducing global mortality by 20% and preventing 100,000 annual African deaths [3].

WHO studies confirmed a 97% cure rate [4], validating her reinterpretation of Ge Hong's 4th-century text. Despite 523 initial failures [5] and delayed domestic recognition, her perseverance under resource constraints—including manual extraction and self-testing [6-7]—overcame both scientific and gender barriers in a male-dominated field.

Tu Youyou faced significant gender-specific challenges throughout her groundbreaking scientific career. As one of the few female leaders in the "523 Project," she encountered overt skepticism from male colleagues who questioned "a woman's capability to lead such critical research" [8], which hindered her access to resources and decision-making authority. The systemic marginalization of women in science manifested clearly in authorship disputes - her seminal 1977 research was published anonymously under "Artemisinin Collaboration Group" [9], reflecting the pervasive "authorship deprivation" disproportionately affecting female researchers [10]. Furthermore, she was excluded from crucial informal academic discussions that typically occurred in male-dominated spaces like smoking rooms [11], limiting her collaboration opportunities. The intense work- family conflict she endured was particularly acute - she often had to leave her young daughter alone to maintain research progress [12], highlighting the disproportionate caregiving burdens faced by women scientists. These barriers likely contributed to the delayed recognition of her achievements; despite her 1970s discovery of artemisinin, she didn't receive the Nobel Prize until 2015 - illustrating the documented 5.5-year "Nobel lag" for female laureates [13]. These intersecting challenges underscore how gender biases created additional obstacles for Tu Youyou at every stage of her scientific journey.

Facing these structural obstacles, Tu Youyou demonstrated extraordinary scientific resilience. To compensate for her perceived lack of authority, she implemented rigorous experimental designs,

repeating each critical validation dozens of times [14]. When excluded from formal academic networks, she innovatively turned to ancient medical texts for inspiration, carving a unique research path [15]. Most strikingly, she volunteered as the first human trial subject for artemisinin—a self-sacrificing commitment that ultimately earned her team's respect [16].

Reference list:

[1] 蒿草青青报春晖:全国优秀共产党员、共和国勋章获得者屠呦呦[J].环球中医药, 2021, 14(08):1363-1365. [Artemisia grass green spring brilliance: National outstanding Communist Party member and winner of the Medal of the Republic Tu Youyou[J]. Global Traditional Chinese Medicine, 2021, 14(08):1363-1365.]

[2] 袁亚男, 朱晓新. 屠呦呦获得 2015 年度诺贝尔生理学或医学奖[J]. 生理科学进展, 2016, 47(3): 042. [Yaun Yanan, Zhu Xiaoxin. Tu Youyou won the 2015 Nobel Prize in Physiology or Medicine[J]. Progress in Physiology, 2016, 47(3): 042.]

[3] Hunt K, Lu S. Nobel prize winner Tu Youyou combed ancient Chinese texts for malaria cure. CNN. 2015 Oct 6.

[4] World Health Organization. (2015). Guidelines for the treatment of malaria (3rd ed.).

[5] Zhang, J., et al. (2016). Artemisinin resistance and its impact on malaria elimination. Infectious Diseases of Poverty, 5(1), 61.

[6] Jacobs, Andrew. 2015. "Tu Youyou: How a Chinese Scientist Discovered a Nobel-Winning Malaria Cure." *The New York Times*, December 12, 2015.

[7] 2015 年 12 月 7 日屠呦呦诺贝尔奖演讲内容 [Nobel Prize speech on December 7, 2015]

[8] Lincoln, A. E., et al. (2012). The Matilda Effect in science: Awards and prizes in the US, 1990s and 2000s. Social Studies of Science, 42(2), 307-320.

[9] Rossiter, M. W. (1993). The Matthew Matilda Effect in science. Social Studies of Science, 23(2), 325-341.

[10] 屠呦呦传记编写组. (2016). 青蒿素之母：屠呦呦传. 科学出版社. [Tu Youyou Biography Writing Group. (2016). The Mother of Artemisinin: The Biography of Tu Youyou. Science Press.]

[11] Lunnemann, P., et al. (2019). The gender gap in Nobel prizes. Palgrave Communications, 5, 46.

[12] Tu, Y. (2016). Nobel Lecture: Discovery of Artemisinin. NobelPrize.org.

[13] Miller, L. H., & Su, X. (2011). Artemisinin: Discovery from the Chinese herbal garden. Cell, 146(6), 855-858.

[14] CCTV (2015) 屠呦呦与青蒿素[纪录片]. CCTV (2015) Tu Youyou and Artemisinin [Documentary].

[15] Alavi, H. (2017). The gendered challenges of scientific discovery. Social Studies of Science, 47(4), 511-532.

[16] Nature. (2011). China's Nobel Prize winner and the politics of science. 478(7368), 153.

颜宁 **Yan Ning**

Yan Ning, an internationally renowned structural biologist, is currently the founding president of the Shenzhen Institute of Medical Sciences and the director of the Shenzhen Bay Laboratory. She is also an academician of the Chinese Academy of Sciences.

The photo of Yan Ning

Yan Ning (born in 1977), graduated with a bachelor's degree from Tsinghua University in 2000 and obtained a Ph.D. in Molecular Biology from Princeton University in 2004. In 2007, at the age of 30, she was appointed as a professor at Tsinghua University, becoming the youngest doctoral supervisor in the university. In 2017, she became the Shirley Tillman Distinguished Professor at Princeton University. In 2022, she returned to China full-time to establish the Shenzhen Academy of Medical Sciences. Her team was the first to determine the three-dimensional structure of the glucose transporter GLUT1 (in 2014) [3], and overcame world-class problems in membrane proteins such as voltage-gated sodium/calcium ion channels. They published 19 papers in Nature, Science, and Cell, with 2 of them selected as "Top Ten Advances in Science" by Science [6]. In 2024, she received the UNESCO "World Outstanding Female Scientist Award".

Yan Ning's scientific career has faced multiple structural challenges.

Facing the gender structural barriers (with only 30% of scientific researchers being women globally, and a significant career cliff for Asian women during their childbearing years), she broke through the obstacles through three strategies - at the individual level, she used 19 top-tier papers such as GLUT1 to empirically demonstrate the scientific research capabilities of women; at the institutional level, she established lactation rooms and flexible working systems in the Shenzhen Medical Research Institute to eliminate barriers; at the systemic level, since 2015, she has initiated an annual forum for female scientists and pushed for a female representation in management exceeding 50%.

In response to the stereotypical expectations of society towards female scientists, she restructured the discourse power with a sharp stance - she immediately refuted the gender presupposition question of "how to balance family and research", defended the privacy boundary with "It's none of your business", and declared "I am a mainstream scientist" to define the professional benchmark.

Her response logic always adheres to the dialectical thinking of transforming the predicament into a driving force: when encountering the academic controversy of Han Chunyu, she publicly emphasized

"the critical spirit of research" to promote self-purification within the academic community; when facing the career bottleneck period, she voluntarily resigned from the permanent teaching position at Princeton and returned to China to establish a new research institution, to open up the "lab-to-clinics" transformation channel.

Reference list:

[1] 闫欣彤."非主流"的主流科学家——颜宁[J].七彩语文, 2024, (15):4-5. [Yan Xintong. “Non-mainstream” mainstream scientists-Yan Ning[J].Colorful Language, 2024, (15):4-5.]

[2] 颜阳.颜宁:一直要追求高目标[J].走向世界, 2024, (12):26-27. [Yan Yang. Yan Ning: Always Pursue High Goals[J].Towards the World, 2024, (12):26-27.]

[3] 周洁.2024 欧莱雅-联合国教科文组织"世界杰出女科学家成就奖"获得者颜宁:勇敢做自己 [J].新民周刊, 2024, (21):64-67. [Zhou Jie.2024 L'Oréal-UNESCO "World Outstanding Women Scientist Achievement Award" winner Yan Ning: Be brave [J].Xinhua Weekly, 2024, (21):64-67.]

[4] 为什么女性需要去参与科学?颜宁这样回答[J].科学大观园, 2024, (06):20-25. [Why do women need to participate in science? Yan Ning replied like this[J].Science Grand View Garden, 2024, (06):20-25.]

[5] 颜宁"非主流"科学家[J].科学大观园, 2018, (05):38-39. [Yan Ning's "non-mainstream" scientist[J].Science Grand View Garden, 2018, (05):38-39.]

[6] 综合央视网,中国新闻周刊.颜宁回国发展才是真正的科学家[J].科学大观园, 2022, (22):76-77. [CCTV, China News Weekly. Yan Ning's return to China for development is the real scientist[J].Science Grand View Garden, 2022, (22):76-77.]

耿美玉 Geng Meiyu

Geng Meiyu, a distinguished Chinese pharmacologist and researcher, currently serves as a professor and senior investigator at the Shanghai Institute of Materia Medica, Chinese Academy of Sciences (CAS).

Geng Meiyu (second from the left) introduces the new drug research and development process at a press conference in Shanghai.

Geng Meiyu, a professor and researcher at the Shanghai Institute of Materia Medica, Chinese Academy of Sciences, is widely recognized for her leadership in developing drugs for Alzheimer's disease and cancer. Yet behind her achievements lies a long and arduous journey, marked by repeated setbacks, skepticism, and financial strain.

Her most well-known accomplishment, the development of GV-971 (sodium oligomannate, trade name "Oligomannate"), took 22 years of continuous effort. The path began in 1997, when Geng observed that Alzheimer's patients' brains contained sugar molecules bound to amyloid-beta proteins.
[1] From this, she hypothesized that sugar-based compounds might regulate the toxicity of amyloid proteins. Initial experiments revealed that oligosaccharides extracted from brown algae could inhibit amyloid aggregation. However, the structural complexity of the compound presented a major obstacle. Even with just a few sugar units, tens of thousands of possible combinations emerged, making precise analysis and quality control extraordinarily difficult. [2]

As the project advanced, Geng's team encountered further difficulties. Early animal studies showed reduced amyloid deposits in the brain, but the results did not fully explain cognitive improvements. At a time when the "gut-brain axis" was largely dismissed, Geng put forward the bold idea that the drug might act through the gut microbiota. This unconventional view drew skepticism and even ridicule from peers. To prove her theory, she and her team spent six years performing over a thousand experiments, eventually showing that GV-971 reshaped gut microbiota, reduced inflammation, and improved cognition. [3]

The clinical process was equally grueling. Phase II trials produced inconsistent data, forcing the team to redesign assessment methods. The Phase III trial, involving 1,199 patients across multiple centers, became the greatest test of endurance. Years of work consumed vast resources; the collaborating company invested billions and even mortgaged its offices to keep the project alive. Geng later admitted that the team came close to disbanding several times. [4]

Reference list:

[1] Available from: http://simm.cas.cn/sourcedb/zw/gb2020/yjsyx/202401/t20240131_6980975.html

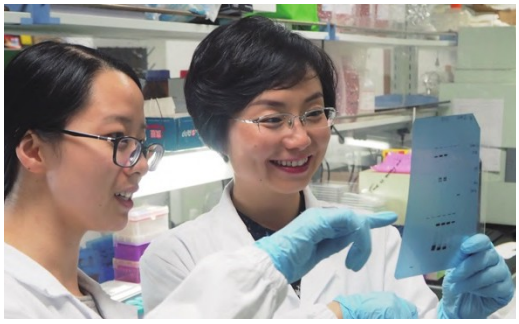
[2] Available from: https://www.cas.cn/xzfc/202505/t20250515_5068345.shtml

[3] Available from: https://www.cas.cn/ky/kyjz/201003/t20100301_2785412.shtml

[4] Available from: https://www.nsfc.gov.cn/Portals/0/fj/hx/637511362385487500890934 8.pdf

陈玲玲 Chen Lingling

Chen Lingling: Charting the Unknown Territory of "Life's Dark Matter"



Chen Lingling (right 1) and her students viewing the RNA test results

Chen Lingling, a leading scientist at the Shanghai Institute of Biochemistry and Cell Biology, has dedicated her career to deciphering the enigmatic world of long non-coding RNAs (lncRNAs), often termed "life's dark matter." Her journey is a testament to navigating uncharted scientific waters, overcoming skepticism, and building breakthroughs from the ground up.

Returning to China to establish her independent research group, Chen faced the daunting reality of an empty laboratory. Starting with a modest "seed fund," she embarked on a venture akin to entrepreneurship: recruiting and training students, building technical platforms from scratch, and tirelessly securing funding [1]. This foundational period demanded immense personal investment and resilience.

Her scientific path was marked by bold challenges to prevailing wisdom. At a time when lncRNAs were thought structurally like messenger RNAs (mRNAs), possessing characteristic "caps" and "tails" (poly(A) tails), Chen proposed a radical idea: the existence of novel lncRNAs lacking these features. Pursuing this hypothesis meant venturing into the unknown, requiring her team to pioneer entirely new methodologies. They had to develop novel techniques to isolate and study these elusive "tailless" RNAs, a high-risk endeavor with no guarantee of success [1, 2]. This spirit of questioning established norms defined her approach.

The exploration of circular RNAs (circRNAs), a specific class of lncRNA she helped characterize, presented unique hurdles. With no established research protocols, her team had to design bespoke experiments. Developing tools like the "nascent circRNA capture and detection system" (by Zhang Yang) to quantify their unique properties or constructing intricate fluorescent reporter screening systems (by Li Xiang) to identify regulators, involved navigating constant setbacks and failures inherent in pioneering work [1]. Chen embraced this uncertainty, famously remarking with characteristic optimism that "research" inherently implies repetition ('re-'), viewing the opportunity to pioneer a field as a privilege and the establishment of new knowledge as the ultimate reward [1].

Translating discoveries into clinical impact brought its own set of obstacles. For Prader-Willi syndrome (PWS), the challenge was diagnosing a condition caused by a genetic region devoid of protein-coding

genes. Chen's identification of sno-lncRNAs as biomarkers offered hope but required detecting vanishingly low levels in minute blood samples – a sensitivity barrier her team, collaborating with hospitals, eventually overcame [1]. Similarly, exploring circRNA as a therapy for lupus demanded designing molecules that potently inhibited the PKR immune pathway while avoiding triggering unwanted immune responses themselves – a delicate balance her team achieved through innovative molecular design [1].

Beyond the bench, Chen navigated the dual pressures faced by many female scientists. She openly acknowledged the "greater wisdom" required to balance demanding research leadership with societal and family expectations during her scientific prime [3]. Her pragmatic approach extended to leveraging an unexpected asset: an MBA degree earned during her PhD. Initially seen as an extra burden, the management skills proved invaluable in running her laboratory efficiently, demonstrating a unique fusion of scientific and operational acumen [1, 3].

Driven by an insatiable curiosity for the unknown, Chen Lingling's story is one of intellectual courage and perseverance. From confronting an empty lab and challenging dogma to inventing new tools and translating findings for patient benefit, her journey illuminates the path of a true scientific pioneer, steadily mapping the complex landscape of lncRNAs and inspiring future generations to explore biology's hidden dimensions.

Reference list:

[1] 黄宇翔. 陈玲玲和环形 RNA 结缘的故事 [J]. 世界科学, 2024, (03): 31-34. [Huang Yuxiang. The Story of Chen Lingling and Circular RNA [J]. World Science, 2024, (03): 31-34.]

[2] 为“生命暗物质”正名的人 [J]. 科技导报, 2017, 35(22): 112. [The Person Who Vindicated "Life's Dark Matter" [J]. Science & Technology Review, 2017, 35(22): 112.]

[3] 甘晓, 徐昭. 中国科学院分子细胞科学卓越创新中心研究员陈玲玲：杰青项目给我“独辟蹊径”的勇气和胆识 [J]. 科学新闻, 2024, 26(04): 26-29. [Gan Xiao, Xu Zhao. Researcher Chen Lingling from Center for Excellence in Molecular Cell Science, CAS: The Outstanding Youth Project Gave Me the Courage and Insight to 'Blaze New Trails' [J]. Science News, 2024, 26(04): 26- 29.]

宋相容 Song Xiangrong

The photo of Song Xiangrong

Song Xiangrong: Navigating Challenges on the Frontier of mRNA Medicine

Song Xiangrong stands as a pivotal figure in China's pursuit of innovation in mRNA therapeutics. As a professor at Sichuan University's West China Hospital and co-founder of WeStem Biotech, her journey has been defined by overcoming significant obstacles in a nascent field, driven by a deep-seated commitment to developing effective medicines for her country.

Song's path was marked by a critical pivot early in her career. After initial research into DNA and siRNA drugs revealed substantial safety concerns and poor manufacturability [1], she faced a crossroads. In 2013, guided by Academician Wei Yuquan, she made the bold decision to shift her focus entirely to mRNA therapeutics – a domain then in its global infancy with only about 50 clinical studies worldwide and virtually unexplored in China [2]. This meant venturing into uncharted territory, requiring her to rebuild her expertise from the ground up. Demonstrating remarkable dedication, Song, already in her thirties, returned to the classroom. She spent three years immersing herself in biology to master mRNA fundamentals, later undertaking further studies in immunology and nanomedicine at Harvard University to keep pace with the field's rapid international advancements [3]. This period exemplified her resilience and commitment to lifelong learning in the face of professional uncertainty.

Pioneering mRNA research in China presented formidable barriers beyond knowledge gaps. The field was a near-complete void domestically. Early progress was severely hampered by the exorbitant cost and lengthy importation times for essential lab reagents sourced primarily from the US [2]. Determined to break this dependency, Song spearheaded efforts to establish a complete, localized mRNA production process. Her team's success in achieving gram-scale production of critical materials – a stark contrast to the previous availability only in costly microgram quantities – dramatically reduced costs and liberated her research from external constraints [2]. Building a competent team from scratch in such a specialized and emerging field added another layer of complexity, demanding constant interdisciplinary bridging.

Balancing her expanding roles became another major challenge. As her reputation grew, Song juggled the intense demands of being a principal investigator, doctoral advisor, academic leader, and biotech company co- founder. This "forced growth," as she wryly termed her transition into entrepreneurship,

required rapidly acquiring skills in management and intellectual property far beyond her core scientific training [3]. The relentless pace meant personal sacrifices were routine. Her days stretched long, requiring nightly reviews of reports from students and employees before 10 PM [2], and work often encroached on weekends. "Research is very demanding; sometimes I work on Sundays because there's always more to learn," she acknowledged [3], highlighting the personal toll of driving innovation.

Song's perseverance stems from a conviction forged early on. Influenced by a high school teacher's remark that "a successful medicine can help thousands, more than being a doctor," she chose pharmacy over the more popular clinical medicine path [3]. This resolve solidified during her first university lecture, where a professor's probing question about choosing expensive imported drugs versus affordable domestic ones starkly revealed China's pharmaceutical gap [3]. It ignited her enduring mission: to create "good medicine for Chinese people." This deeply personal commitment fueled her through setbacks and the arduous journey of establishing mRNA drug development in China, transforming her from an idealistic student into a leader shaping the future of biopharmaceutical innovation.

Reference list:

[1] "宋相容研究员对我院进行科研和学科建设指导" [Song Xiangrong Researcher Provides Scientific Research and Discipline Construction Guidance to Our College], Harbin Medical University, November 8, 2024.

[2] "拓荒者宋相容:10 年专攻 mRNA 药物,做中国人的好药" [Pioneer Song Xiangrong: 10 Years Dedicated to mRNA Drugs, Making Good Medicine for Chinese People], Huaxi Metropolitan Daily, March 16, 2023.

[3] "宋相容：10 年专攻 mRNA 药物 希望做中国人自己的好药" [Song Xiangrong: 10 Years Dedicated to mRNA Drugs, Hoping to Make China's Own Good Medicine], Cover News, March 8, 2023.

陈子江 Chen Zijiang

Chen Zijiang, a renowned Chinese reproductive medicine specialist and Academician of the Chinese Academy of Sciences, currently serves as the Director of the National Research Center for Assisted Reproductive Technology and Reproductive Genetics.

The photo of Chen Zijiang, academician of the Chinese Academy of Sciences, attended the event and gave lectures at the Qilu Reproductive Endocrinology Summit

Chen Zijiang (b. 1959) stands as a pioneering figure in China's reproductive medicine. After graduating from Shandong Medical University, she made history in 1992 by achieving China's first successful gamete intrafallopian transfer (GIUT) birth under the mentorship of renowned gynecologist Su Yingkuan. Her groundbreaking work continued with the nation's first PGD-prevented hereditary deafness birth through the discovery of multiple disease-causing genes. In 2019, she attained dual recognition as Academician of the Chinese Academy of Sciences and the first Chinese Executive Secretary of the International Federation of Fertility Societies in its 50-year history [1]. She currently directs the National Engineering Research Center for Assisted Reproductive Technology while having established 10 clinical guidelines that standardized PCOS diagnosis and treatment nationwide [2].

Driven by her "physician-scientist" philosophy, Chen bridges clinical practice with fundamental research. Her approach stems from the belief that "medical progress requires doctors who innovate from 0 to 1", a principle she implemented through rigorous evidence-based studies [1]. When the reproductive medicine field faced contentious debates about PGT-A technology commercialization, her team conducted landmark research published in the New England Journal of Medicine (2021) that demonstrated the technology's limitations in non-advanced-age patients [3]. Beyond laboratory research, she has navigated complex clinical dilemmas where fertility preservation conflicted with cancer treatment, developing the concept of "comprehensive evaluation for individualized solutions" that balances medical necessity with reproductive outcomes [4].

Chen's scientific leadership faced substantial challenges throughout her career. Early GIUT procedures achieved only 19.1% clinical pregnancy rates with significant instrumentation difficulties [5]. She courageously challenged the widespread adoption of PGT-A technology when her research revealed it reduced cumulative live birth rates in younger patients (77.2% vs 81.8%), despite facing considerable commercial pressures and patient demands. Her team's meticulous work provided crucial evidence that redefined international clinical practice standards, demonstrating her commitment to ethical medical

innovation over technological expansionism [3].

At the age of 33, she became the youngest professor and subject leader since the university's founding after her breakthrough at GIUT. Her resourcefulness and determination exemplify how she can turn limitations into opportunities. Now, she leads the field of reproductive medicine in China, mentoring new experts while advocating for the integration of clinical insights with scientific innovation—a legacy that shapes global practice [1].

Reference list:

[1] 陈子江：行稳致远久久为功[J].科技创新与品牌, 2022, (08):56. [Chen Zijiang: Steady and long-term achievements[J]. Science and Technology Innovation and Brand, 2022, (08):56.]

[2] 陈子江：孜孜不倦求解患者“生命之问”[J].发明与创新(大科技), 2020, (08):1. [Chen Zijiang: Tirelessly solve the "question of life" of patients[J]. Invention and Innovation (Big Science and Technology), 2020, (08):1.]

[3] 裘佳.要严格把握第三代试管婴儿技术适应证[N].医师报, 2021-12- 09(A03). [Qiu Jia. It is necessary to strictly grasp the indications of third-generation IVF technology[N]. Physician Journal, 2021-12- 09(A03).] DOI:10.44211/n.cnki.nysbz.2021.001208.

[4] 王璐.防控出生缺陷让生命健康起航[N].医师报, 2022-12- 01(B02). [Wang Lu. Prevention and control of birth defects allows life and health to set sail[N].Physician Journal, 2022-12- 01(B02).] DOI:10.44211/n.cnki.nysbz.2022.000749.

[5] 陈子江,冯云,苏应宽.宫腔配子移植术 44 例报告[J].中华妇产科杂志, 1996,(09):52-53. [. Chen Zijiang, Feng Yun, Su Yingkuan. Chinese Journal of Obstetrics and Gynecology, 1996,(09):52-53.]

金梅林 Jin Meilin

Jin Meilin, a distinguished Chinese veterinary scientist and academician of the Chinese Academy of Engineering, currently serves as a professor at the College of Veterinary Medicine, Huazhong Agricultural University.

The photo of Jin Meilin

Jin Meilin, an academician of the Chinese Academy of Engineering and professor at Huazhong Agricultural University, is a leading expert in animal disease prevention and control. Over her decades-long career, she has achieved remarkable breakthroughs, but her path was defined as much by hardship and persistence as by success.

One of her most daunting challenges came during the 2018 outbreak of African swine fever. The disease spread rapidly, threatening China's pig farming industry and food security. At that time, there was no effective vaccine worldwide, and the task of finding solutions seemed nearly impossible. Jin led her team in urgent research under intense time pressure, working day and night to develop vaccines and related diagnostic tools. The uncertainty of success and the sheer weight of national expectations became a heavy burden. [1]

Equally difficult was the challenge of technology promotion. Even after her team developed advanced diagnostic kits and vaccines, ensuring their adoption among farmers was another battle. Jin personally went to farms in Hubei and Qinghai, sometimes teaching smallholders face-to-face how to use diagnostic strips. This hands-on effort required not only scientific rigor but also patience and communication, bridging the gap between laboratory innovation and grassroots practice. [1]

Scientific innovation brought its own pressures. Jin's team was constantly tasked with improving sensitivity and efficiency of diagnostic technologies, such as developing nucleic acid test kits that achieved a 100-fold increase in sensitivity through nanomaterials and liquid chip technology. The demand for continuous breakthroughs meant facing repeated setbacks in experiments and the uncertainty of whether years of effort would bear fruit. [1]

Her earlier career also reflected extraordinary perseverance. When pig dysentery entered China in 1978, Jin dedicated eight years to solving the problem. She tackled the bottleneck of isolating strictly anaerobic pathogens, developed innovative culture systems, and created immune diagnostic techniques. Through persistence, her team successfully curbed the disease's spread, but the process demanded long hours in the lab and unyielding determination against frequent failures. [1]

Jin Meilin's journey illustrates the resilience required of a scientist working at the intersection of research and public health. From the lab to the farm, from crisis response to long-term innovation, she has endured pressure, doubt, and relentless obstacles. Yet, it is precisely these struggles that shaped her

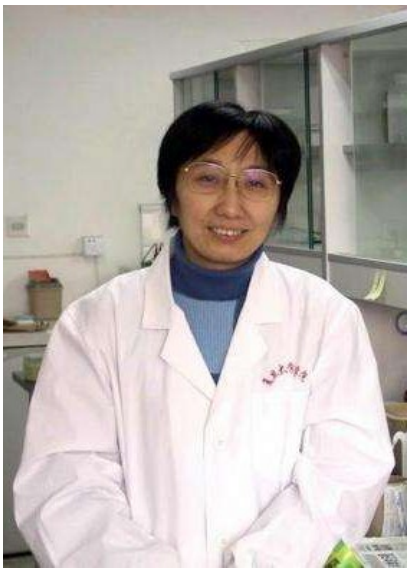
as one of China’ s most respected veterinary scientists, proving that true breakthroughs emerge from the courage to persist in the face of adversity.

Reference list:

[1] 张泉, 屈婷. 科研"玫瑰" 如此绽放——专注动物传染病防治的"巾帼院士"金梅林 [N]. 光明 日报, 2025-03-06(002). [Zhang Quan, Qu Ting. Scientific research "roses" bloom like this - "female academician" Jin Meilin, who focuses on the prevention and control of animal infectious diseases [N]. Guangming Daily, 2025-03-06(002).]
Available from: https://jyt.hubei.gov.cn/bmdt/gxhptlm/mtjj/202503/t20250306_5564050.shtml

马兰 Ma Lan

The photo of Ma Lan posed at her laboratory



Ma Lan, a distinguished Chinese neuroscientist and academician, currently serves as a Professor at Fudan University and is the former Dean of its Brain Science Research Institute and School of Basic Medical Sciences. She was elected as an academician of the Chinese Academy of Sciences in 2019.

Ma Lan (b. 1958), a prominent neuroscientist and academician at Fudan University, has made groundbreaking contributions to GPCR signaling and addiction mechanisms. Her team discovered novel functions of Arrestin proteins, expanding their role beyond traditional signal "braking" and opening new avenues in GPCR research. She elucidated molecular and neural circuit mechanisms through which opioids and cocaine hijack the brain's reward system, strengthening drug-associated memory and driving addiction relapse. Notably, she identified the critical role of the β-Arrestin pathway in modulating morphine addiction.[1]

Elected as an academician of the Chinese Academy of Sciences in 2019, she has led Fudan University's Institute of Brain Science and served as dean of the Basic Medical School. She heads an Innovative Research Group of the NSFC and has been principal investigator of multiple major national research projects [2].

Ma Lan confronted formidable scientific and personal challenges after returning to China in 1995, embarking on the globally significant puzzle of opioid addiction—a field plagued by ineffective treatments for psychological dependence and relapse. Her research began under severely constrained conditions, with China's scientific infrastructure lagging far behind the U.S. in funding, equipment, and technical support. As a key advocate for China's brain initiative, she faced intense international competition from already-launched brain projects in the U.S., EU, and Japan, striving for breakthroughs under immense pressure. On a personal level, she relinquished U.S. permanent residency and high-quality living conditions, persevering through prolonged uncertainty—acknowledging that developing anti-addiction therapies could require "over ten years, or even a lifetime" of effort without guaranteed success, reflecting her profound dedication to overcoming

systemic and individual obstacles in science.

Facing the choice between a well-established life in the U.S. and contributing to her homeland, Ma Lan chose in 1995 to relinquish her permanent residency and return to China, becoming a young doctoral supervisor at Shanghai Medical University. Determined to produce research achievements in the name of China, she led her team to focus on the molecular mechanisms of opioid addiction. After years of persistent effort, her group made internationally recognized breakthroughs, such as elucidating the critical role of GRK in opioid receptor phosphorylation—work published in top-tier journals and listed as a major national scientific advancement. All these outcomes were accomplished under Chinese institutions, fulfilling her pledge to develop "China's knowledge" with independent intellectual property. Despite reaching academic excellence, she remains committed to discovering anti-addiction therapies, humbly viewing true success as developing medicines that can alleviate drug dependence.[3]

Reference list:

[1] 复旦大学脑科学研究院官网 [Official website of the Institute of Brain Sciences, Fudan University]

[2] 脑科学世界公众号(2019). 新科院士马兰：加强对脑疾病研究，是国家和百姓需求，是科学家的责任 [Brain Science World Public Account (2019). Academician Ma Lan: Strengthening the research on brain diseases is the need of the country and the people, and it is the responsibility of scientists]

[3] 中国医科大学(2023).院士之友马兰 [China Medical University (2023).]

乔杰 Qiao Jie

Qiao Jie, A leading Chinese reproductive medicine specialist and Academician of the Chinese Academy of Engineering, currently serves as the director of the Department of Medical Sciences of the National Natural Science Foundation of China.

The photo of Qiao Jie (middle), Xie Xiaoliang and Tang Fuxiao of Peking University and the world's first case of MALBAC baby.

Qiao Jie (b. 1964), a Peking University Health Science Center graduate and China's first reproductive medicine Academician of the Chinese Academy of Engineering, pioneered the establishment of China's PCOS diagnostic criteria and revealed key inflammatory and gut microbiota-bile acid-IL22 axis mechanisms in its pathogenesis [1].

She significantly improved oocyte and embryo cryopreservation techniques, boosting clinical pregnancy success, and applied PGT-M technology to help over 1,800 families (involving nearly 700 genetic diseases) deliver healthy babies [2].

Leading the construction of one of the world's largest and most comprehensive reproductive medicine centers (handling over 500,000 outpatient visits and 20,000 ART procedures annually), she witnessed and facilitated the birth of Mainland China's first IVF and its next-generation baby [3]. Her team achieved the first global application of MALBAC technology for single-oocyte whole-genome sequencing and deciphered the DNA methylation network in early human embryos, elevating China's PGT technology to world-leading levels [2].

Despite severe constraints in time, funding, and research infrastructure in her early career—often struggling to balance clinical duties, administration, and research—Qiao Jie persevered. She even used personal savings to purchase gene chips for PCOS research while training at Stanford in 2003 [1]. In a field where clinical pregnancy rates via ART remain around 40%, she led efforts to build China's largest integrated fertility treatment system and ovarian tissue bank [2].

As a prominent female scientist, Qiao Jie has been vocal about the challenges of reconciling professional ambitions with family responsibilities. She actively promotes shared parenting duties and

has fostered a research environment where women thrive—evidenced by a team consisting of 80% female researchers, including five awarded the National Science Fund for Distinguished Young Scholars [4]. The recipient of three State Science and Technology Progress Awards, she remains a transformative leader in reproductive medicine while serving as Executive Vice President of Peking University Health Science Center.

Reference list:

[1] 杨曦,甘晓.中国工程院院士乔杰：杰青项目为“人类的繁衍”提供科学养料[N].中国科学报,2024-10-28(004). [Yang Xi, Gan Xiao. Qiao Jie, Academician of the Chinese Academy of Engineering: The Jieqing Project provides scientific nourishment for "human reproduction"[N]. China Science Journal,2024-10-28(004).] DOI:10.28514/n.cnki.nkxsb.2024.002422.

[2] 黄杨子.中国工程院院士乔杰：打开胚胎发育失败“黑匣子”[N].解放日报,2024-10- 26(006). [Huang Yangzi. Qiao Jie, academician of the Chinese Academy of Engineering: Opening the "black box" of embryonic development failure[N]. Jiefang Daily, 2024-10- 26(006).] DOI:10.28410/n.cnki.njfrb.2024.005094.

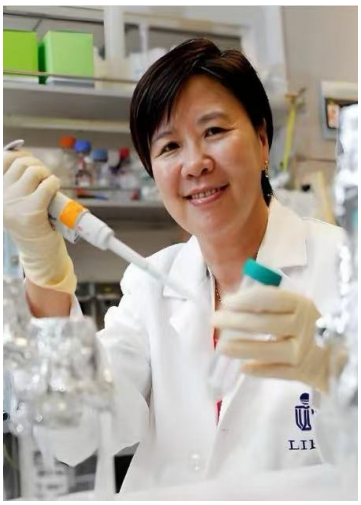
[3] 本刊编辑部.乔杰生命起源健康“守门人”[J].健康中国观察, 2023, (01):19-21. [Editorial Department of this journal. Qiao Jie's life origin health "gatekeeper"[J]. Health China Observation, 2023, (01):19-21.]

[4] 王兆昱,李晨阳.北京大学常务副校长兼医学部主任乔杰：如何看待不婚不育保平安[N].中国科学报,2023-11-15(004). [Wang Zhaoyu, Li Chenyang. Qiao Jie, Executive Vice President and Director of the Department of Medicine of Peking University: How to view the safety of non-marriage and infertility[N]. China Science Journal, 2023-11-15(004)] DOI:10.28514/n.cnki.nkxsb.2023.002615.

叶玉如 Nancy Yuk-Yu

Nancy Yuk-Yu, a Hong Kong-born neuroscientist, is the President of the Hong Kong University of Science and Technology (HKUST) and a world-renowned expert in neurobiology. Elected to the Chinese Academy of Sciences in 2001, she holds memberships in the US National Academy of Sciences and The World Academy of Sciences (TWAS).

The photo of Nancy Yuk-Yu posed at her laboratory



Nancy Ip (b. 1955), a pioneering neurobiologist, has made transformative contributions to both fundamental neuroscience and neurodegenerative disease research. She systematically deciphered the signaling mechanisms of neurotrophic factors—particularly brain-derived neurotrophic factor (BDNF) and its receptors—elucidating their critical roles in neuronal development, survival, and synaptic plasticity, the fundamental basis of learning and memory. Her groundbreaking work on Alzheimer's disease (AD) led to the discovery of multiple blood-based biomarkers for early screening and diagnosis, and she has identified novel therapeutic targets, providing a crucial framework for developing new AD treatments.

An acclaimed academic leader and a Member of the Chinese Academy of Sciences, Foreign Associate of the US National Academy of Sciences, and Fellow of The World Academy of Sciences, Ip has been honored with the L'Oréal-UNESCO For Women in Science Award (often termed the "Women's Nobel Prize") and China's State Natural Science Award (Second Class). She currently serves as the President of The Hong Kong University of Science and Technology.

Nancy Ip overcame significant professional and personal challenges throughout her scientific career. As a mother of two, she struggled to balance her demanding research and leadership roles with family life, often sacrificing time with her children and experiencing lingering guilt. [1] Professionally, she transitioned from a chemistry background into neuroscience, requiring her to master entirely new fields such as biology and medicine during her graduate studies. Despite these obstacles, her perseverance led to groundbreaking work on Alzheimer's disease—motivated by her aunt's suffering and her mother's hope for a cure. She identified novel drug targets and developed a promising therapeutic antibody, aiming to create the first Alzheimer's treatment led by Chinese scientists. [2]

Born into a modest Hong Kong family, Ip excelled academically, earning a Ph.D. from Harvard and establishing a successful research career in the U.S. However, driven by a sense of responsibility to her homeland, she returned to Hong Kong in 1993 to build a research team at HKUST from scratch. Today, as the first female president of HKUST, she continues to lead innovative research while nurturing the next generation of scientists.[3]

Reference list:

[1] 东方早报.(2004)《叶玉如：科学与生活之间的美妙平衡》专访 [Oriental Morning Post. (2004) Interview with Ye Yuru: The Wonderful Balance Between Science and Life]

[2] 凤凰周刊. (2023). 香港科技大学校长叶玉如："现在是做科学研究最好的时代" [Phoenix Weekly. (2023). HKUST President Nancy Ip: "Now is the best time to do scientific research"]

[3] 《江门日报·青苹果》校园专刊 ["Jiangmen Daily, Green Apple" campus special issue]

王志珍 Wang Zhizhen

Wang Zhizhen, a distinguished Chinese biochemist and molecular biologist, currently serves as a researcher at the Institute of Biophysics, Chinese Academy of Sciences (CAS).

The photo of Wang Zhizhen

Wang Zhizhen, a renowned Chinese biochemist and molecular biologist, has had a life full of groundbreaking research and significant challenges. Born in Shanghai in 1942, she began her academic journey at the China University of Science and Technology, eventually finding herself at the forefront of crucial protein research in the early stages of molecular biology. [1] Despite her remarkable achievements, Wang's career has not been free of obstacles.

One of the most profound challenges in her career was the period of upheaval during the "Cultural Revolution." After completing her studies, she was initially assigned to a labor-intensive role at the Shijingshan Steel Factory during the "Four Cleanups" movement, far from her scientific interests. It was a turbulent time, and the academic environment was far from ideal for pursuing scientific endeavors. However, Wang's persistence led to her eventual transfer to the insulin structure research group in 1974, a pivotal moment in her career. [1]

Wang's academic resilience was further tested in the 1970s and 1980s, when she sought international exposure to expand her scientific knowledge. She was awarded the Humboldt Scholarship in 1979, enabling her to conduct research in Germany and the United Kingdom. This international experience broadened her academic horizons and brought her work to the global stage, but it also came with its own set of challenges. As a Chinese scientist working abroad, Wang faced the added pressure of proving herself in a competitive, international scientific community. [2]

Despite these setbacks, Wang's contributions to biochemistry and molecular biology, especially her groundbreaking work on protein folding enzymes, became increasingly recognized. Her research on protein disulfide isomerase and its role in protein folding opened new frontiers in understanding molecular chaperones. Her innovative work on insulin's chemical properties, including the structural interactions of insulin A and B chains, earned her numerous prestigious awards, including the National Natural Science Award. [3]

Yet, despite her significant scientific contributions, Wang Zhizhen's path to recognition was not straightforward. Her scientific pursuits were often met with skepticism and resistance, and it was only after years of perseverance and dedication that she received the respect and accolades she deserved.

Throughout her career, Wang faced both societal and academic barriers, particularly in the male-dominated world of science. These challenges underscored her tenacity, as she continued to break new ground in molecular biology, earning her a place as one of China' s leading scientists. [4]

Wang Zhizhen's story is one of resilience, determination, and overcoming adversity. Through her innovative research and unwavering commitment to science, she has not only contributed to the global scientific community but also paved the way for future generations of researchers.

Reference list:

[1] Chinese People's Political Consultative Conference (CPPCC). Available from: https://www.baike.com/redirect_link?url=http://www.93jx.org/news/2286.html&collect_params=%7 b (accessed September 10, 2025).

[2] All-China Women's Federation (ACWF). Available from: https://www.baike.com/redirect_link?url=http://www.cppcc.gov.cn/2011/09/24/ARTI131685030803 1105.shtml&collect_params=%7b (accessed September 10, 2025).

吴青青 Wu Qingqing

Wu Qingqing, a distinguished Chinese obstetrician and ultrasound specialist, currently serves as the Deputy Director of the Beijing Obstetrics and Gynecology Hospital and the Vice Chair of the Ultrasound Department at Capital Medical University.

A photo of Doctor Wu Qingqing taken in her office at the hospita

The current Vice President of Beijing Obstetrics and Gynecology Hospital affiliated with Capital Medical University, as well as the Deputy Director of the Ultrasound Department of Capital Medical University, and the Chief Expert of the Ministry of Science and Technology's "14th Five Year Plan" project. She has been deeply involved in the field of obstetric ultrasound for over 30 years and is a cornerstone of the field. [1]

In 1983, Wu Qingqing studied in the Medical Department of Shanxi Medical College and obtained a bachelor's and master's degree consecutively. Later, she was admitted to the Obstetrics and Gynecology major of Peking University School of Medicine with excellent grades to pursue a doctoral degree. Later, she worked at the Beijing Maternity and Child Health Hospital affiliated with Capital Medical University. She is passionate about academics and has also visited and studied at the Maternal and Fetal Medicine Center of the University of Sydney Hospital in Australia in her spare time. Her brief life abroad made her deeply feel her patriotic enthusiasm and the value of life she wanted to achieve.

She conducted ultrasound diagnosis consultations for difficult and high-risk cases, and no matter how late she arrived, she demanded that she treat every patient equally and diagnose them with the same patience. With rich diagnosis and treatment experience, solid theoretical accumulation, and positive psychological state, we have solved a large number of difficult cases of fetal birth defects diagnosed by ultrasound both inside and outside the hospital. In this way, Wu Qingqing persisted in the "little black room" of ultrasound diagnosis for 22 years and turned it into a "bright room", bringing hope to patients and achieving the continuation of life. [2]

Wu Qingqing faces many difficulties and challenges in her work and professional field. In terms of work, the tasks are complex, including visits, meetings, case follow ups, work summaries, academic

projects, translation tutorials, and large sample statistics, which keep her busy without any fatigue or irritability. Moreover, the ultrasound doctor community generally has health problems, with many people suffering from vision loss, cervical spondylosis, and lumbar spondylosis. The ultrasound room is always closed, and doctors leave early and return late, hardly getting any sunlight. In the professional field, prenatal ultrasound diagnosis is extremely difficult. Although the fetus is a miniature version of an adult, the complexity and danger of the disease are even greater. Ultrasound doctors need to use probes and images to track the clues of the disease. The black and white slice images captured by the probe determine whether the unborn baby can be born smoothly. Ultrasound doctors face great pressure and responsibility. At the same time, there are also new challenges, such as children wearing glasses at a young age due to genetic and other factors. It is urgent to solve these problem. However, even so, she remained steadfast in her post and witnessed many miracles and genuine doctor-patient relationships, such as some children who were predicted to be *sentenced to death* by other hospitals surviving and growing up healthy with precise ultrasound images and diagnostic experience. [3]

She always interprets the purpose of serving the people, contributes to China's health field with practical actions, promotes the development of ultrasound field with wisdom and talent, cultivates the spirit of dedication with the compassion of doctors, and interprets the great love of humanity.

Reference list:

[1] Wu Q. 北京妇产医院. Beijing Obstetrics and Gynecology Hospital website. 2025 Sep 18. Available from: https://www.bjogh.com.cn/xwzx/article/27992.html

[2] Zheng M. 吴青青: 打破超声诊断领域的壁垒. 时代医讯公众号. 2021 Oct 21. Available from: https://www.cogonline.com/info/132792676854337970

[3] Beijing Obstetrics and Gynecology Hospital. 肩负为医为师的双重责任 幸福感是双倍的. Beijing Obstetrics and Gynecology Hospital website. 2023 Sep 26. Available from: https://www.bjogh.com.cn/xwzx/article/26908.html

阎锡蕴 Yan Xiyun

Yan Xiyun, a renowned Chinese biophysicist and academician of the Chinese Academy of Sciences, currently serves as a researcher at the Institute of Biophysics, Chinese Academy of Sciences (CAS).

The photo of Yan Xiyun

Yan Xiyun, a distinguished biophysicist and academician of the Chinese Academy of Sciences, is renowned for pioneering the concept of "nanozymes," opening a new field in nanotechnology and biomedicine. Yet behind her groundbreaking achievements lies a path marked by daunting challenges and resilience. [1]

In 1989, Yan embarked on her doctoral studies at Heidelberg University in Germany, leaving behind her two-year-old daughter. The initial period abroad was filled with loneliness and hardship. She struggled with language barriers, cultural differences, and a lack of foundational knowledge in her new field. To survive academically, she devoted herself to relentless study, often working late into the night. Through persistence, she became the first visiting scholar in her program to earn a doctorate, transforming vulnerability into strength. [2]

Earlier in her career, Yan had faced a difficult academic transition. In 1983, she moved from clinical medicine into basic research at the Institute of Biophysics, Chinese Academy of Sciences. This shift meant abandoning familiar ground and starting anew, performing basic laboratory work and rebuilding her expertise from scratch. She later recalled that each "reset" came with immense pressure, but it also carried the promise of fresh opportunity. [2]

Balancing family and career was another recurring challenge. During her years abroad, Yan endured long separations from her family, carrying the weight of guilt for the sacrifices they made. She once admitted that the thought of "not letting down her family's sacrifices" became her driving force. These emotional struggles added a layer of difficulty that many male scientists of her era rarely encountered.[2]

Despite the obstacles, Yan's determination bore fruit. In 2007, her team published a landmark paper in Nature Nanotechnology, proving that inorganic nanoparticles could act like enzymes. This discovery overturned the long-held belief that inorganic materials were inert, and it revolutionized applications in disease detection and treatment. Her success, however, was not immediate. In the early stages, the unconventional nature of her ideas drew skepticism, and she had to persist in defending and proving her concept before it gained recognition. [1]

Yan Xiyun’ s story illustrates how scientific breakthroughs are often forged in the crucible of adversity. Her perseverance in overcoming intellectual, personal, and institutional challenges exemplifies the resilience of women scientists in modern China. Today, her achievements stand not only as scientific milestones but also as a testament to the power of determination in the face of hardship.

Reference list:

[1] 阎锡蕴. 中国科学院院士阎锡蕴:从纳米的世界探寻酶的奥秘 [EB/OL]. 澎湃新闻·澎湃号·政务, 2022-02-07. [Yan Xiyun. Yan Xiyun, Academician of the Chinese Academy of Sciences: Exploring the Mysteries of Enzymes from the Nano World [EB/OL]. The Paper, The Paper, Government Affairs, 2022-02-07.] Available from: https://www.thepaper.cn/newsDetail_forward_16596914

[2] 中国科学院. 爱科学、爱生活、爱美丽——阎锡蕴院士的"三热爱" [EB/OL]. 中国科学院官网, 2019-03-07. [Chinese Academy of Sciences. Love Science, Love Life, Love Beauty-Academician Yan Xiyun's "Three Loves" [EB/OL]. Official of the Chinese Academy of Sciences Net, 2019-03-07.] Available from: https://www.cas.cn/xzfc/201909/t20190926_4717989.shtml

陈化兰 Chen Hualan

An animal virologist and director of the National Avian Influenza Reference Laboratory, was awarded the 2016 UNESCO L'Oréal-UNESCO For Women in Science Award for her outstanding achievements.

The photo of Chen Hualan

Chen Hualan (born in 1969), holds a bachelor's degree in Veterinary Medicine from Gansu Agricultural University (1991), a master's degree (1994), and a doctorate from the Chinese Academy of Agricultural Sciences (1997). In 1999, she went to the US Centers for Disease Control and Prevention (CDC) for further studies. In 2003, she returned to China and established a research team. She led the development of the world's first H5/H7 bivalent avian influenza inactivated vaccine (2017) [1], discovered the key mutations that led to a mortality rate of over 50% for the H7N9 virus [2], halted the sixth wave of avian influenza in China (in the autumn of 2017), and achieved a zero interruption of human infection cases [1]. In 2013, she was named one of the "Top Ten Scientific Figures in the World" by Nature and was hailed as the "Influenza Detective" [2].

Chen Hualan faced significant gender-related challenges in her scientific career: As a mother, in 2003, she returned to China alone with her two-year-old son to establish a laboratory, while bearing the dual pressures of parenting and intense scientific research [3]; As a female scientist, she needed to overcome the implicit bias that "women in the veterinary field have difficulty leading national projects", and for many years, she has deeply engaged in the frontline of traditional male-dominated farms to carry out high-risk sampling work (53,000 samples per year) [1][2].

Facing difficulties, she innovatively transformed her gender traits into advantages:

Firstly, the responsibility of motherhood was elevated: She transformed her anxiety about parenting into a scientific mission of "protecting children from the threat of influenza", promoting the dissemination of child protection knowledge for farmers during the team's sampling [2];

Secondly, technical details were innovated: She utilized the meticulous nature of women to pioneer a double swab sampling method for the throat and cloaca, significantly improving the virus detection rate, and establishing a national monitoring network with 65% female members [1];

Finally, professional authority was expanded: After the vaccine successfully intercepted the epidemic

in 2017, all her interviews focused on technological breakthroughs (such as the "zero growth" results [1]), using her identity as the "core engine for national avian influenza prevention and control" to completely reshape public perception, and practicing her professional philosophy of "If technology is what the country needs, why don't I come back?" [3].

Reference list:

[1] This article is a comprehensive report. Chen Hualan: Using Technology to "Subdue" Avian Influenza [J]. Invention and Innovation (Big Technology), 2018, (11): 20-21.

[2] Kan Chunyu. Chen Hualan: The "Influenza Detective" Fighting Against the Virus [J]. China Committee for Political Consultation, 2020, (21): 70-71.

[3] Zhi Yi. Chen Hualan: The "Influenza Detective" [J]. China Rural Science and Technology, 2017,(12): 57-59.

施蕴渝 **Shi Yunyu**

Biophysicist, academician of the Chinese Academy of Sciences, professor at the University of Science and Technology of China, and the founder of the research on nuclear magnetic resonance of biological macromolecules in China.

The photo of Shi Yunyu

Shi Yunyu (born in 1942), holds a bachelor's degree in Biophysics from the University of Science and Technology of China (1965). During her two successive overseas studies in Italy in the 1980s, she overcame the "three deficiencies" (lack of instruments, equipment, and funds) [1]. After returning to China, she started from scratch and established the first domestic experimental system for nuclear magnetic resonance of biological macromolecules. She pioneered the realization of protein molecular dynamics simulation (in the 1980s) and was the first to resolve the high-resolution solution structures of transcription factors and scorpion venom proteins (in the 1990s) [2]. Simultaneously, she devoted herself to the field of education, establishing the first teaching system for structural biology and computational biology at the University of Science and Technology of China, cultivating a large number of interdisciplinary leaders. Her decades-long dedication to teaching undergraduate courses has earned her the affectionate nickname "Grandma Shi" [1].

Shi Yunyu's scientific career was always intertwined with the unique challenges faced by female scientists:

During her official assignment to Italy in the 1980s, she encountered severe cross-border economic pressure - a meager 100 yuan per month as pocket money (she had to be meticulous in her spending and even gave up ice cream consumption), yet she had to squeeze out funds from her meager savings to purchase core research equipment to return to China [1]; Under the difficult conditions of "no instruments, equipment, or funds" at the University of Science and Technology of China [3], she frequently took a 12-hour train ride to Shanghai to consult literature, stayed up late for 863 project application writing, and also had to overcome the disciplinary bias that "women's physical strength is insufficient for operating heavy equipment";

Facing these structural challenges, she innovatively transformed limitations into advantages: By using the remaining funds to purchase parts and assemble the first batch of experimental equipment, she transformed personal needs into a shared research foundation for the team, achieving the transformation

from economic weakness to resource integration [1]; By leading protein computational simulation research to open up a new path in biophysics, using theoretical innovation to break through physical limitations, and achieving the leap from physical preconceptions to disciplinary leadership [3].

The philosophical thought throughout her scientific career that "the joy of climbing lies in the climbing process" [2] ultimately guided her to build the first domestic nuclear magnetic resonance experimental system in resource-poor conditions, achieving a dominant position in the discourse of interdisciplinary fields from the unique perspective of a female scientist.

Reference list:

[1] Zhou Wenting. Cultivating the Spirit of Devoting to Science and Education for the Country [J]. Science Enlightenment, 2020, (08): 28-29.

[2] You Yi. Shi Yunyu: Diligently Exploring the Secrets of Biological Macromolecules [J]. Science Friends, 2022, (11): 40-41.

[3] Xiong Weimin, Yao Qin. Interview with Academician Shi Yunyu from the Department of Biophysics to the College of Life Sciences [J]. Science Culture Review, 2018, 15(04): 71-92.

柳红 Liu Hong

Liu Hong, a distinguished Chinese pharmacologist and researcher, currently serves as a senior investigator at the Shanghai Institute of Materia Medica, Chinese Academy of Sciences (CAS).

The photo of Liu Hong

Liu Hong, a prominent researcher at the Shanghai Institute of Materia Medica, has made significant contributions to drug discovery and development. [1] However, her career has been marked by numerous challenges, both scientific and personal, that she has overcome through persistence and innovation.

One of the major difficulties Liu faced was the long and uncertain drug development process. The journey from lab research to clinical trials can span over a decade, and many drug candidates face setbacks along the way. In one notable instance, Liu's team developed an HIV drug candidate, Maraviroc, which initially showed promise. However, they discovered that it inhibited human metabolism enzymes, posing potential toxic risks. Instead of abandoning the project, Liu's team persevered, refining the compound and eventually developing Selzentry, which overcame the toxicity issues and entered clinical use. [2]

In addition to scientific hurdles, Liu also encountered the immense pressure and emotional toll that comes with drug discovery. The process is fraught with failures, and the constant need to adapt to new challenges can be exhausting. One such challenge arose during the 2003 SARS outbreak when Liu's team had to rapidly shift focus to antiviral drug development. Despite the urgency, the timeline for creating effective drugs was extremely tight, requiring swift problem-solving and adaptation. [3]

The COVID-19 pandemic in 2020 presented another formidable challenge. Liu's team quickly pivoted to addressing this global health crisis, developing a novel antiviral drug candidate, FB2001. Despite the pressure, they succeeded in advancing the drug to clinical trials, demonstrating Liu's ability to lead her team through yet another complex problem. [4]

Moreover, Liu faced the constant difficulty of working in a male-dominated field, where her achievements often went unnoticed. The competitive nature of scientific research meant that Liu had to work harder to prove herself and gain recognition, particularly as a woman in science. Despite these

obstacles, she has become a leading figure in drug discovery, particularly in the fields of infectious diseases, cancer, and metabolic disorders.

Through it all, Liu Hong's resilience and commitment to science have been key to her success. Her ability to overcome setbacks and lead her team through difficult challenges continues to inspire future generations of scientists.

Reference list:

[1] Wang C, Qu G, Chen Y. Novel coronavirus pneumonia prevention and control: the power of chemistry. Sci Bull. 2020;10.1360/TB-2020-0600.

[2] Liu H. Shanghai Institute of Materia Medica, Chinese Academy of Sciences [Internet]. [cited 2025 May 18]. Available from: https://www.cas.cn/xzfc/202505/t20250515_5068345.shtml

[3] Jiang Q, Sun M. 执着自强铸新药 融合创新为民生 [Persistently self-improvement to create new drugs and integrate innovation for the sake of life] [Internet]. 中国科学报. 2025 May 13 [cited 2025 May 18]. Available from: https://www.cas.cn/ky/kyjz/201003/t20100301_2785412.shtml

[4] Shanghai Institute of Materia Medica, Chinese Academy of Sciences. 上海药物所抗禽流感药物扎那米韦获得新药证书和药品批准文号 [The anti-avian influenza drug Zanami of the Shanghai Institute of Pharmaceuticals obtained the new drug certificate and drug approval number] [Internet]. 2010 Mar 1 [cited 2025 May 18]. Available from: https://www.nsfc.gov.cn/Portals/0/fj/hx/637511362385487500890934 8.pdf