

# GUANGCHUANG YU

Professor of Bioinformatics at [Southern Medical University](#). I have developed more than 20 R packages, including [clusterProfiler](#), [ChIPseeker](#), [treeio](#) and [ggtree](#), to help biologists to explore and understand their data.

I am broadly interested in bioinformatics, metagenomics, molecular evolution, data integration and visualization.



## 💻 RESEARCH EXPERIENCE

- present | 2018 ● **Professor**  
School of Basic Medical Sciences     📍 Southern Medical University
  - 2021-present, Director, Department of Bioinformatics
  - 2019-2021, Associate director, Department of Bioinformatics
- 2018 | 2017 ● **Post-doctoral Fellow**  
State Key Laboratory of Infectious Diseases  
📍 The University of Hong Kong
- 2013 | 2009 ● **Bioinformatician**  
Key Laboratory of Functional Protein Research of Guangdong Higher Education Institutes  
📍 Jinan University

## 🎓 EDUCATION

- 2017 | 2013 ● **PhD., Bioinformatics**  
The University of Hong Kong     📍 Hong Kong, CN
  - Thesis: Big-data computational methods for studying molecular evolution: from accurate genome assembly to phylogenetic analysis and data integration
- 2009 | 2006 ● **M.S., Biochemistry and Molecular Biology**  
Anhui Medical University     📍 Hefei, CN
  - Thesis: miRNA靶基因计算分析新方法及其应用研究
- 2005 | 2001 ● **B.S., Biotechnology**  
South China Agricultural University     📍 Guangzhou, CN
- 2019 ● **Antigenic cartography and antibody landscapes course**  
University of Cambridge     📍 Cambridge, UK
- 2018 ● **南方医科大学高层次人才“不忘初心 牢记使命”学习教育**  
延安干部培训学院     📍 Yan'an, CN

## CONTACT

- ✉ [gcyu1@smu.edu.cn](mailto:gcyu1@smu.edu.cn)
- 🐦 [guangchuangyu](#)
- 🔗 [github.com/YuLab-SMU](#)
- 🔗 <https://yulab-smu.top/>
- wechat [YuLabSMU](#) (公众号)
- 📞 (86) 13826432521

Citation = 18626

H-index = 24

I10-index = 35



Last updated on 2022-05-24.

- **Train the Trainers**  
Institut Pasteur 📍 Paris, FR  
2015
- **Visiting student**  
Beijing Institute of Radiation Medicine 📍 Beijing, CN  
2009  
|  
2007

## ≡ CERTIFICATE

- **高等学校教师资格**  
广东省教育厅  
2019
- **Certificate of Teaching and Learning in Higher Education**  
Centre for Enhancement of Teaching and Learning  
The University of Hong Kong  
2015



## 🏆 SCHOLARSHIPS & AWARDS

- **2020学年教学优秀一等奖**  
南方医科大学  
2022
- **2021年中国高被引学者**  
Elsevier  
2021
- **2020全球前2%顶尖科学家**  
美国斯坦福大学  
2021
- **2020年中国高被引学者**  
Elsevier  
2017  
|  
2013
- **Postgraduate studentships**  
The University of Hong Kong  
2012
- **Best paper of the year 2010**  
Journal of Integrated OMICS  
2012



## ↗ GRANTS

- **大样本多组学数据联合分析系统研究与构建**  
主持, CNY ¥600,000, 国家级项目  
2022  
|  
2020
- **南方医科大学第三层次人才引进科研项目 (G618289088)**  
主持, CNY ¥1,500,000  
2020  
|  
2018
- **病毒性新发传染病的研究与防治 (2017YFE0190800)**  
参与, CNY ¥990,000, 中华人民共和国科学技术部, 国家重点研发计划  
2018

- 2013
- hnRNP蛋白在调控人肺癌细胞周期胞质分裂中的作用研究 (21613414)  
主持, CNY ¥100,000, 中央高校基本科研业务费专项资金
- 2011
- Hela细胞周期动态蛋白质组学分析 (21611303)  
主持, CNY ¥20,000, 中央高校基本科研业务费专项资金

## BOOKS

- 2022
- **Data Integration, Manipulation and Visualization of Phylogenetic Trees**  
ISBN: 9781032233574
    - G Yu
    - Chapman and Hall/CRC
  - **Biomedical Data Visualization: Methods and Applications**  
ISBN: 9782889761906
    - G Yu, TTY Lam, CL Xiao, M Zhou (eds.)
    - Lausanne: Frontiers Media SA
- 2020
- **Gene Ontology Semantic Similarity Analysis Using GOSemSim**  
ISBN: 9781071603000
    - G Yu
    - In: Kidder B. (eds) Stem Cell Transcriptional Networks, *Methods in Molecular Biology*, 2117:207-215.
    - Humana, New York, NY

## TEACHING EXPERIENCE

- present  
|  
2022
- **生物信息学**  
School of Basic Medical Sciences       Southern Medical University
    - Undergraduate level class (基础医学院士创新班)
- present  
|  
2021
- **基础医学研究与医学发展**  
School of Basic Medical Sciences       Southern Medical University
    - Undergraduate level class
- present  
|  
2019
- **基因组学**  
School of Basic Medical Sciences       Southern Medical University
    - Undergraduate level class
  - **基础医学新进展讲座**  
School of Basic Medical Sciences       Southern Medical University
    - Undergraduate level class

2022

- **毒理学原理与方法**  
School of Public Health · Graduate level class

Southern Medical University

2021

- **生物信息学科研训练**  
School of Basic Medical Sciences · Undergraduate level class

Southern Medical University

2019

- **BMB209: Workshops in Applied Bioinformatics**  
Department of Biochemistry and Molecular Biology · PhD level class, invited lecture

University of Southern Denmark

2012

- **功能蛋白质研究**  
College of Life Science and Technology · Graduate level class

Jinan University

| 2011

## PUBLICATIONS

2022

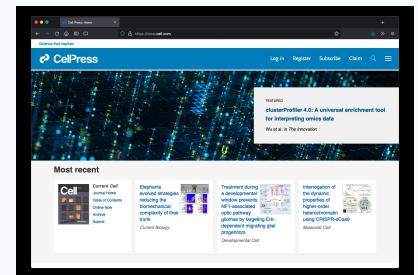
- **ggmsa: a visual exploration tool for multiple sequence alignment and associated data**  
*Briefings in Bioinformatics*. 2022.
  - L Zhou<sup>#</sup>, T Feng<sup>#</sup>, S Xu, F Gao, TT Lam, Q Wang, T Wu, H Huang, L Zhan, L Li, Y Guan, Z Dai\*, G Yu\*
- **CBNplot: Bayesian network plots for enrichment analysis**  
*Bioinformatics*. 2022, 38(10):2959-2960.
  - N Sato, Y Tamada, G Yu, Y Okuno\*
- **Editorial: Biomedical Data Visualization: Methods and Applications**  
*Frontiers in Genetics*. 2022, 13:890775.
  - T Wu, CL Xiao, TT Lam, G Yu\*
- **Altered gut microbiota as an auxiliary diagnostic indicator for patients with fracture-related infection**  
*Frontiers in Microbiology*. 2022, 13:723791.
  - X Zhao<sup>#</sup>, W Tang<sup>#</sup>, H Wan<sup>#</sup>, Z Lan H Qin, Q Lin, Y Hu, G Yu\*, N Jiang\*, B Yu\*

2021

- **Use ggbreak to effectively utilize plotting space to deal with large datasets and outliers**

*Frontiers in Genetics*. 2021, 12:774846.

· S Xu<sup>#</sup>, M Chen<sup>#</sup>, T Feng, L Zhan, L Zhou, G Yu\*



[clusterProfiler \(Wu et al. 2021\)](#),  
the featured article in 2021-08-24's website banner of Cell Press

- 2020
- **clusterProfiler 4.0: A universal enrichment tool for interpreting omics data**  
*The Innovation.* 2021, 2(3):100141.  
· T Wu<sup>#</sup>, E Hu<sup>#</sup>, S Xu, M Chen, P Guo, Z Dai, T Feng, L Zhou, W Tang, L Zhan, X Fu, S Liu, X Bo\*, G Yu\*
  - **ggtreeExtra: Compact visualization of richly annotated phylogenetic data**  
*Molecular Biology and Evolution.* 2021, 38(9):4039-4042.  
· S Xu, Z Dai, P Guo, X Fu, S Liu, L Zhou, W Tang, T Feng, M Chen, L Zhan, T Wu, E Hu, Y Jiang\*, X Bo\*, G Yu\*
  - **ggVennDiagram: An intuitive, easy-to-use, and highly customizable R package to generate Venn diagram**  
*Frontiers in Genetics.* 2021, 12:706907.  
· CH Gao, G Yu, P Cai\*
  - **IOBR: Multi-Omics Immuno-Oncology Biological Research to Decode Tumor Microenvironment and Signatures**  
*Frontiers in Immunology.* 2021, 12:687975.  
· D Zeng<sup>#</sup>, Z Ye<sup>#</sup>, R Shen, G Yu, J Wu, Y Xiong, R Zhou, W Qiu, N Huang, L Sun, X Li, J Bin, Y Liao, M Shi, W Liao\*
  - **nCov2019: an R package for studying the COVID-19 coronavirus pandemic**  
*PeerJ.* 2021, 9:e11421.  
· T Wu, E Hu, X Ge\*, G Yu\*\*
  - **TreeSummarizedExperiment: a S4 class for data with hierarchical structure**  
*F1000Research.* 2021, 9:1246.  
· R Huang, C Soneson, FGM Ernst, KC Rue-Albrecht, G Yu, SC Hicks, MD Robinson\*
  - **Identification of prognostic Stromal-Immune Score-Based Genes in Hepatocellular Carcinoma microenvironment**  
*Frontiers in Genetics.* 2021, 12: 625236.  
· S Liu, G Yu\*, L Liu\*, X Zou, L Zhou, E Hu, Y Song
  - **Gut microbiota and metabolite alterations associated with reduced bone mineral density or bone metabolic indexes in postmenopausal osteoporosis**  
*Aging (Albany NY).* 2020, 12(9):8583-8604.  
· J He<sup>#</sup>, S Xu<sup>#</sup>, B Zhang, C Xiao, Z Chen, F Si, J Fu, X Lin, G Zheng\*, G Yu\*, J Chen\*

- **Using ggtree to Visualize Data on Tree-Like Structure**  
*Current Protocols in Bioinformatics*, 69(1):e96  
 · G Yu\*
- **treeio: an R package for phylogenetic tree input and output with richly annotated and associated data**  
*Molecular Biology and Evolution*. 2020, 37(2):599-603.  
 · LG Wang, TTY Lam, S Xu, Z Dai, L Zhou, T Feng, P Guo, CW Dunn, BR Jones, T Bradley, H Zhu, Y Guan, Y Jiang, G Yu\*  
 · Impact Factor = 14.797
- **Rideogram: drawing SVG graphics to visualize and map genome-wide data on the idiograms**  
*PeerJ Computer Science* 2020, 6:e251.  
 · Z Hao, D Lv, Y Ge, J Shi, D Weijers, G Yu\*, J Chen\*
- **Two methods for mapping and visualizing associated data on phylogeny using ggtree**  
*Molecular Biology and Evolution*. 2018, 35(12):3041-3043.  
 · G Yu\*, TTY Lam, H Zhu, Y Guan\*  
 · Impact Factor = 14.797
- **Using meshes for MeSH term enrichment and semantic analyses**  
*Bioinformatics*. 2018, 34(21):3766–3767.  
 · G Yu\*
- **ggtree: an R package for visualization and annotation of phylogenetic trees with their covariates and other associated data**  
*Methods in Ecology and Evolution*. 2017, 8(1):28-36  
 · G Yu, DK Smith, H Zhu, Y Guan, TTY Lam\*  
 · 🏆 ESI Highly Cited Paper
- **ReactomePA: an R/Bioconductor package for reactome pathway analysis and visualization**  
*Molecular BioSystems*. 2016, 12(2):477-479  
 · G Yu, QY He\*  
 · 🏆 ESI Highly Cited Paper
- **Integrated Translomics with Proteomics to Identify Novel Iron-Transporting Proteins in *Streptococcus pneumoniae***  
*Frontiers in Microbiology*. 2016, 7:78  
 · XY Yang, K He, G Du, X Wu, G Yu, Y Pan, G Zhang\*, X Sun\*, QY He\*

2018

2017

2016



The *ggtree* (Yu et al. 2017) paper was selected as a feature article to celebrate the 10<sup>th</sup> anniversary of the launch of *Methods in Ecology and Evolution*.

- **Genetic characterization of highly pathogenic H5 influenza viruses from poultry in Taiwan, 2015**  
*Infection, Genetics and Evolution*. 2016, 38:96-100  
· PY Huang, CCD Lee, CH Yip, CL Cheung, G Yu, TTY Lam, DK Smith, H Zhu\*, Y Guan\*
- 2015
- **ChIPseeker: an R/Bioconductor package for ChIP peak annotation, comparision and visualization**  
*Bioinformatics*. 2015, 31(14):2382-2383  
· G Yu\*, LG Wang, QY He\*  
· 🏆 ESI Highly Cited Paper
- **DOSE: an R/Bioconductor package for Disease Ontology Semantic and Enrichment analysis**  
*Bioinformatics*. 2015, 31(4):608-609  
· G Yu\*, LG Wang, GR Yan, QY He\*  
· 🏆 ESI Highly Cited Paper
- **ACK1 Promotes Gastric Cancer Epithelial-Mesenchymal Transition and Metastasis through AKT-POU2F1-ECD Signaling**  
*Journal of Pathology*. 2015, 236(2):175-185  
· SH Xu, JZ Huang, ML Xu, G Yu, XF Yin, D Chen\*, GR Yan\*
- **Proteomic analysis on the copper resistance of *Streptococcus pneumoniae***  
*Metalomics*. 2015, 7(3):448-454  
· Z Guo, J Han, XY Yang, K Cao, K He, G Du, G Zeng, L Zhang, G Yu, Z Sun, QY He\*, X Sun\*
- **Proteomic analysis on the antibacterial activity of a Ru(II) complex against *Streptococcus pneumoniae***  
*Journal of Proteomics*. 2015, 115:107-116  
· XY Yang, L Zhang, J Liu, N Li, G Yu, K Cao, J Han, G Zeng, Y Pan, X Sun\*, QY He\*
- 2014
- **Proteomic analysis of putative heme-binding proteins in *Streptococcus pyogenes***  
*Metalomics*. 2014, 6(8):1451-1459  
· N Wang#, J Zhang#, L Zhang, XY Yang, N Li, G Yu, J Han, K Cao, Z Guo, X Sun\*, QY He\*
- 2013
- **Putative cobalt- and nickel-binding proteins and motifs in *Streptococcus pneumoniae***  
*Metalomics*. 2013, 5(7):928-935  
· X Sun#, G Yu#, Q Xu, N Li, C Xiao, X Yin, K Cao, J Han, QY He\*

- **A novel andrographolide derivative AL-1 exerts its cytotoxicity on K562 cells through a ROS-dependent mechanism**  
*Proteomics*, 2013, 13(1):169-178  
 · YY Zhu<sup>#</sup>, G Yu<sup>#</sup>, Y Zhang, Z Xu, YQ Huang, GR Yan<sup>\*</sup>, QY He<sup>\*</sup>
- **A DNA-Based Semantic Fusion Model for Remote Sensing Data**  
*PLoS One*. 2013, 8(10):e77090  
 · H Sun<sup>\*</sup>, J Weng, G Yu, RH Massawe
- **Quantitative Proteomics Characterization on the Anti-tumor Effects of Isodexyelephantopin against Nasopharyngeal Carcinoma**  
*Proteomics*. 2013, 13(21):3222-3232  
 · GR Yan<sup>#</sup>, Z Tan<sup>#</sup>, Y Wang, ML Xu, G Yu, Y Li<sup>\*</sup>, QY He<sup>\*</sup>
- **Design, SAR, angiogenic activities evaluation and pro-angiogenic mechanism of new marine cyclopeptide analogs**  
*Current Medicinal Chemistry*. 2013, 20(9):1183-1194  
 · J Li, X Lu, Q Wu, G Yu, Z Xu, L Qiu, Z Pei, Y Lin, J Pang<sup>\*</sup>
- **Proteomic investigation of the interactome of FMNL1 in hematopoietic cells unveils a role in calcium-dependent membrane plasticity**  
*Journal of Proteomics*. 2013, 78:72-82  
 · Y Han, G Yu, H Sarioglu, A Caballero-Martinez, F Schlott, M Ueffing, H Haase, C Peschel, AM Krackhardt<sup>\*</sup>
- **LXtoo: an integrated live Linux distribution for the bioinformatics community**  
*BMC Research Notes*. 2012, 5(1):360  
 · G Yu<sup>#</sup>, LG Wang<sup>#</sup>, XH Meng, QY He<sup>\*</sup>
- **clusterProfiler: an R package for comparing biological themes among gene clusters**  
*OMICS: A Journal of Integrative Biology*. 2012, 16(5):284-287  
 · G Yu, LG Wang, Y Han, QY He<sup>\*</sup>  
 · 🏆 ESI Highly Cited Paper
- **Cellular MicroRNA let-7c Inhibits M1 Protein Expression of the H1N1 Influenza A Virus in Infected Human Lung Epithelial Cells**  
*Journal of Cellular and Molecular Medicine*. 2012, 16(10):2539-2546  
 · Y Ma<sup>#</sup>, J Yang<sup>#</sup>, X Fan<sup>#</sup>, H Zhao, W Hu, Z Li, G Yu, X Ding, J Wang, X Bo, X Zheng, Z Zhou<sup>\*</sup>, S Wang<sup>\*</sup>
- **Genistein-induced mitotic arrest of gastric cancer cells by downregulating KIF20A, a proteomics study**  
*Proteomics*. 2012, 12(14):2391-2399  
 · GR Yan<sup>#</sup>, FY Zhou<sup>#</sup>, BL Dang, Y Zhang, G Yu, X Liu, QY He<sup>\*</sup>

2012



clusterProfiler (Yu et al. 2012) 被中国科学技术信息研究所列为“2011-2021我国高被引论文中被引次数最高的10篇国际论文” (2021年中国科技论文统计报告 )

- 2011
- **Functional similarity analysis of human virus-encoded miRNAs**  
*Journal of Clinical Bioinformatics*. 2011, 1(1):15  
· G Yu, QY He\*
  - **A new method for measuring functional similarity of microRNAs**  
*Journal of Integrated OMICS*. 2011, 1(1):49-54  
· G Yu#, CL Xiao#, X Bo, CH Lu, Y Qin, S Zhan, QY He\*
  - **Phosphoproteome profile of human lung cancer cell line A549**  
*Molecular BioSystems*. 2011, 7(2):472-479  
· G Yu#, CL Xiao#, CH Lu#, HT Jia, F Ge, W Wang, XF Yin, HL Jia, JX He\*, QY He\*
  - **Proteomic Analysis of Membrane Proteins from *Streptococcus pneumoniae* with Multiple Separation Methods plus High Accuracy Mass Spectrometry**  
*OMICS: A Journal of Integrative Biology*. 2011, 15(10):683-694  
· X Sun#, XY Yang#, XF Yin, G Yu, CL Xiao, X He, QY He\*
- 2010
- **GOSemSim: an R package for measuring semantic similarity among GO terms and gene products**  
*Bioinformatics*. 2010, 26(7):976-978  
· G Yu#, F Li#, Y Qin, X Bo\*, Y Wu, S Wang\*  
· 🏆 ESI Highly Cited Paper
- 2009
- **结合基因组分析预测炎症相关miRNA及其靶标**  
*军事医学科学院院刊*. 2009, 33(3):245-247  
· 余光创, 王超, 许尹, 伯晓晨, 王升启\*, 秦宜德\*
- 2007
- **依赖于5'端非编码区高级结构的真核生物mRNA翻译调控**  
*中国生物化学与分子生物学报*. 2007, 23(11):881-887  
· 余光创, 秦宜德, 伯晓晨, 王升启\*

## CONFERENCE PROCEEDINGS

- 2021
- **clusterProfiler 4.0: A universal enrichment tool for interpreting omics data**  
The 7<sup>th</sup> National Conference on Computational Biology and Bioinformatics
- 2020
- **Data integration and visualization of phylogenetic trees**  
BioC Asia, Oct 2020  Virtual Conference
- 2019
- **R语言在生物信息学数据可视化中的应用**  
第八届南方医院博士论坛 - 研而有信之修“生”养“信”, Oct 2019  Southern Medical University

- **Data integration and visualization of phylogenetic trees**  
Managing Zoonotic Infections in the era of One Health, Oct 2019  
📍 Guangzhou Medical University
  - **R包开发十条建议**  
第一届生信人才发展论坛  
📍 Zhuhai, CN
  - **Two methods for mapping and visualizing associated data on phylogeny using ggtree**  
第一届南方医科大学基础医学学术年会, Jan 2019  
📍 Southern Medical University
- 2017
- **ggtree for tree visualization & annotation**  
Phylogenetic tree visualization workshop/hackathon, May 2017  
📍 The Field Museum of Natural History
  - **Computational Methods in Ecology and Evolution**  
The Second International Workshop on Environmental Microbiomes, Apr 2017  
📍 Sun Yat-sen University
- 2016
- **R语言与生物信息学**  
潮博沙龙  
📍 Guangzhou, CN
  - **ggtree for visualization and annotation of phylogenetic trees**  
The 9<sup>th</sup> China-R Conference, May 2016  
📍 Renmin University of China
- present | 2022
- ## 🏡 PROFESSIONAL AFFILIATIONS
- **The Innovation**  
Youth Editor
  - **南方医科大学基础医学院第二届学术分委员会**  
委员
- present | 2021
- **中国生物工程学会**  
计算生物学与生物信息学专业委员会委员
- present | 2020
- **广东省精准医学应用学会**  
微生态医学分会常务委员  
📍 Guangdong, CN
  - **广东省医学会**  
医学遗传学分会青年委员会副主任委员  
📍 Guangdong, CN
- present | 2019
- **中国计算机学会**  
会员

- present | 2017 香港大学校友会 会员
- present | 2014 广东潮博智库 专家  Guangdong, CN
- 2016 International Society for Influenza and other Respiratory Virus Disease Member
- 2015 International Network for Data Analysis Steering Committee  Institut Pasteur