

Professor Xinghua (Victor) Pan, PhD, MD

潘星华博士，教授，生物医学科学博士生导师，药学硕士生导师

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(Profile in English and Chinese 英文和中文简历)

CURRENT RESEARCH INTERESTS IN BRIEF 当前研究方向

- (1) 单细胞组学技术创新和应用
Single cell technology innovation and application
- (2) 干细胞与衰老和再生医学
Stem cell and aging and regenerative medicine
- (3) 肿瘤异质性与精准医学
Cancer heterogeneity and precision medicine
- (4) 组学生物信息学
Bioinformatics for omics data
- (5) 中医药组学
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

(*通讯作者, IF 为最高影响因子)

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/pccmedi/pbac004 (2022).(**IF 5.3**, 潘为创刊副主编)

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 characteristicus* 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 multiplexable 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) 高被引论文。

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)(潘为创刊副主编)

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)

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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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and Regulation in Human Somatic Cell Reprogramming. **Stem Cell Reports** 4, 1125-1139, doi:10.1016/j.stemcr.2015.04.009 (2015).(IF 7.3)

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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).(潘为创刊主编)

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工作和学习简历 Working and Training Experiences

潘星华, 理学博士, 医学硕士, 医学学士; 澳门科技大学医学部精准再生医学研究中心教授, 兼澳门科技大学中药质量控制国家重点实验室教授, 生物医学科学博士生导师、药学硕士生导师。

2017-2024 年担任南方医科大学教授, 基础医学院学术委员会委员、生物化学与分子生物学教研室(即基因工程研究所)主任、广东省单细胞技术与应用重点实验室创始人和主任(现学术委员会副主任), 初入职时担任广东省生物芯片重点实验室主任; 申报省珠江学者学科和省特支计划学科获批并担任负责人。先后担任深圳湾实验室开放基金 PI、南方医院、珠江医院、广东省人民医院、东莞妇幼保健院双聘教授, 也兼为精神健康研究教育部重点实验室和华南传染病防治教育部重点实验室 PI。2004-2017 年为美国耶鲁大学(Yale University)医学院遗传系副研究员、研究员和项目 PI, 并兼为耶鲁卓越基因组中心、癌症中心和干细

胞中心成员。2000-2004 年在美国分子平台公司 (Molecular Staging Inc., 后获 Qiagen 并购) 基因组学部担任研究员和酶学主任, 兼耶鲁大学客座研究员。1994 年底到 1997 间在上海海军医科大学生物学教研室担任医学遗传学和细胞生物学副教授。

先后在南方医科大学临床医学和基础医学院 (1980-1988)、复旦大学遗传与遗传工程系 (1989-1993)、中国医学科学院暨北京协和医学院 (CAMS & PUMC) 肿瘤医院分子肿瘤学国家重点实验室 (1993-1994) 和美国耶鲁大学遗传学系暨分子医学波义中心 (Boyer Center) 分子肿瘤学与发育项目 (1997-1999) 获得了学士、硕士、博士学位和 2 期博士后培训, 先后师从谈家桢、吴旻和 Sherman M. Weissman 教授等中国和美国国家科学院院士三位院士。期间在北京大学生物系 (学习果蝇染色体技术)、澳大利亚墨尔本大学及路德维希癌症研究所 (受日内瓦国际抗癌联盟/UICC 资助学习分子肿瘤学) 和美国纽约冷泉港实验室 (受 CSHL 资助学习人工酵母染色体技术) 短期进修。

潘博士先后培养博士后/访问学者、博士、硕士和医学生 60 多名, 近年曾为近一万余名本科生和研究生授课。

研究兴趣和成绩 Research Interests and Achievements

潘星华课题组的主要研究方向主要是单细胞组学技术创新和应用、干细胞与衰老和再生医学、肿瘤异质性与精准医学、组学生物信息学、中医药组学等。

作为单细胞组学技术创新的早期探索者之一, 近二十余年来专攻单细胞组学核心技术创新及其生物医药多个领域的应用研究, 先后创新单细胞技术 10 余项, 包括单细胞基因组 (参与开发 REPLIg 技术, 创建全基因组扩增技术 WPA 和拷贝数变异测序技术 msCNVS)、转录组 (2 种技术 PMA, SMA 及 MUST-seq) 和表观组多种技术 (包括 DNA 甲基化 2 种测序技术 scCGI-seq 和 msRRBS, 及染色质图谱技术)、单细胞双重多样品测序方案 (NAMUL-seq), 首创单细胞多维组学技术 (首报单细胞 RNA+DNA 分析技术) 及单细胞端粒长度检测技术 (SCT-pqPCR, USC-STELA) 等。当前正在进一步探索 msCNVS 和 msRRBS 在肿瘤 (液体活检, 循环癌细胞 CTC/残留病/MRD) 和产前及植入前胚胎遗传病 (PGT, NIPT) 的基因组突变和表观基因组检测等, 并进行高通量升级为基础研究服务。

同时, 主要应用单细胞组学、空间组学、多维组学、生物信息学和机器学习等前沿技术手段, 结合先进的细胞、分子方法, 及动物实验、大型临床样本和公共数据, 探索不同生理系统和疾病的特殊机制、精准防治和他们的内在共同规律。近年来, 他研究多种实体瘤 (尤其是肝纤维化和肝癌, 以及甲状腺癌、结直肠癌、肺癌、骨肉瘤) 以及白血病 MDS/AML 和 ALL 的异质性和进化、干细胞/起始细胞和可塑性、细胞微环境、生物标志物和精准医学 (诊断、治疗、药物反应) 模型; 多种干细胞和祖细胞 (特别是造血干祖细胞/HSPC、间充质干细胞/MSC)、类器官、发育、衰老和再生; 神经元和脑病、炎症性肠病/IBD 等疾病组学; 以及中医药组学。潘星华热情寻求与不同学科的临床医生和科学家的合作。

先后获中美发明专利授权 15 项, 及发明专利多项在审查中, 获得广泛应用或成功转化产品或试剂盒 5 项。迄今学术著作获 Google Scholar 收录 160 余篇, 总影

响因子超 1000，总被引用 8500 多次。主要论文包括期刊 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，其中作为人类基因组 DNA 元素百科全书计划/ENCODE 联盟成员参与 Nature x3 篇；主编研究专题/单一著作 Introduction to Single Cell Omics 2019 年电子版获得全球点阅 34 万多次，下载 5 万多次。

基于其部分单细胞组学研究成果，潘星华获得 GEN (Genetic Engineering & Biotechnology News, 2015) 独家报导、美国国家科学院进展杂志俱乐部的采访 (PNAS Club, 2013) 及 Technology Networks 的专门采访和报导 (2018)。

研究课题获得中国国家自然科学基金、科技部重大专项基金、卫健委、教育部、广东省重大基础培育项目、广东省基础与应用基础研究重点项目和面上项目、广东省珠江领军人才创新团队、广东省重点实验室基金和澳门科技大学研究基金等资助，早前获得美国国立卫生研究院、自然科学基金会及康州干细胞基金会等多项基金和中国博士后科学基金及国自然青年基金支持。

学术兼职和荣誉 Scholastic Services and Honors

潘星华担任广东省生物化学与分子生物学学会副理事长，广东省医学遗传学会常务理事，中国生物化学与分子生物学会基础医学专委会委员，全国侨联特聘专家和生物医药专委会委员，中国抗癌协会生物标志专委会委员，海峡两岸医药卫生交流协会遗传与生殖专委会常委，江西省系统生物医学重点实验室学术委员会主任 (现顾问)，精准医学四川省重点实验室学术委员；曾任印度 Advances in NGS 国际顾问委员会委员；获选相继担任全美中国旅美科技协会第 26-28 届委员会会长、董事会主席和理事会主席 (第 32 届再任理事会主席)。

获邀担任 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 多种 SCI 杂志特邀评审专家或编辑及数种新兴专业杂志顾问。是 Monocytomics 创刊副主编，及 Precision Clinical Medicine 杂志 (牛津大学出版社/OUP 出版) 创刊副主编，也曾担任欧洲出版社杂志 Frontiers 的研究专题主编。目前还担任中国生物化学与分子生物学学报单细胞与空间组学主题专刊执行主编，教育部 101 计划核心教材《医学分子细胞遗传基础》编委。

在国际国内专业大会发表主题报告或专题报告超 100 次，主持组织和参与组织国际学术会议多次，包括主导发起和担任大会共同主席的首届至迄今第三届国际单细胞和空间组学大会 (TICSSO, 2022-2025, 杭州/广州、深圳、即将在上海)，担任主席组织了国际壹细胞菁英论坛第一到十期 (FOSCE, 2021-2023)，参与组织第二至十届华西精准医学国际学术论坛等。

是英国医学研究理事会 (MRC)、比利时癌症研究基金会和中国国家自然科学基金委、科技部、中国科学院及广东省、浙江省、广西省、福建省及深圳、佛山、东莞、成都、杭州、西安等多个省市科研基金的特邀评审专家，教育部学位与研究生教育发展研究中心特邀博士论文评审专家 (答辩前盲审，答辩后抽检)；曾为清华大学深圳研究院、中山大学、上海交通大学、华南理工大学、广东医科大学、

广州医科大学等博士学位论文答辩、论文评审或教授职称评审服务。

曾获聘兼任杭州市肿瘤医院特邀专家，暨南大学研究员，四川大学和广东药科大学等客座教授等。获得广州市高层次人才、南京市领军人才、江西省赣鄱英才-高端柔性特聘教授等。获得国际科学组织 VEBLEO 会士、PolyGenomics 多基因组学学术奖及 CastUSA 单细胞基因组学先锋奖。

MUST scholar: <https://scholar.must.edu.mo/scholar/106820>

ORCID: <https://orcid.org/0000-0002-7421-8155>

Being interviewed by scientific magazines:

<https://www.genengnews.com/insights/single-and-loving-it/?q=fluidigm>

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An the leading Editor of a research topic and its corresponding eBook

<https://www.frontiersin.org/research-topics/4004/single-cell-genomics-technology-and-application>

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