Cambridge University - Nanjing
Centre of Technology and Innovation
剑桥大学南京科技创新中心

NEWS LETTER

半年报

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Jul-Dec 2024 / No.13

中心举办**“剑桥南京讲坛2024——生物医疗创新与合作”**
CUNJC Held the “Cambridge Nanjing Forum 2024 - Biomedical Innovation and Collaboration”

中心荣获**“2024年科技型中小企业”**
CUNJC was included in the list of “2024 Technology-Based Small and Medium-Sized Enterprises”

中心项目在**国际高水平期刊发表多篇科研成果**
CUNJC Published Several Papers in International Top Journals

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卷首语
PREFACE

Adhering to the goal of accelerating the commercialisation of scientific research and emphasising the promotion of international scientific collaboration and industrial innovation, the Cambridge University - Nanjing Centre of Technology and Innovation achieved comprehensive development in the second half of 2024 in areas such as research projects, external activities and exchanges, and commercialisation exploration. Research projects progressed smoothly, with project teams attracting outstanding talents based on research and commercialisation needs, producing diverse outcomes such as academic papers and reports, while simultaneously carrying out commercialisation explorations that achieved substantive progress. In response to Nanjing's strategic focus on fostering and expanding an innovative biopharmaceutical cluster, CUNJC fully leveraged the University of Cambridge's disciplinary advantages in biomedicine and healthcare to successfully host the Cambridge Nanjing Forum 2024: Biomedical Innovation and Collaboration. To support Cambridge's development needs, CUNJC co-organised the "Applying to Cambridge: Admission Event for 2025 Postgraduate Study" in collaboration with the Cambridge Admissions Office, building a bridge between domestic students and the University of Cambridge. Platform was further consolidated as CUNJC was listed in China's "Technology-Based Small and Medium-Sized Enterprises" in the fourth consecutive year, was shortlisted for the 2024 British Business Awards – Business Partnership Award, and successfully passed the acceptance inspection for Jiangsu Provincial International Cooperation Project—Establishment of Professional Agency for International Technology Transfer.

CUNJC Held the "Cambridge Nanjing Forum 2024 - Biomedical Innovation and Collaboration"

On 2nd December, the "Cambridge Nanjing Forum 2024 - Biomedical Innovation and Collaboration" was successfully held in Nanjing. The event was hosted by the Cambridge University - Nanjing Centre of Technology Innovation, with support from the Foreign Affairs Office of Jiangsu Provincial People's Government.

Renowned scholars from leading Chinese universities, including Fudan University, Nanjing University, Southeast University, Sun Yat-sen University, China Medical University, and Soochow University, as well as top professors from overseas universities such as the University of Cambridge, gathered alongside medical professionals from local clinical institutions like Nanjing Brain Hospital. Together, they engaged in lively and insightful discussions on such issues as obesity-associated metabolic complications, brain science & geriatric disease research and the bioengineering application of photoacoustic microscopy. The forum provided a platform to explore cutting-edge application-oriented technological advances and innovative practices in the fields of biomedicine and healthcare services.

Attendees of the opening ceremony included Yanfei Shen, Deputy Director General of the Foreign Affairs Office of Jiangsu Provincial People's Government; Wenbin Chen, Member of Nanjing Jiangbei New Area Party Working Committee and Deputy Director General of Nanjing Jiangbei New Area Management Committee; Jia Le, Director of Division of European Affairs, Department of International Cooperation, Ministry of Science and Technology of the People's Republic of China; Catherine Sinclair-Jones, Director East China of the British Council, and Consul (Culture and Education) of the British Consulate-General Shanghai; Daniel Brooker, Director for UK Research and Innovation China; and Daping Chu, Tenured Professor of the University of Cambridge, and the Academic Director and CEO of the CUNJC. More than 100 guests representing government, academia, industry, research, and investment sectors participated in the event on-site, while over 2,000 attendees joined virtually.

Converge the wisdom in biology, towards a healthy future. Aligned with local industrial needs and the research strengths of the University of Cambridge, CUNJC has established "biomedicine and healthcare" as a key focus since its establishment in 2018, embarking on a series of R&D initiatives. Aimed at building a communication bridge between research institutions and enterprises, the Centre seeks to deepen the exchange and integration of scientific and industrial innovation. It will continue to accelerate the pace of collaboration among industry, academia, research institutions, and application, to establish a high-level and open platform, and to shape the future of cooperation in the biomedical industry.

CUNJC was included in the list of "2024 Technology-Based Small and Medium-Sized Enterprises"

On 20 September, 2024, in accordance with the announcement issued by the Jiangsu Provincial Department of Science and Technology titled "Notice on the First Batch of Technology-Based Small and Medium-Sized Enterprises in Jiangsu Province for 2024", CUNJC was successfully included in the list.

江苏省科学技术厅

苏科高函〔2024〕347号

省科技厅关于江苏省2024年第一批入库科技型中小企业的公告

各有关单位：

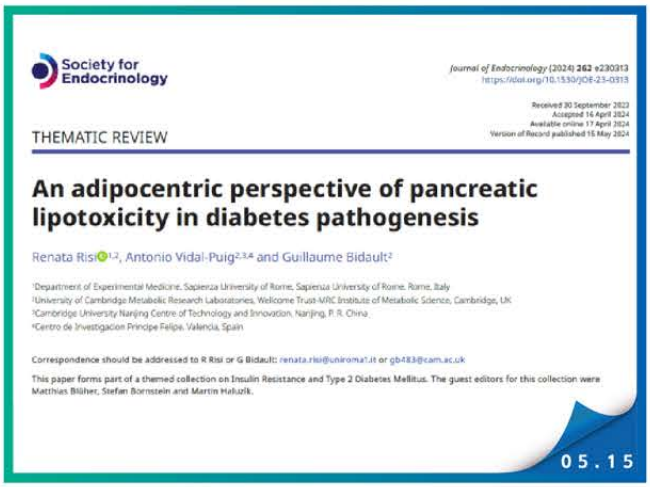
根据《科技型中小企业评价办法》（国科发政〔2017〕115号）和《科技型中小企业评价服务工作指引》（国科火字〔2022〕67号）要求，现将江苏省2024年第一批29046家入库科技型中小企业名单（详见附件）予以公告。

附件：江苏省2024年第一批入库科技型中小企业名单

09.20

CUNJC Published Several Papers in International Top Journals

On 15 May, 2024, Professor Antonio Vidal-Puig, PI of CUNJC's Project of "Obesity Associated Metabolic Complications: Pathogenic Mechanisms, Diagnostic Biomarkers and Therapeutic Targets" and Head of the Metabolic Research Centre at the University of Cambridge published a research paper titled "An adipocentric perspective of pancreatic lipotoxicity in diabetes pathogenesis" in the Journal of Endocrinology.



Society for Endocrinology

Journal of Endocrinology (2024) 262 e230313
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Accepted 16 April 2024
Available online 17 April 2024
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THEMATIC REVIEW

An adipocentric perspective of pancreatic lipotoxicity in diabetes pathogenesis

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[4]Centro de Investigacion Principe Felipe, Valencia, Spain

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This paper forms part of a themed collection on Insulin Resistance and Type 2 Diabetes Mellitus. The guest editors for this collection were Matthias Blüher, Stefan Bornstein and Martin Haluzík.

05.15

On 24 June, 2024, Professor Antonio Vidal-Puig published another research paper titled "Cystathionine γ-lyase-derived H2S negatively regulates thymic egress via allosteric inhibition of sphingosine-1-phosphate lyase" in the Acta Pharmacologica Sinica.

Acta Pharmacologica Sinica

www.nature.com/aps

ARTICLE

Cystathionine γ-lyase-derived H_2S negatively regulates thymic egress via allosteric inhibition of sphingosine-1-phosphate lyase

You-lian Hu[1,2], Zhi-wei Liu[2], Tong-hui Zhang[2], Yu-e Mo[2], Lei He[2], Jie Zhang[2], Yue-yang Zhou[2], Antonio Vidal-Puig[3,4,5], De-jing Pan[1,2] and Fang Wu[1,2]

Thymic egress is a crucial process for thymocyte maturation, strictly regulated by sphingosine-1-phosphate lyase (S1PL). Recently, cystathionine γ-lyase (CSE), one of the enzymes producing hydrogen sulfide (H_2S), has emerged as a vital immune process regulator. However, the molecular connection between CSE, H_2S and thymic egress remains largely unexplored. In this study, we investigated the regulatory function of CSE in the thymic egress of immune cells. We showed that genetic knockout of CSE or pharmacological inhibition by CSE enzyme inhibitor NSC4056 or DL-propargylglycine (PAG) significantly enhanced the migration of mature lymphocytes and monocytes from the thymus to the peripheral blood, and this redistribution effect could be reversed by treatment with NaHS, an exogenous donor of H_2S. In addition, the CSE-generated H_2S significantly increased the levels of S1P in the peripheral blood, thymus and spleen of mice, suppressed the production of proinflammatory cytokines and rescued pathogen-induced sepsis in cells and in vivo. Notably, H_2S or polysulfide inhibited S1PL activity in cells and an in vitro purified enzyme assay. We found that this inhibition relied on a newly identified $C^{244}XC^{246}$ redox motif adjacent to the enzyme's active site, shedding light on the biochemical mechanism of S1PL regulation. In conclusion, this study uncovers a new function and mechanism for CSE-derived H_2S in thymic egress and provides a potential drug target for treating S1P-related immune diseases.

Keywords: immune cells; thymic egress; hydrogen sulfide; S1P lyase; redox motif; NSC4056

Acta Pharmacologica Sinica (2024) 0:1–14; https://doi.org/10.1038/s41401-024-01322-8

06.24

On 17 September, 2024, Professor Antonio Vidal-Puig published a research paper titled "Breaking barriers in obesity research: 3D models of dysfunctional adipose tissue" in the Trends in Biotechnology.

TIBTEC 2568 No. of Pages 15 ARTICLE IN PRESS

Trends in Biotechnology

CellPress

Review

Breaking barriers in obesity research: 3D models of dysfunctional adipose tissue

Nicola Contessi Negrini [1,2,7,*,@], Vanessa Pellegrinelli [3,7,*,@], Victoria Salem [1], Adam Celiz [1,2], and Antonio Vidal-Puig [3,4,5,6]

09.17

On 1 October, 2024, Professor Daping Chu, PI of CUNJC's Project of "Multi-modality and Hybrid 3D Ultrasound/Photoacoustic Imaging System" published a research paper titled "Anti-interference photoacoustic microscopy with adaptive noise cancellation and echo recovery for in vivo ocular imaging" in the PHYSICAL REVIEW APPLIED.

PHYSICAL REVIEW APPLIED **22,** 044002 (2024)

Anti-interference photoacoustic microscopy with adaptive noise cancellation and echo recovery for *in vivo* ocular imaging

Dongfang Li,[1] Yue Yao,[1] Zilong Zou,[1] Tianxiang Zuo,[1] Chao Tao,[1,*] Xiaojun Liu,[1] and Daping Chu[2,3]

[1] *MOE Key Laboratory of Modern Acoustics, Department of Physics, Nanjing University, Nanjing, 210093, China*

[2] *Centre for Photonic Devices and Sensors, Department of Engineering, University of Cambridge, 9 JJ Thomson Avenue, Cambridge CB3 0FA, UK*

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10.01

科研与产业化
RESEARCH AND COMMERCIALISATION

CUNJC's Project Teams Delivered Multiple Academic Presentations

On 19 July, 2024, the liquid crystal metasurface spectroscopic chip developed under the CUNJC's project of "Holographic Interferometer for 3D Surface" was showcased in the "Application of Single-pixel Imaging Systems" organised by the Optical Society of America. Jiewen Nie, intern assistant researcher of CUNJC, was invited to participate and deliver a presentation titled "Computational Hyperspectral Single-pixel Camera based on Liquid Crystal Metasurface."

From 20 to 23 September, 2024, Professor Antonio Vidal-Puig, PI of CUNJC's Project of "Obesity Associated Metabolic Complications: Pathogenic Mechanisms, Diagnostic Biomarkers and Therapeutic Targets" and Head of the Metabolic Research Centre at the University of Cambridge, was invited to attend the "2024 International Conference on the Comprehensive Life Course Prevention and Treatment of Obesity and Related Chronic Diseases" hosted by China Medical University, engaging in in-depth discussions on relevant topics.

On 4 December, 2024, Professor Antonio Vidal-Puig was invited by the Suzhou Institute of Biomedical Engineering and Technology, Chinese Academy of Sciences, to deliver a lecture titled "Adipose Tissue Expandability, Lipotoxicity, and Metabolic Syndrome" at the BMEF Keling Academic Forum.

From 13 to 15 December, 2024, Professor Antonio Vidal-Puig attended the 2nd Annual Conference of the State Key Laboratory of New Targets Discovery and Drug Development for Major Diseases and the 2024 China Biomedical Development Conference, hosted by the Gannan Innovation and Translational Medicine Research Institute. During the event, he discussed on the latest research advancements and technological breakthroughs in biomedicine and was appointed as a council member of the International Society of Innovative and Translational Medicine (ISITM).

CUNJC Submitted Three New Invention Patent Applications in China and One Invention Patent Application in US

CUNJC submitted three new invention patent applications in China. These include one joint application with Nanjing University for the project of "Obesity Associated Metabolic Complications: Pathogenic Mechanisms, Diagnostic Biomarkers and Therapeutic Targets" and two for the project of "DropBioApp Engineering Droplet-based Microfluidic Platform for Biological Applications". To date, CUNJC has obtained seven domestic invention patents granted, with another five in application.

Additionally, following the completion of a PCT international patent application in 2022, a new patent application for "A methodology and device for spectra establishment" under the project of "Holographic Interferometer for 3D Surface" was filed with the United States Patent and Trademark Office (USPTO) on 27 December , 2024, under application number US18/879,444.

uspto UNITED STATES PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
18/879,444	**12/27/2024 01:27:19 PM Z ET**	**C2725.10558US01**

Title of Invention

METHOD AND DEVICE FOR ESTABLISHING SPECTRUM

Application Information

APPLICATION TYPE	Utility - U.S. National Stage under 35 USC 371	PATENT #	-
CONFIRMATION #	3850	FILED BY	Greta Schneider
PATENT CENTER #	68533306	FILING DATE	-
CUSTOMER #	97149	FIRST NAMED INVENTOR	Lei TIAN
INTL. APPLICATION #	PCT/CN2022/124582	INTL. FILING DATE	10/11/2022
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Burns Israelsen

New Researchers Joined CUNJC

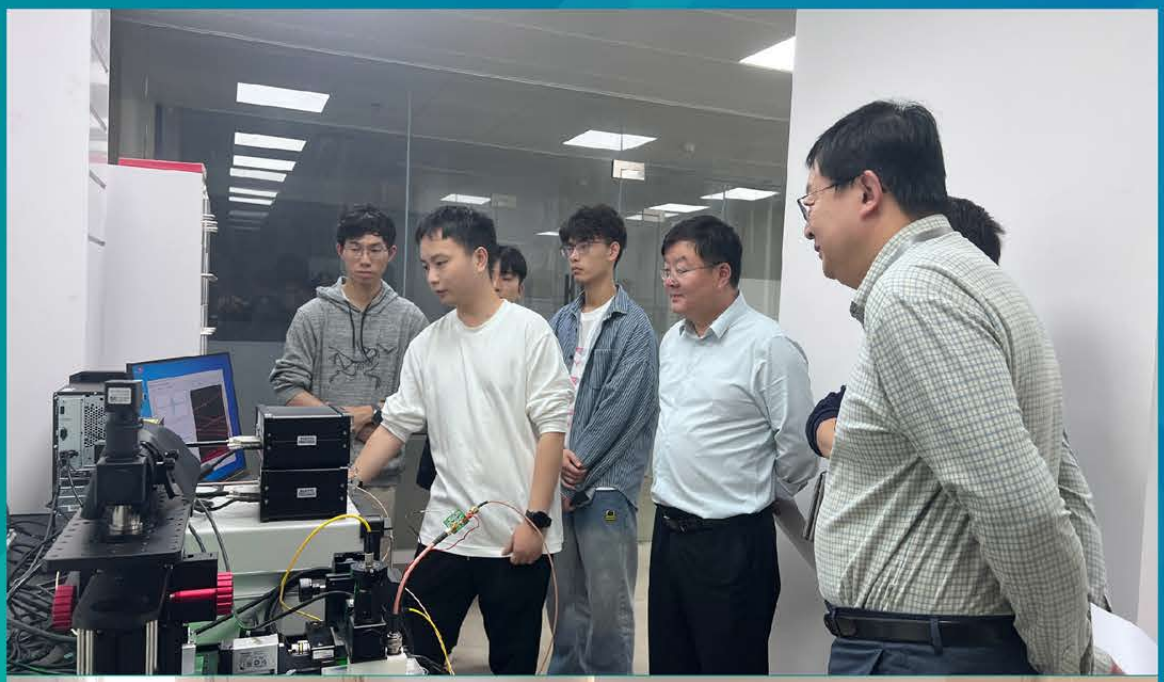
On 18 September, 2024, Dr. Weizhen Sun joined the project of "DropBioApp Engineering Droplet-based Microfluidic Platform for Biological Applications" as a researcher. Dr. Sun graduated from the University of Sheffield with a major in Chemical and Biological Engineering.

In November 2024, Tianxiang Zuo and Jiaye Xu joined the project of "Multi-modality and Hybrid 3D Ultrasound/Photoacoustic Imaging System" as intern researchers. Zuo is pursuing a Ph.D. in Acoustics at Nanjing University, while Xu is a Master's student in the same field at Nanjing University.

Key Milestones Achieved in Ongoing Projects

CUNJC's ongoing projects progressed smoothly, with some reaching key milestones and achieving expected goals. Close research collaborations were maintained with universities such as Nanjing University, Southeast University, Soochow University, and Nanjing Tech University.

Project of "Multi-modality and Hybrid 3D Ultrasound/Photoacoustic Imaging System" completed the design, development, and delivery of a prototype system for photoacoustic microscopy in collaboration with Nanjing University. It can be applied in medical experiments to observe pathological thin sections, ex vivo tissues, or live tissues. The project of "Holographic Interferometer for 3D Surface" successfully upgraded interferometer technology from point scanning to array scanning, significantly improving imaging speed and efficiency. Additionally, the computational spectroscopy chip derived from the project research work , innovatively proposes and validates a new spectral chip structure with high integration, high efficiency, low-cost, and high scalability by combining integrated optics and computational optics technologies, demonstrating the promising application in next-generation spectroscopic detection and imaging.



Jiangsu Provincial International Cooperation Project—Establishment of Professional Agency for International Technology Transfer Passed the Acceptance Inspection

On 3 December, 2024, the Science and Innovation and Intellectual Property Bureau of Nanjing High-Tech Zone Management Committee organised an acceptance review meeting for the project of " Establishment of Technology Transfer Service System and International Technology Transfer Service" undertaken by CUNJC. The project successfully passed the evaluation and marked the completion.

江苏省科技计划项目验收证书

苏科验字［2024］第 2116 号

计划类别：政策引导类计划（国际科技合作/港澳台科技合作）--国际技术转移服务机构建设项目

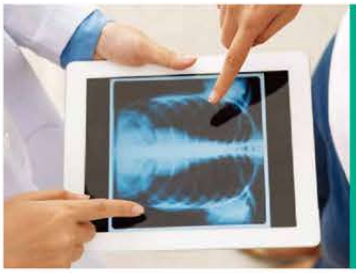
项目编号：BZ2021066

项目名称：剑桥大学南京科技创新中心技术转移服务体系建设及国际技术转移服务

承担单位：剑桥大学南京科技创新中心有限公司

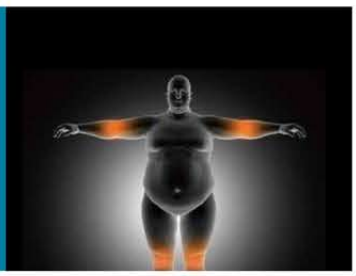
Commercialisation of Research Projects in Steady Progress

CUNJC actively explores commercial applications of research results with a forward-looking approach driven by technology and market demand. Based on staged research achievements, CUNJC seeks to explore the paths to commercialise the outcomes, and try to promote the application in industrial chains and specific scenarios. The commercialisation attempts for ongoing projects is progressing steadily.



CUNJC supports project teams in forming the team for commercialistaion exploration. The "Multi-modality and Hybrid 3D Ultrasound/Photoacoustic Imaging System" project has recruited two graduate students from Nanjing University as intern researchers to explore the commercial application of photoacoustic microscopy.

The "Obesity Associated Metabolic Complications: Pathogenic Mechanisms, Diagnostic Biomarkers and Therapeutic Targets" project, jointly working with a research team from Nanjing University, has designated a Master's student to focus on the scientific research and commercialisation of transfection reagent.



Meanwhile, the "DropBioApp Engineering Droplet-based Microfluidic Platform for Biological Applications" project has brought on board a Ph.D. researcher, with CUNJC supporting the application-oriented R&D on nanomedicine and early cancer diagnostics.

Additionally, CUNJC actively explores suitable models for the commercialisation of project outcomes and put into practice.

The "High Power Density 48V DC Converter Power System for Data Centres" project has generated revenue through intellectual property licensing of technological achievements.

For the "Holographic Interferometer for 3D Surface" project, CUNJC plans to establish a startup company with the project team to further develop and commercialise products using miniaturised spectroscopy technology . The proposal to establish a startup is currently undergoing an internal approval process within CUNJC.

Thriving Resident Enterprises in CUNJC

With a focus on technological innovation, CUNJC has established an adaptive ecosystem for innovation and transformation, becoming a cradle for startups. In 2024, resident enterprises achieved remarkable progress.

Nanjing ReaVis Technology Co., Ltd. expanded quickly, with a strategic agreement signed with Nippon Seiki and further securing the collaboration with Xiaomi. Founder Deng Yuanbo was listed on the "Pioneers in Science & Innovation" in August and the "2024 Forbes China 100 Young Returnee Elites" in December.

Nanjing EPIC Technology Co., Ltd., developed multiple products surrounding the power solution for data centress.

Nanjing Yu Dashan New Energy Technology Co., Ltd. preliminary completed the design of several core algorithm models for optimising V2G charging and discharging processes, and achieved phased results in validation.

Nanjing Fuheng New Energy Technology Co., Ltd. established partnerships with local clients, newly constructed several EV charging piles and the energy-saving project for architectures is expected to implement next year.

Nanjing Yuanmeng Technology and Culture Co., Ltd., built long-term collaborations with leading domestic research institutions and enterprises for customised scientific content.

Additionally, based on local industrial needs, CUNJC continues to introduce high-quality innovation resources, and is now negotiating with several technology startups and entrepreneurial projects in areas such as intelligent vehicles and digital healthcare.

CUNJC and Cambridge Admissions Office Successfully Held the "Applying to Cambridge: Admission Event for 2025 Postgraduate Study"

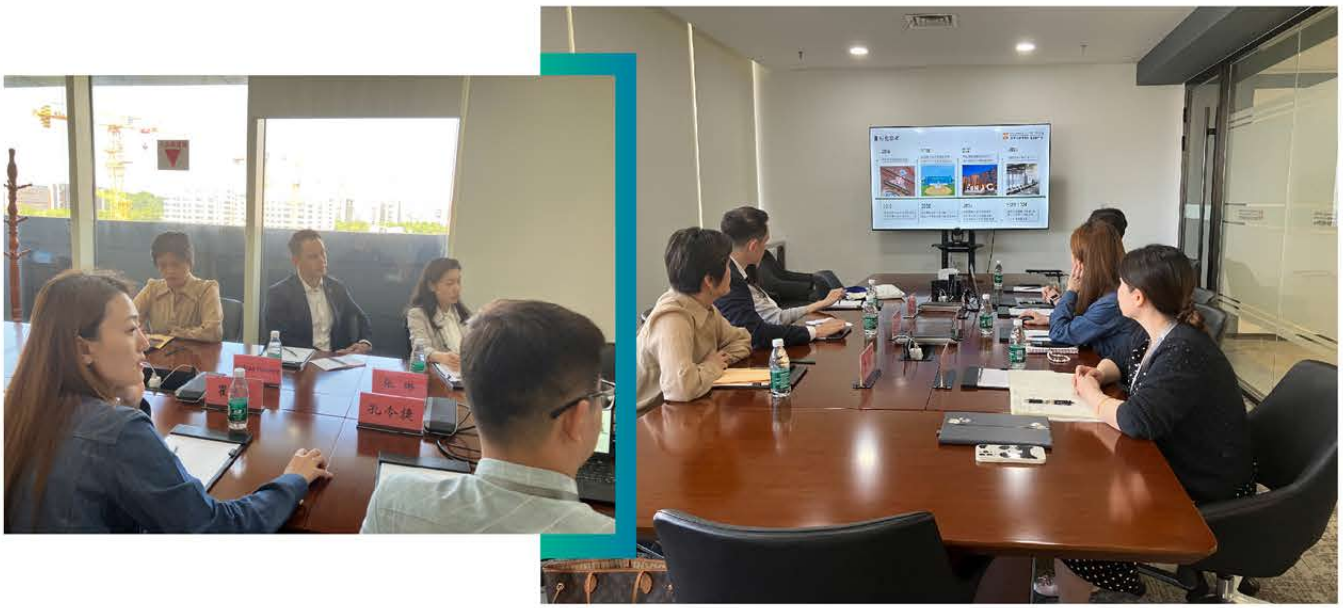
On 13 November,2024, the "Applying to Cambridge: Admission Event for 2025 Postgraduate Study" was successfully held in Nanjing in a hybrid online and face-to-face format. The event was jointly organised by the Cambridge Admissions Office, and the Nanjing Overseas Collaborative Innovation Centre (Cambridge, UK).

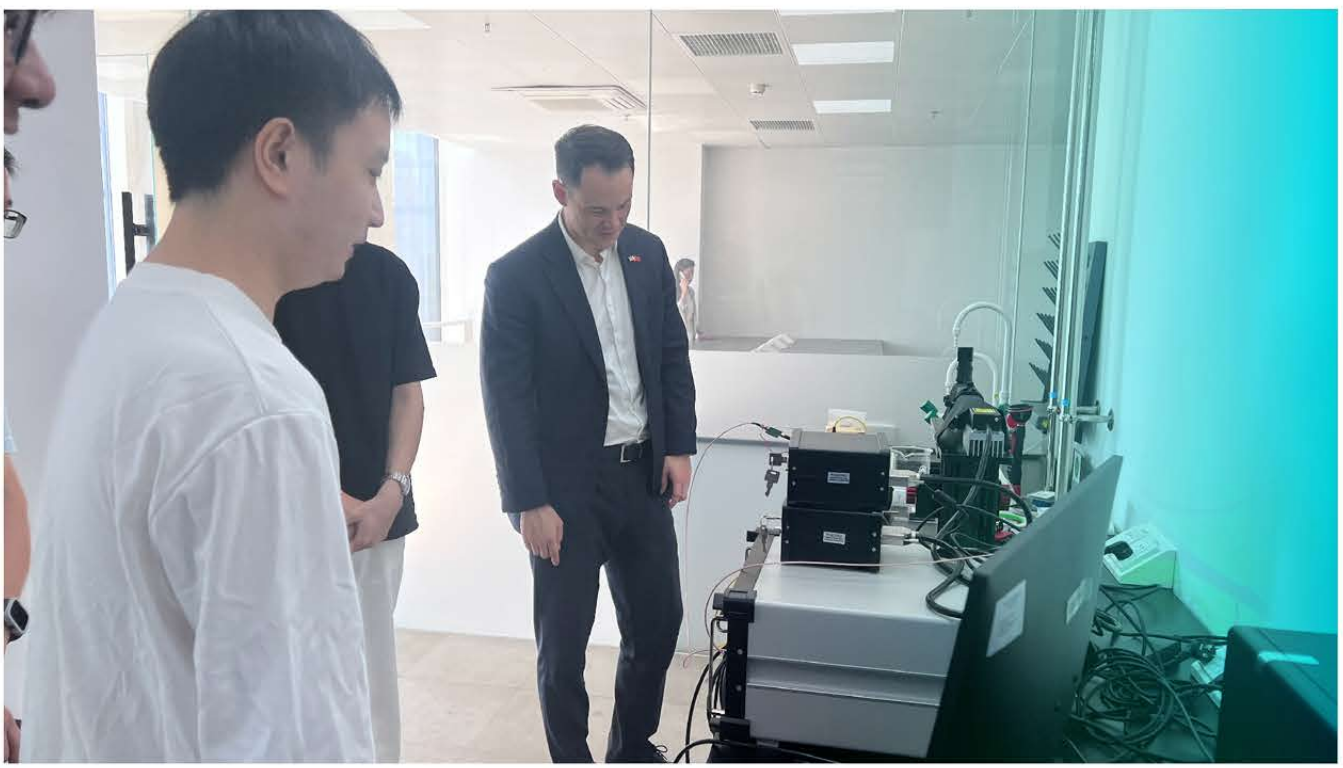
During the event, Dr. Luis Perez provided online guidance on application essentials, Prof. Daping Chu, tenured chair professor at the University of Cambridge and Academic Director and CEO of CUNJC, offered earnest advice to young students. Several Cambridge graduate alumni shared valuable study experiences and offered targeted suggestions to the attendees. The event not only attracted participants from top domestic universities such as Southeast University and Nanjing University of Aeronautics and Astronautics but also included well-known Sino-foreign joint universities like Xi'an Jiaotong-Liverpool University and the University of Nottingham Ningbo China. Additionally, the event was viewed online by over 1500 people, receiving a positive response.

The 2025 event can bridge vast distances, connecting domestic students with Cambridge for their academic pursuits. Since 2021, CUNJC collaborated multiple times with the Cambridge Admissions Office to host several "Applying to Cambridge" admission events for undergraduate and postgraduate, proactively playing a hub role in enhancing the connectivity between the University and domestic students. In the future, CUNJC will continue to support and assist the university's educational work, fostering youth innovation and promoting international talent exchange.

Visit Led by Joshua Howey, Regional Consul for East China (Jiangsu, Zhejiang, Anhui) at the British Consulate-General in Shanghai

On 24 September , Joshua Howey, Regional Consul for East China (Jiangsu, Zhejiang, Anhui) at the British Consulate-General in Shanghai, along with Jian Lu, Senior Officer for Jiangsu Affairs, visited CUNJC . They were accompanied by Zhang Lin, a 4th Class Consultant from the European and African Affairs Division of Foreign Affairs Office of Nanjing Municipal People's Government. CUNJC briefed on the latest progress in research and commercialisation of ongoing projects. Both parties also engaged in discussions on building an innovation ecosystem and exploring collaborative opportunities in business innovation.





CUNJC Shortlisted for the 2024 British Business Awards – Business Partnership Award

Organised by the British Chambers of Commerce across China, the British Business Awards serve to celebrate and promote excellence in innovation enterprise and endeavour in the British business community in China, as well as recognise the excellent accomplishments of Chinese businesses operating in the UK. The biennial awards have become an increasingly prestigious feature of the business calendar, and this year consists of nine categories. These awards showcase a number of organisations and individuals who have demonstrated a commitment to trade and investment in China.

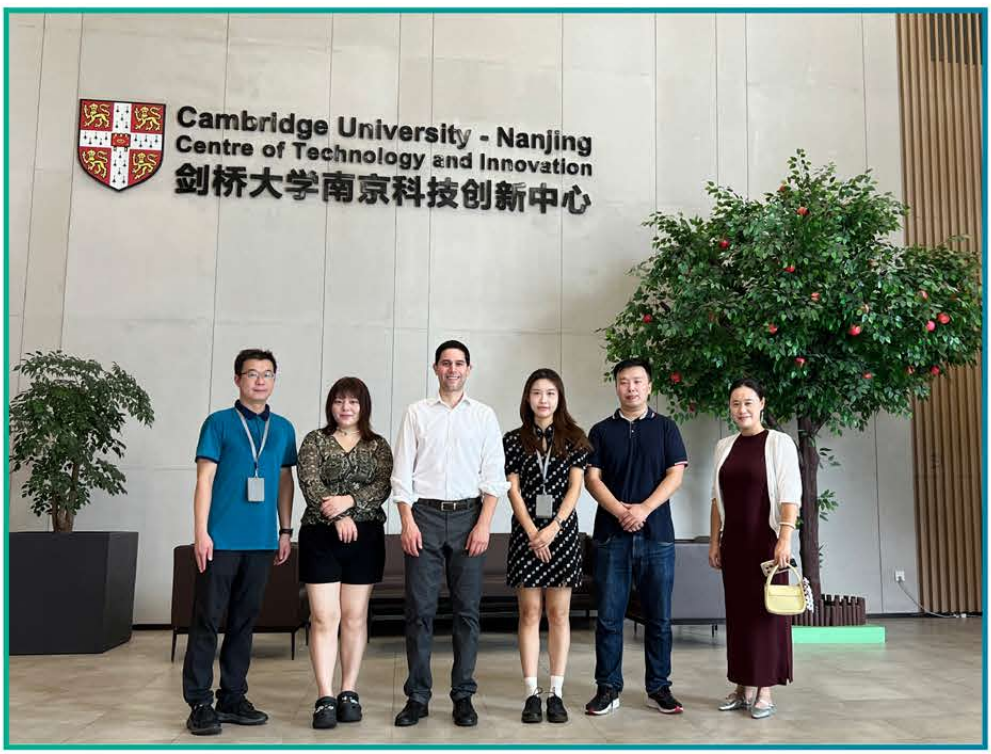
The Centre's success in being shortlisted for the Business Partnership Award highlights its remarkable achievements in promoting the deep integration of the University of Cambridge's cutting-edge research results with the Nanjing business market and other areas of business collaboration.

Increasing Industry-Research Exchanges in Life and Health Fields

Focusing on pharmaceutical innovation and healthcare services, CUNJC is driving the alignment and exchanges between local life and health industry needs and Cambridge's technological innovation resources, to explore new models and pathways for international collaboration. CUNJC conducted field visits and research at nearly ten leading enterprises in the medical industry, covering cutting-edge areas such as gene therapy, early cancer screening, and in vitro diagnostics. It also engaged in extensive exchanges with companies on technical challenges and collaboration opportunities, laying a solid foundation for precise alignment and effective discussions. Several discussions has been conducted with institutions and enterprises such as Nanjing Brain Hospital, Geneseeq, and Hanxin Pharmaceutical.

Visits from Multiple Domestic and Overseas Research and Investment Institutions

CUNJC actively engages with domestic and international stakeholders across government, academia, industry, and investment sectors, striving to integrate resources to advance scientific innovation and result transformation. Institutions such as Hangzhou Gongshu District Grand Canal Digital City and Hangzhou International Talents Entrepreneurship & Innovation Park, Henan Innovation Investment Group, and Research Center for Japanese Studies, Tsinghua University, along with several investment organisations from home and abroad, visited the CUNJC for exchange and learning. In-depth discussions were conducted on topics such as innovation support, research collaboration, and commercialisation resources.



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