Professor Xinghua (Victor) Pan, PhD, MD

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CURRENT RESEARCH INTERESTSIN IN BRIEF 當前研究方向

（1）單細胞組學技術創新和應用

Single cell technology innovation and application

（2）幹細胞與衰老和再生醫學

Stem cell and aging and regenerative medicine

（3）腫瘤異質性與精準醫學

Cancer heterogeneity and precision medicine

（4）組學生物資訊學

Bioinformatics for omics data

（5）中醫藥組學

Chinese medicine omics

CURRENT POSITION AND WORKING EXPERIENCES:

Professor Xinghua Pan, PhD, MD, Professor, Precision Regenerative Medicine Research Centre (PRMRC), Medical Science Division (MSD), and secondarily affiliated to State Key Laboratory of Quality Research in Chinese Medicine (SKL-QRCM), Macau University of Science and Technology (MUST), Macao 999078, China. He is a Supervisor for PhD candidate in Biomedical Science program in School of Medicine, MSD, MUST, and a Supervisor for Master candidate in Pharmacy in School of Pharmacy, MSD, MUST.

Prior to this from 2017-2024, Dr. Pan served as the Chairman and a Professor of Department Biochemistry and Molecular Biology, Southern Medical University (SMU), in Guangzhou, China, wherein he was the founding Director of Guangdong Provincial Key Laboratory of Single Cell Technology and Application, currently Vice Chairman of its Academic Committee, and an adjunct Professor there. He was a Principle Investigator of an open fund grant of Shenzhen Bay Laboratory, and invited as an adjunct Professor at Hangzhou Cancer Hospital, Sichuan University, Guangdong Pharmaceutical University, and Jiujiang University. He has been an Adjunct Professor of Nanfang Hospital, Zhujiang Hospital, Guangdong Provincial People's Hospital, and Dongguan Maternal and Child Health Hospital. He has also been an adjunct PI of the Key Laboratory of Infectious Disease Prevention and

Control of the Ministry of Education in South China, and of the Key Laboratory of Mental Health Research of the Ministry of Education, in SMU.

From 2004 to 2017, he entered as an Associate Research Scientist serving at Department of Genetics of Yale University School of Medicine, USA, then promoted to be a Research Scientist (PI) by Yale School of Medicine, while as a member of Yale Center Excellence in Genomics, Cancer Center, and Stem Cell Center.

From 2000 to 2004, he was employed as a Research Scientist and Enzymology Director at the Genomics Section of Molecular Staging Inc. (later acquired by Qiagen) in USA, meanwhile working as a Visiting Researcher at Yale University.

From 1994 year end to 1997, he was employed as an Associate Professor of Cell Biology and Medical Genetics at the Department of Biology in the Navy Medical University, Shanghai, China.

EDUCATIONS AND TRAINING EXPERIENCES

Dr. Pan got his Bachelor of medicine (MD equivalent) and MS of medicine at Southern Medical University (1980-1988, Guangzhou), PhD in genetics at Fudan University (1989-1993, Shanghai) with supervisors Dr. CC Tan (an Academician of CAS and NAS USA). He got 2 terms of postdoc training: the 1st was in molecular oncology at the State Key Laboratory of Molecular Oncology of the Cancer Hospital of Chinese Academy of Medical Sciences and Peking Union Medical College (CAMS & PUMC, 1993-1994, Beijing) with Dr. Min Wu (an Academician of CAS), and the 2nd was in genomics at Yale University School of Medicine (1997-1999, USA) with Dr. Sherman M. Weissman (an Academician of NAS USA, and Yale Sterling Professor) on the Molecular Oncology and Development Program of Boyer Center for Molecular Medicine at Yale.

During this period, Dr. Pan Pan also got short time training, particularly on Drosophila cytogenetics in Peking University Department of Biology; on molecular oncology in Melbourne University and Ludwig Cancer Institute, Australia, supported by International Union Against Cancer (UICC); and on artificial yeast chromosome in Cold Spring Harbor Laboratory (CSHL, New York) supported by CSHL.

In return, Dr. Pan since then has personally trained over 60 postdoctors, visiting scholars, and PhD, MS and BS candidates, and given lectures (biochemistry and molecular biology, medical genetics, cell biology) for near 10,000 undergraduate BS and postgraduate (and MD equivalent) students.

RESEARCH INTERESTS AND ACHIEVEMENTS:

Technological Explorations:

On the background of medicine, genetics and oncology, Dr. Pan started his technological exploration on single cell sequencing in early 2000s as a member of

international ENCODE consortium, developing a dozen of novel technologies for single cell analysis, including genomics (whole genome amplification WPA, medium-throughput scCNV-seq, and contributed to development REPLIg), epigenomics (2 methods for DNA methylome sequencing: scCGI-seq and msRRBS, and a method for closed chromatin profiling), transcriptomics (PMA, SMA and MUST-seq), telomere length measurement (SCT-pqPCR, USC-STELA), Single cell dual-multiplexing sequencing (NAMUL-seq) , and paved single-cell multiomics (the 1st approach for single cell analysis of RNA+DNA). Currently Dr. Pan continues the exploration of the methods msCNVS and msRRBS for single cell detection of genomic and epigenomic variation/alternation in clinics for embryos (PGT, NIPT) and cancers (cancer liquid biopsy, circulating cancer cells/CTC/MRD), and scaling up the throughput for research applications.

Basic Biomedical Researches:
Meanwhile, Dr. Pan mostly applies the cutting edge technologies in single cell omics, spatial omics, multiomics, bioinformatics and machine learning, combining with advanced cellular, molecular approaches, animal experiments, large clinical samples and public data to dissect the special mechanisms as well as the common intrinsic law for different physiological systems and disorders. Recent years his studies cover solid tumors (particularly liver fibrosis and liver cancer, and thyroid cancer, colorectal cancer, lung cancer, osteosarcoma), as well as leukemia MDS/AML and ALL for heterogeneity and evolution, stem/initiation cells and plasticity, cellular microenvironment, biomarker and precision medicine (diagnosis, treatment, drug response) models; stem cells and progenitor cells (particularly hematopoietic stem progenitor cells/HSC, mesenchymal stem cells/MSC), organoid, development, aging and regeneration; neuron and brain diseases; inflammatory bowel disease/IBD; and traditional Chinese medicine. He always enthusiastically seeks a collaboration with clinicians and scientists in variants of disciplines.

Summary of Publications and Innovations:
With a series of discoveries and innovations, Dr. Pan has contributed 160 publications cited in Google scholar, including in these journals: PNAS x7, Adv Science x4, Nucleic Acids Res x3, Nat Comm x3, Cell Mol Life Sci x3, Stem Cell Reports x3, Cancer Res x2, Cell Discovery x1, as well as coauthor in Cell x1 and Nature x4 papers, with a total impact factor >1000, and citations >8500. An ebook, Introduction to Single Cell Omics based on an associated research topic, led by Dr. Pan and published by Frontiers Medias in 2019, has been hit for more than 340 thousands, and downloaded for 50 thousands of time. He has contributed 15 invention patents issued in USA and China, with a few more patents pending. On some of his research achievements Dr. Pan was interviewed by Genetic Engineering & Biotechnology News (GEN, 2015), PNAS Club (2013) and Technology Networks (2018).

The studies conducted by Dr. Pan and his team were supported by Natural Science Foundation of China (NSFC youth fund) and China Postdoctoral Foundation (1990s

in China); National Institute of Health (NIH), Natural Science Foundation (NSF) and State of Connecticut (early in USA); and NSFC, China Minister of Science and Technology (MOST) , China Minister of Health/Education, Guangdong NSF, and Shenzhen Municipal foundation (recent years in China).

SCHOLASTIC SERVICES AND HONORS

Journal Reviewer and Editor:

Dr. Pan is a funding Associate Editor of Precision Clinical Medicine (by Oxford University Press) and Monocytomics (MCM), and currently the Executive Editor of the Special Issue on "Single Cell and Spatial Omics" of the Chinese Journal of Biochemistry and Molecular Biology, and an Editorial Board Member of the "Medical Molecular Cell Genetics Fundamentals" Core Textbook of the Ministry of Education 101 Plan.

He has been servicing as a reviewer or editorial board member for more than 30 internationally prestigious journals including Nature series such as Molecular Psychiatry, Nature Communications, Nature Protocols, Scientific Data and Science Reports; BMC series such as Molecular Cancer, BMC Genomics, BMC Biotechnology, BMC Medical Genetics; Frontiers series such as Frontiers in Cell and Developmental Biology, Frontiers in Genetics, Frontiers in Bioengineering and Biotechnology; journal on genomics and bioinformatics such as Genome Biology, Genome Medicine, Aging Cell, Protein and Cell, Giga Science, Gene, Genomics Proteomics and Bioinformatics, Journal of Genetics and Genomics, Current Bioinformatics, Computational and Structural Biotechnology; journals on cancer such as Cancer Communication, Cancer Letters, JNCC (J National Cancer Center), BBA Reviews on Cancer, Oncology Reports, Cancers; and others journals such as Science in China Life Sciences, Science Bulletin, Bone Research, Biology of Reproduction, Molecular Ecology Resource, Clinical and Translation Medicine, Intl J Mol Sci, Zoological Research, Hereditas (Beijing, in Chinese), Acta Academiae Medicinae Sinicae (in Chinese), Chinese Journal of Cell Biology (in Chinese), etc.

Grant Reviewer:

Dr. Pan also served or takes the role as a committee member or an invited reviewer for a number of research foundations such as the Medical Research Council (MRC, UK), Foundation against Cancer Belgium (i.e. Stichting tegen Kanker / Fondation contre le Cancer), NSFC, China MOST funds, Guangdong NSF, Chinese Academy of Sciences (CAS), and a few other local research foundations such as foundations of Zhejiang Province, Fujian Province, Guangxi Province, municipal foundations of Shenzhen, Guangzhou, Foshan, Dongguang, Nanjing, Zhongqin, Chengdu, Xi’an, etc.

Academic degree and professional title reviewer:

Dr. Pan is an invited expert for doctoral thesis review by the Degree and Graduate Education Development Center of the Ministry of Education, and he has been an committee member of invited reviewer for PhD degree defenses or professorship evaluation for dozens of universities such as Shanghai Jiaotong University, Tsinghua University, Sun Yat-sen University, South China University of Technology, South China University of Technology, Guangdong Medical University, and Guangzhou Medical University.

Conference organization and speeches:
Dr. Pan leads or co-organizes some national and international academic conferences, particularly recently as the initiator and a co-Chairman of the 1st to currently the 3rd International Conference on Single cell and Spatial Omics (TICSSO) held in 2022 to 2025 (Hangzhou/Guangzhou, Shenzhen, and Shanghai to come), and the Chairman of the Forum of Single Cell Elite (FOSCE) for the session number 1 to 10 held in 2021 to 2023. In addition, he has given invited speech on over 100 prestigious academic meetings in the past 20 years.

Scholastic organization leadership:
Dr. Pan currently is a Vice Chairman of Guangdong Biochemical and Molecular Biology Society of Chinese Society of Biochemistry and Molecular Biology (CSBMB), a member of CSBMB Basic Medical Professional Committee, a member of the Biomedical Professional Committee of the All-China Federation of Overseas Chinese, an Executive Committee member of the Guangdong Medical Genetics Society, an Executive Committee member of the Genetics and Reproduction Committee of the Cross Strait Medical and Health Exchange Association. He is also a member of the Academic Committee of the Key Laboratory of Precision Medicine in Sichuan Province, and the Chief Advisory of the Academic Committee (former Committee Chairman) of the Jiangxi Provincial Key Laboratory of Systemic Biomedical Sciences.

He was elected as the President, then the Chairman of Board of Governor, and the Chairman of Board consecutively of the 26th to 28th committee consecutively from 2018 to 2020, and again the Chairman of Board of the 32nd committee in 2024 of Chinese Association of Science and Technology in USA. He was invited as a member of the International Advisory Committee for Advances in NGS in India.

He was invited as an Expert of Hangzhou Cancer Hospital, an Researcher of Jinan University (Guangzhou), a Guest Professor of Sichuan University, and of Guangdong Pharmaceutical University. He was granted as Nanjing Leading Talent, Guangzhou High Level Talent, and Ganpo Talent- Distinguished Professor of Jiangxi Province. He once was granted UICC (International Union Against Cancer) Scholarship, CSHL (Cold Spring Harbor Laboratory) Scholarship, PolyGenomics Fellowship, international science organization VEBLEO Fellow, and CastUSA Single Cell Genomics Pioneer Award.

SELECTED RECENT PUBLICATIONS 部分近期著作

（*通訊作者, IF 為最高影響因數）

1. Su H, Zhou X, Lin G, Luo C, Meng W, Lv C, Chen Y, Wen Z, Li X, Wu Y, Xiao C, Yang J, Lu J, Luo X, Hong X, Chen Y, Paul KH Tam*, Li C*, Sun H*, **Pan X***. Deciphering the Oncogenic Landscape of Hepatocytes through Integrated Single-Nucleus and Bulk RNA-Seq of Hepatocellular Carcinoma. **Advanced Science** (Weinh), doi:10.1002/ADVS.202412944, accepted (2025). **(IF 15.1)**

2. Huang Y, Wang Q, Zhou W, Jiang Y, He K, Huang W, Feng Y, Wu H, Liu L, Pan Y, Huang Y, Chen Z, Li W, Huang Y, Lin G, Zhang Y, Ren Y, Xu K, Yu Y, Peng Y, **Pan X***, Pan S*, Hu H*, Hu Y*. Prenatal p25-activated Cdk5 induces pituitary tumorigenesis through MCM2 phosphorylation-mediated cell proliferation. **Neoplasia** 57, 101054, doi:10.1016/j.neo.2024.101054 (2024).**(IF 6.3)**

3. Gao J, Wu Y, Yu J, Qiu Y, Yi T, Luo C, Zhang J, Lu G, Li X, Xiong F, Wu X*, **Pan X***. Impact of genomic and epigenomic alterations of multigene on a multicancer pedigree. **Cancer Medicine** 13(13):e7394. doi: 10.1002/cam4.7394 (2024). **(IF 4.7)**

4. Chen F, Zhang K, Wang M, He Z, Yu B, Wang X, **Pan X**, Luo Y, Xu S, Lau JTY, Han C, Shi Y, Sun YE, Li S, Hu YP. VEGF-FGF Signaling Activates Quiescent CD63(+) Liver Stem Cells to Proliferate and Differentiate. **Adv Sci** (Weinh) 11, e2308711, doi:10.1002/advs.202308711 (2024). **(IF 14.3)**

5. Mai L, Wen Z, Zhang Y, Gao Y, Lin G, Lian Z, Yang X, Zhou J, Lin X, Luo C, Peng W, Chen C, Peng J, Liu D, Marjani SL, Tao Q, Cui Y, Zhang J, Wu X, Weissman SM, **Pan X***. Shortcut barcoding and early pooling for scalable multiplex single-cell reduced-representation CpG methylation sequencing at single nucleotide resolution. **Nucleic Acids Res** 51, e108, doi:10.1093/nar/gkad892 (2023).**(IF 19.1)**

6. Wu F, Wu F, Zhou Q, Liu X, Fei J, Zhang D, Wang W, Tao Y, Lin Y, Lin Q, **Pan X**, Sun K, Xie F, Bai L. A CCL2(+)DPP4(+) subset of mesenchymal stem cells expedites aberrant formation of creeping fat in humans. **Nat Commun** 14, 5830, doi:10.1038/s41467-023-41418-z (2023). **(IF 24.9)**

7. Bai X, Guo ZQ, Zhang YP, Fan ZZ, Liu LJ, Liu L, Long LL, Ma SC, Wang J, Fang Y, Tang XR, Zeng YJ, **Pan X***, Wu DH*, Dong ZY*. CDK4/6 inhibition triggers ICAM1-driven immune response and sensitizes LKB1 mutant lung cancer to immunotherapy. **Nat Commun** 14, 1247, doi:10.1038/s41467-023-36892-4 (2023). **(IF 24.9)**

8. Long LL, Ma SC, Guo ZQ, Zhang YP, Fan Z, Liu LJ, Liu L, Han DD, Leng MX, Wang J, Guo XJ, Tan JL, Cai XT, Lin Y, **Pan X**, Wu DH, Bai X, Dong ZY. PARP Inhibition Induces Synthetic Lethality and Adaptive Immunity in

LKB1-Mutant Lung Cancer. **Cancer Res** 83, 568-581, doi:10.1158/0008-5472.CAN-22-1740 (2023). **(IF 13.8)**

9. Trubetskoy V, Pardiñas AF.....**Pan X**, ...Ripke S, Walters JTR, O'Donovan MC; Schizophrenia Working Group of the Psychiatric Genomics Consortium. Mapping genomic loci implicates genes and synaptic biology in schizophrenia. **Nature** 604, 502-508, doi:10.1038/s41586-022-04434-5 (2022).**(IF 83.4)**

10. Zhang Y, Xu S, Wen Z, Gao J, Li S, Weissman SM, **Pan X***. Sample-multiplexing approaches for single-cell sequencing. **Cell Mol Life Sci** 79, 466, doi:10.1007/s00018-022-04482-0 (2022).**(IF 9.2)**

11. Zhong C, Liu M, **Pan, X*** & Zhu H*. Tumorigenicity risk of iPSCs in vivo: nip it in the bud. **Precis Clin Med** 5, pbac004, doi:10.1093/pcmedi/pbac004 (2022).**(IF 5.3,** 潘為創刊副主編)

12. Qu R, He K, Yang Y, Fan T, Sun B, Khan AU, Huang W*, Ouyang J*, **Pan X***, Dai J*. The role of serum amyloid A1 in the adipogenic differentiation of human adipose-derived stem cells basing on single-cell RNA sequencing analysis. **Stem Cell Res Ther** 13, 187, doi:10.1186/s13287-022-02873-5 (2022).**(IF 8.1)**

13. Zhang H*, Wang L, Qiu Y, Gong F, Nong B and **Pan X***. Discovery of 194 Unreported Conopeptides and Identification of a New Protein Disulfide Isomerase in Conus caracteristicus Using Integrated Transcriptomic and Proteomic Analysis. **Front Mar Sci** 9:792908. doi: 10.3389/fmars.2022.792908. (2022).(JCR Q1)

14. Zhang H* , Liang A and **Pan X***. Preparation and Functional Identification of a Novel Conotoxin QcMNCL-XIII0.1 from Conus quercinus. **Toxins** (Basel) 14(2):99. doi.org/10.3390/toxins14020099 (2022).(JCR Q1)

15. Lu Y, Liu M, Yang J, Weissman SM, **Pan X***, Katz SG*, Wang S*. Spatial transcriptome profiling by MERFISH reveals fetal liver hematopoietic stem cell niche architecture. **Cell Discov** 7, 47, doi:10.1038/s41421-021-00266-1 (2021).**(IF 38.9)**

16. Mai L, Qiu Y, Lian Z, Chen C, Wang L, Yin Y, Wang S, Yang X, Li Y, Peng W, Luo C, **Pan X***. MustSeq, an alternative approach for multiplexible strand-specific 3' end sequencing of mRNA transcriptome confers high efficiency and practicality. **RNA Biol** 18, 232-243, doi:10.1080/15476286.2021.1974208 (2021).**(IF 5.48)**

17. He K, Chen X, Qiu YB, Liu Z, Wang WZ, Woodman N, Maldonado JE, **Pan X**. Mitogenome and phylogenetic analyses support rapid diversification among species groups of small-eared shrews genus Cryptotis (Mammalia: Eulipotyphla: Soricidae). **Zool Res** 42, 739-745, doi:10.24272/j.issn.2095-8137.2021.199 (2021).(JCR Q1)

18. Luo C, Peng W, Kang J, Chen C, Peng J, Wang Y, Tang Q, Xie H, Li Y, **Pan X*.** Glutamine Regulates Cell Growth and Casein Synthesis through the

CYTHs/ARFGAP1-Arf1-mTORC1 Pathway in Bovine Mammary Epithelial Cells (cover story). **J Agric Food Chem** 69, 6810-6819, doi:10.1021/acs.jafc.1c02223 (2021).(JCR Q1)

19. Wang H, Gong P, Chen T, Gao S, Wu Z, Wang X, Li J, Marjani SL, Costa J, Weissman SM, Qi F*, **Pan X***, Liu L*. Colorectal Cancer Stem Cell States Uncovered by Simultaneous Single-Cell Analysis of Transcriptome and Telomeres. **Adv Sci** (Weinh) 8, 2004320, doi:10.1002/advs.202004320 (2021).**(IF 15.1)**

20. Zhou Y, Yang D, Yang Q, Lv X, Huang W, Zhou Z, Wang Y, Zhang Z, Yuan T, Ding X, Tang L, Zhang J, Yin J, Huang Y, Yu W, Wang Y, Zhou C, Su Y, He A, Sun Y, Shen Z, Qian B, Meng W, Fei J, Yao Y*, **Pan X***, Chen P*, Hu H*. Single-cell RNA landscape of intratumoral heterogeneity and immunosuppressive microenvironment in advanced osteosarcoma. **Nat Commun** 11, 6322, doi:10.1038/s41467-020-20059-6 (2020).**(IF 24.9) 高被引論文。**

21. Ma X, Guo J, Liu K, Chen L, Liu D, Dong S, Xia J, Long Q, Yue Y, Zhao P, Hu F, Xiao Z, **Pan X**, Xiao K, Cheng Z, Ke Z, Chen ZS, Zou C. Identification of a distinct luminal subgroup diagnosing and stratifying early stage prostate cancer by tissue-based single-cell RNA sequencing. **Mol Cancer** 19, 147, doi:10.1186/s12943-020-01264-9 (2020).**(IF 41.4)**

22. ENCODE Project Consortium (**Pan X** as a member); Moore JE, Purcaro MJ, Pratt HE, Epstein CB, et al. Expanded encyclopaedias of DNA elements in the human and mouse genomes. **Nature** 583, 699-710, doi:10.1038/s41586-020-2493-4 (2020).**(IF 83.4)**

23. ENCODE Project Consortium (**Pan X** as a member), Snyder MP, Gingeras TR, Moore JE, Weng Z, et al. Perspectives on ENCODE. **Nature** 583:693-698. doi: 10.1038/s41586-020-2449-8 (2020).**(IF 83.4)**

24. Huang P, Zhao Y, Zhong J, Zhang X, Liu Q, Qiu X, Chen S, Yan H, Hillyer C, Mohandas N, **Pan X***, Xu X*. Putative regulators for the continuum of erythroid differentiation revealed by single-cell transcriptome of human BM and UCB cells. **Proc Natl Acad Sci U S A** 117, 12868-12876, doi:10.1073/pnas.1915085117 (2020).**(IF 12.8)**

25. Situ B, Ye X, Zhao Q, Mai L, Huang Y, Wang S, Chen J, Li B, He B, Zhang Y, Zou J, Tang BZ, **Pan X**, Zheng L. Identification and Single-Cell Analysis of Viable Circulating Tumor Cells by a Mitochondrion-Specific AIE Bioprobe. **Adv Sci** (Weinh) 7, 1902760, doi:10.1002/advs.201902760 (2020).**(IF 15.1)**

26. Cen B, Wei Y, Huang W, Teng M, He S, Li J, Wang W, He G, Bai X, Liu X, Yuan Y, **Pan X***, Ji A*. An Efficient Bivalent Cyclic RGD-PIK3CB siRNA Conjugate for Specific Targeted Therapy against Glioblastoma In Vitro and In Vivo. **Mol Ther Nucleic Acids** 13, 220-232, doi:10.1016/j.omtn.2018.09.002 (2018).**(IF 8.1)**

27. Cen B, Liao W, Wang Z, Gao L, Wei Y, Huang W, He S, Wang W, Liu X, **Pan X***, Ji A*. Gelofusine Attenuates Tubulointerstitial Injury Induced by cRGD-Conjugated siRNA by Regulating the TLR3 Signaling Pathway. **Mol Ther Nucleic Acids** 11, 300-311, doi:10.1016/j.omtn.2018.03.006 (2018).**(IF 8.1)**

28. Zhang J*, Spath SS, Marjani SL, Zhang W & **Pan X***. Characterization of cancer genomic heterogeneity by next-generation sequencing advances precision medicine in cancer treatment. **Precis Clin Med** 1, 29-48, doi:10.1093/pcmedi/pby007 (2018). **(IF 5.3,** 潘為創刊副主編)

29. Han L, Wu HJ, Zhu H, Kim KY, Marjani SL, Riester M, Euskirchen G, Zi X, Yang J, Han J, Snyder M, Park IH, Irizarry R, Weissman SM, Michor F*, Fan R*, **Pan X***. Bisulfite-independent analysis of CpG island methylation enables genome-scale stratification of single cells. **Nucleic Acids Res** 45(10):e77, doi:10.1093/nar/gkx026 (2017). **(IF 19.1)**

30. Yang J, Tanaka Y, Seay M, Li Z, Jin J, Garmire LX, Zhu X, Taylor A, Li W, Euskirchen G, Halene S, Kluger Y, Snyder MP, Park IH, **Pan X***, Weissman SM*. Single cell transcriptomics reveals unanticipated features of early hematopoietic precursors. **Nucleic Acids Res** 45, 1281-1296, doi:10.1093/nar/gkw1214 (2017).**(IF 19.1)**

31. Wu H, Zhang XY, Hu Z, Hou Q, Zhang H, Li Y, Li S, Yue J, Jiang Z, Weissman SM, **Pan X***, Ju BG*, Wu S*. Evolution and heterogeneity of non-hereditary colorectal cancer revealed by single-cell exome sequencing. **Oncogene** 36, 2857-2867, doi:10.1038/onc.2016.438 (2017).**(IF 9.9)**

32. Zhu W, Zhang XY, Marjani SL, Zhang J, Zhang W, Wu S*, **Pan X***. Next-generation molecular diagnosis: single-cell sequencing from bench to bedside. **Cell Mol Life Sci** 74, 869-880, doi:10.1007/s00018-016-2368-x (2017).**(IF 9.2)**

33. Zhang X, Marjani SL, Hu Z, Weissman SM, **Pan X***, Wu S*. Single-Cell Sequencing for Precise Cancer Research: Progress and Prospects. **Cancer Res** 76, 1305-1312, doi:10.1158/0008-5472.CAN-15-1907 (2016). **(IF 12.5)**

34. Cheng J, Roden CA, Pan W, Zhu S, Baccei A, **Pan X,** Jiang T, Kluger Y, Weissman SM, Guo S, Flavell RA, Ding Y, Lu J. A Molecular Chipper technology for CRISPR sgRNA library generation and functional mapping of noncoding regions. **Nat Commun** 7, 11178, doi:10.1038/ncomms11178 (2016).**(IF 24.9)**

35. Hysolli E, Tanaka Y, Su J, Kim KY, Zhong T, Janknecht R, Zhou XL, Geng L, Qiu C, **Pan X**, Jung YW, Cheng J, Lu J, Zhong M, Weissman SM, Park IH. Regulation of the DNA Methylation Landscape in Human Somatic Cell Reprogramming by the miR-29 Family. **Stem Cell Reports** 7, 43-54, doi:10.1016/j.stemcr.2016.05.014 (2016).**(IF 7.3)**

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R, Garmire LX, Cotton MJ, Drier Y, Bernstein B, Geginat J, Stockinger B, Esplugues E, Huber S, Flavell RA. Th17 cells transdifferentiate into regulatory T cells during resolution of inflammation. **Nature** 523, 221-225, doi:10.1038/nature14452 (2015).**(IF 83.4)**

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39. Liu N, Liu L* & **Pan X***. Single-cell analysis of the transcriptome and its application in the characterization of stem cells and early embryos. **Cell Mol Life Sci** 71, 2707-2715, doi:10.1007/s00018-014-1601-8 (2014).**(IF 9.2)**

40. Guo S, Zi X, Schulz VP, Cheng J, Zhong M, Koochaki SH, Megyola CM, **Pan X**, Heydari K, Weissman SM, Gallagher PG, Krause DS, Fan R, Lu J. Nonstochastic reprogramming from a privileged somatic cell state. **Cell** 156, 649-662, doi:10.1016/j.cell.2014.01.020 (2014).**(IF 66.8)**

41. Han L, Zi X, Garmire LX, Wu Y, Weissman SM, **Pan X***, Fan R*. Co-detection and sequencing of genes and transcripts from the same single cells facilitated by a microfluidics platform. **Sci Rep** 4, 6485, doi:10.1038/srep06485 (2014).**(IF 5)**

42. **Pan X**. Single Cell Analysis: From Technology to Biology and Medicine.

Single Cell Biol 3, doi:10.4172/2168-9431.1000106 (2014).(潘為創刊主編)

43. Tanaka Y, Kim KY, Zhong M, **Pan X**, Weissman SM, Park IH. Transcriptional regulation in pluripotent stem cells by methyl CpG-binding protein 2 (MeCP2). **Hum Mol Genet** 23, 1045-1055, doi:10.1093/hmg/ddt500 (2014).**(IF 9.3)**

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工作及培訓經驗 Working and Training Experiences

潘星華，理學博士，醫學碩士，醫學學士；澳門科技大學醫學部精準再生醫學研

究中心教授，兼澳門科技大學中藥品質控制國家重點實驗室教授，生物醫學科學博士生導師、藥學碩士生導師。

2017-2024 年擔任南方醫科大學教授，基礎醫學院學術委員會委員、生物化學與分子生物學教研室（即基因工程研究所）主任、廣東省單細胞技術與應用重點實驗室創始人和主任（現學術委員會副主任），初入職時擔任廣東省生物晶片重點實驗室主任；申報省珠江學者學科和省特支計畫學科獲批並擔任負責人。先後擔任深圳灣實驗室開放基金 PI、南方醫院、珠江醫院、廣東省人民醫院、東莞婦幼保健院雙聘教授，也兼為精神健康研究教育部重點實驗室和華南傳染病防治教育部重點實驗室 PI。2004-2017 年為美國耶魯大學（Yale University）醫學院遺傳系副研究員、研究員和項目 PI，並兼為耶魯卓越基因組中心、癌症中心和幹細胞中心成員。2000-2004 年在美國分子平臺公司（Molecular Staging Inc.，後獲 Qiagen 並購）基因組學部擔任研究員和酶學主任，兼耶魯大學客座研究員。1994 年底到 1997 間在上海海軍醫科大學生物學教研室擔任醫學遺傳學和細胞生物學副教授。

先後在南方醫科大學臨床醫學和基礎醫學院（1980-1988）、復旦大學遺傳與遺傳工程系（1989-1993）、中國醫學科學院暨北京協和醫學院（CAMS & PUMC）腫瘤醫院分子腫瘤學國家重點實驗室（1993-1994）和美國耶魯大學遺傳學系暨分子醫學波義中心（Boyer Center）分子腫瘤學與發育專案（1997-1999）獲得了學士、碩士、博士學位和 2 期博士後培訓，先後師從談家楨、吳旻和 Sherman M. Weissman 教授等中國和美國國家科學院院士三位院士。期間在北京大學生物系（學習果蠅染色體技術）、澳大利亞墨爾本大學及路德維希癌症研究所（受日內瓦國際抗癌聯盟/UICC 資助學習分子腫瘤學)和美國紐約冷泉港實驗室(受 CSHL

資助學習人工酵母染色體技術）短期進修。

潘博士先後培養博士後/訪問學者、博士、碩士和醫學生 60 多名，近年曾為近一萬名本科生和研究生授課。

研究興趣和成就 Research Interests and Achievements

潘星華課題組的主要研究方向主要是單細胞組學技術創新和應用、幹細胞與衰老和再生醫學、腫瘤異質性與精準醫學、組學生物資訊學、中醫藥組學等。

作為單細胞組學技術創新的早期探索者之一，近二十餘年來專攻單細胞組學核心技術創新及其生物醫藥多個領域的應用研究，先後創新單細胞技術 10 餘項，包括單細胞基因組（參與開發 REPLIg 技術，創建全基因組擴增技術 WPA 和拷貝數變異測序技術 msCNVS）、轉錄組（2 種技術 PMA, SMA 及 MUST-seq）和表觀組多種技術（包括 DNA 甲基化 2 種測序技術 scCGI-seq 和 msRRBS，及染色質圖譜技術）、單細胞雙重多樣品測序方案 (NAMUL-seq)，首創單細胞多維組學技術(首報單細胞 RNA+DNA 分析技術）及單細胞端粒長度檢測技術（SCT-pqPCR, USC-STELA）等。當前正在進一步探索 msCNVS 和 msRRBS 在腫瘤（液體活檢，循環癌細胞 CTC/殘留病/MRD）和產前及植入前胚胎遺傳病（PGT，NIPT）的基因組突變和表觀基因組檢測等，並進行高通量升級為基礎科研服務。

同時，主要應用單細胞組學、空間組學、多維組學、生物資訊學和機器學習等前沿技術手段，結合先進的細胞、分子方法，及動物實驗、大型臨床樣本和公共數據，探索不同生理系統和疾病的特殊機制、精準防治和他們的內在共同規律。近年來，他研究多種實體瘤（尤其是肝纖維化和肝癌，以及甲狀腺癌、結直腸癌、

肺癌、骨肉瘤）以及白血病 MDS/AML 和 ALL 的異質性和進化、幹細胞/起始細胞和可塑性、細胞微環境、生物標誌物和精準醫學（診斷、治療、藥物反應）模型；多種幹細胞和祖細胞（特別是造血幹祖細胞/HSPC、間充質幹細胞/MSC）、類器官、發育、衰老和再生；神經元和腦病、炎症性腸病/IBD 等疾病組學；以及中醫藥組學。潘星華熱情尋求與不同學科的臨床醫生和科學家的合作。

先後獲中美發明專利授權 15 項，及發明專利多項在審查中，獲得廣泛應用或成功轉化產品或試劑盒 5 項。迄今學術著作獲 Google Scholar 收錄 160 餘篇，總影響因數超 1000，總被引用 8500 多次。主要論文包括期刊 PNAS x7、Adv Science x4、Nucleic Acids Res x3、Nat Comm x3、Cell Mol Life Sci x3、Stem Cell Reports x3、Cancer Res x2、Cell Discov x1、Oncogene x1 及 Cell x1 和 Nature x4 篇，其中作為人類基因組 DNA 元素百科全書計畫/ENCODE 聯盟成員參與 Nature x3 篇；主編研究專題/單一著作 Introduction to Single Cell Omics 2019 年電子版獲得全球點閱 34 萬多次,下載 5 萬多次。

基於其部分單細胞組學研究成果，潘星華獲得 GEN（Genetic Engineering & Biotechnology News，2015）獨家報導、美國國家科學院進展雜志俱樂部的采訪（PNAS Club，2013）及 Technology Networks 的專門采訪和報導（2018）。

研究課題獲得中國國家自然科學基金、科技部重大專項基金、衛健委、教育部、廣東省重大基礎培育項目、廣東省基礎與應用基礎研究重點項目和麵上項目、廣東省珠江領軍人才創新團隊、廣東省重點實驗室基金和澳門科技大學研究基金等資助，早前獲得美國國立衛生研究院、自然科學基金會及康州幹細胞基金會等多項基金和中國博士後科學基金及國自然青年基金支持。

學術兼職和榮譽 Scholastic Services and Honors

潘星華擔任廣東省生物化學與分子生物學學會副理事長,廣東省醫學遺傳學會常務理事,中國生物化學與分子生物學會基礎醫學專委會委員,全國僑聯特聘專家和生物醫藥專委會委員,中國抗癌協會生物標誌專委會委員,海峽兩岸醫藥衛生交流協會遺傳與生殖專委會常委,江西省系統生物醫學重點實驗室學術委員會主任(現顧問),精準醫學四川省重點實驗室學術委員;曾任印度 Advances in NGS 國際顧問委員會委員;獲選相繼擔任全美中國旅美科技協會第 26-28 屆委員會會長、董事會主席和理事會主席(第 32 屆再任理事會主席)。

獲邀擔任 Nature Protocols、Nature Communications、Nucleic Acids Res、Genome Biology、Genome Research、Genome Medicine、Aging Cell、Protein and Cell、Genomics Proteomics and Bioinformatics 、 Computational and Structural Biotechnology、Science Bulletin 等 30 多種 SCI 雜志特邀評審專家或編輯及數種新興專業雜志顧問。是 Monocytomics 創刊副主篇,及 Precision Clinical Medicine 雜志(牛津大學出版社/OUP 出版)創刊副主編,也曾擔任歐洲出版社雜志 Frontiers 的研究專題主編。目前還擔任中國生物化學與分子生物學學報單細胞與空間組學主題專刊執行主編,教育部 101 計畫核心教材《醫學分子細胞遺傳基礎》編委。

在國際國內專業大會發表主題報告或專題報告超 100 次,主持組織和參與組織國際學術會議多次,包括主導發起和擔任大會共同主席的首屆至迄今第三屆國際單細胞和空間組學大會(TICSSO, 2022-2025,杭州/廣州、深圳、即將在上海),擔任主席組織了國際壹細胞菁英論壇第一到十期(FOSCE, 2021-2023),參與組織第二至十屆華西精準醫學國際學術論壇等。

是英國醫學研究理事會(MRC)、比利時癌症研究基金會和中國國家自然科技

基金委、科技部、中國科學院及廣東省、浙江省、廣西省、福建省及深圳、佛山、東莞、成都、杭州、西安等多個省市科研基金的特邀評審專家，教育部學位與研究生教育發展中心特邀博士論文評審專家（答辯前盲審，答辯後抽檢）；曾為清華大學深圳研究院、中山大學、上海交通大學、華南理工大學、廣東醫科大學、廣州醫科大學等博士學位論文答辯、論文評審或教授職稱評審服務。

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Being interviewed by scientific magazines:
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