

Cell Research



Volume 32 Number 12 December 2022

www.nature.com/cr
www.cell-research.com



A proteogenomic landscape of pituitary neuroendocrine tumors
Development of a variant-proof SARS-CoV-2 vaccine
Intercellular transfer of activated STING promotes antitumor immunity
Targeting UHRF1-SAP30-MXD4 axis for leukemia treatment

ISSN 1001-0602



Center for Excellence in Molecular Cell Science
Chinese Academy of Sciences



SPRINGER NATURE

(Founded in 1990)

Online submission via:

<http://www.nature.com/cr>

<http://www.cell-research.com>

Cell Research is published monthly by Nature Publishing Group (NPG) in partnership with Center for Excellence in Molecular Cell Science (CEMCS), Chinese Academy of Sciences (CAS) since 2006.

Sponsored by:

Center for Excellence in Molecular Cell Science (CEMCS), CAS

© 2022 CEMCS, CAS



Affiliated with:

The Chinese Society for Cell Biology since August 2007



Granted by:

Publishing Foundation of Chinese Academy of Sciences, National Natural Science Foundation of China, and China Association for Science and Technology



Supported by SPFCAS

This journal is a member of, and subscribes to the principles of, the Committee on Publication Ethics (COPE) www.publicationethics.org



SPRINGER NATURE

Coordinating Editor for this issue
Fangfang Hu

EDITORIAL

1035 Sanofi-Cell Research outstanding paper award of 2021

Cell Research Editorial Team

RESEARCH HIGHLIGHTS

1036 Off-the-shelf CAR T cells to treat cancer

Sofia Castelli, Regina M. Young, Carl H. June

1038 Sustaining plant immunity in rising temperature

Jian Hua, Xinnian Dong

1040 The scent of a microbe: how host viral infection increases mosquito attraction

Tamia A. Harris-Tryon

1042 Live cold to grow old? Thermogenesis to fight cancer

Henning T. Langer, Lewis C. Cantley, Marcus D. Goncalves

1044 A type III-E CRISPR Caspase exhibiting RNase and protease activities

Hui Yang, Dinshaw J. Patel

ARTICLES

1047 Integrated proteogenomic characterization across major histological types of pituitary neuroendocrine tumors *Open*

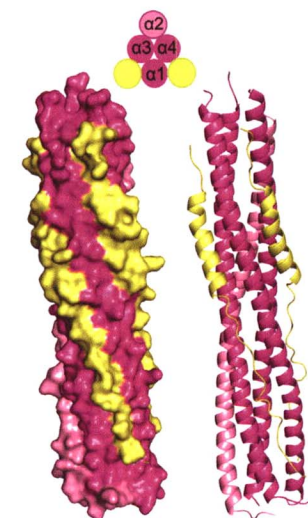
Fan Zhang, Qilin Zhang, Jiajun Zhu, Boyuan Yao, Chi Ma, Nidan Qiao, Shiman He, Zhao Ye, Yunzhi Wang, Rui Han, Jinwen Feng, Yongfei Wang, Zhaoyu Qin, Zengyi Ma, Kai Li, Yichao Zhang, Sha Tian, Zhengyuan Chen, Subei Tan, Yue Wu, Peng Ran, Ye Wang, Chen Ding, Yao Zhao

1068 A variant-proof SARS-CoV-2 vaccine targeting HR1 domain in S2 subunit of spike protein *Open*

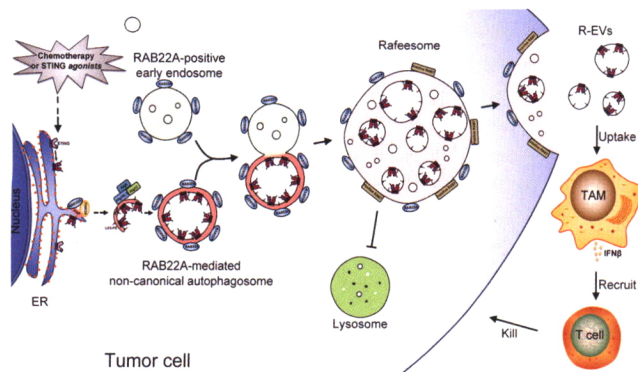
Wei Pang, Ying Lu, Yan-Bo Zhao, Fan Shen, Chang-Fa Fan, Qian Wang, Wen-Qiang He, Xiao-Yan He, Ze-Kai Li, Tao-Tao Chen, Cui-Xian Yang, You-Zhi Li, Si-Xuan Xiao, Zu-Jiang Zhao, Xu-Sheng Huang, Rong-Hua Luo, Liu-Meng Yang, Mi Zhang, Xing-Qi Dong, Ming-Hua Li, Xiao-Li Feng, Qing-Cui Zhou, Wang Qu, Shibo Jiang, Songying Ouyang, Yong-Tang Zheng



Cover: A proteogenomic study reclassified pituitary neuroendocrine tumors into seven subtypes. Each subtype has specific potential treatment targets, which is summarized as the tree in the image. This new, treatment-oriented classification represents a breakthrough for selecting appropriate therapeutic interventions for this highly heterogeneous disease. See page 1047–1067 by Fan Zhang et al. for details.



Surface and cartoon representation of the atomic model of HR121 dimer. HR121 dimer consists of four HR1 ($\alpha 1$ – $\alpha 4$) and two HR2. See page 1068–1085 by Wei Pang et al. for details.



A model proposed for the intercellular transfer of activated STING conferring antitumor immunity. See page 1086–1104 by Ying Gao et al. for details.

Zhu Chen, Sai-Juan Chen, Xiaolong Liu, Xiao-Jian Sun, Mingyue Zheng, Lan Wang

LETTERS TO THE EDITOR

1124 AI-empowered integrative structural characterization of m⁶A methyltransferase complex *Open*

Xuhui Yan, Kai Pei, Zeyuan Guan, Feiqing Liu, Junjun Yan, Xiaohuan Jin, Qiang Wang, Mengjun Hou, Chun Tang, Ping Yin

1128 Cryo-EM structure of the type III-E CRISPR-Cas effector gRAMP in complex with TPR-CHAT

Shuo Wang, Minghui Guo, Yuwei Zhu, Zhiying Lin, Zhiwei Huang

CORRECTIONS

1132 Author Correction: Gut microbiota drives macrophage-dependent self-renewal of intestinal stem cells via niche enteric serotonergic neurons

Pingping Zhu, Tiankun Lu, Jiayi Wu, Dongdong Fan, Benyu Liu, Xiaoxiao Zhu, Hui Guo, Ying Du, Feng Liu, Yong Tian, Zusen Fan

1133 Correction: CRISPR FISHer enables high-sensitivity imaging of nonrepetitive DNA in living cells through phase separation-mediated signal amplification *Open*

Xin-Yuan Lyu, Yuan Deng, Xiao-Yan Huang, Zhen-Zhen Li, Guo-Qing Fang, Dong Yang, Feng-Liu Wang, Wang Kang, En-Zhi Shen, Chun-Qing Song

INDEX

1134 Content index

1086 Intercellular transfer of activated STING triggered by RAB22A-mediated non-canonical autophagy promotes antitumor immunity *Open*

Ying Gao, Xueping Zheng, Boyang Chang, Yujie Lin, Xiaodan Huang, Wen Wang, Shirong Ding, Weixiang Zhan, Shang Wang, Beibei Xiao, Lanqing Huo, Youhui Yu, Yilin Chen, Run Gong, Yuanzhong Wu, Ruhua Zhang, Li Zhong, Xin Wang, Qiuyan Chen, Song Gao, Zhengfan Jiang, Denghui Wei, Tiebang Kang

1105 Targeting UHRF1-SAP30-MXD4 axis for leukemia initiating cell eradication in myeloid leukemia *Open*

Cheng-Long Hu, Bing-Yi Chen, Zijuan Li, Tianbiao Yang, Chun-Hui Xu, Ruirui Yang, Peng-Cheng Yu, Jingyao Zhao, Ting Liu, Na Liu, Bin Shan, Qunling Zhang, Junhong Song, Ming-Yue Fei, Li-Juan Zong, Jia-Ying Zhang, Ji-Chuan Wu, Shu-Bei Chen, Yong Wang, Binhe Chang, Dan Hou, Ping Liu, Yilun Jiang, Xiya Li, Xinchu Chen, Chu-Han Deng, Yi-Yi Ren, Roujia Wang, Jiacheng Jin, Kai Xue, Ying Zhang, Meirong Du, Jun Shi, Ling-Yun Wu, Chun-Kang Chang, Shuhong Shen,

ADVANCE ONLINE PUBLICATION

LilrB3 is a putative cell surface receptor of APOE4 *Open*

Jiayao Zhou, Yumeng Wang, Gaoxingyu Huang, Min Yang, Yumin Zhu, Chen Jin, Dan Jing, Kai Ji and Yigong Shi

Cell Discovery

Making publication fun for you

Cell Discovery is an open access international journal that publishes results of high significance and broad interest in all areas of molecular and cell biology. *Cell Discovery* is established in 2015 as a sister journal of *Cell Research*, a top-tier journal with a current impact factor of 46.297. The new impact factor of *Cell Discovery* is 38.079 (Clarivate Analytics, 2022), the current acceptance standard of *Cell Discovery* is comparable to the sister journals of *Cell/Nature/Science*.

Authors benefit from:

- Open Access Publication - anyone can download and read your paper
- Wide exposure to a large global audience on nature.com
- Internationally renowned editors and editorial board
- Quality peer-review and fast publication
- Indexed in Scopus and PubMed Central (PMC)
- Science Citation Index Expanded (SciSearch®), Journal Citation Reports/Science Edition

Featured articles

Novel cleavage sites identified in SARS-CoV-2 spike protein reveal mechanism for cathepsin L-facilitated viral infection and treatment strategies
Cell Discov. 2022 Jun 6;8(1):53. doi: 10.1038/s41421-022-00419-w.

Dynamic O-GlcNAcylation coordinates ferritinophagy and mitophagy to activate ferroptosis
Cell Discov. 2022 May 3;8(1):40. doi: 10.1038/s41421-022-00390-6.

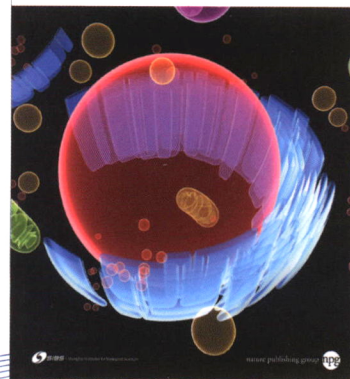
Treatment of SARS-CoV-2-induced pneumonia with NAD⁺ and NMN in two mouse models
Cell Discov. 2022 Apr 29;8(1):38. doi: 10.1038/s41421-022-00409-y.

CRISPR signal conductor 2.0 for redirecting cellular information flow
Cell Discov. 2022 Mar 15;8(1):26. doi: 10.1038/s41421-021-00371-1.

Cross-species metabolomic analysis identifies uridine as a potent regeneration promoting factor
Cell Discov. 2022 Feb 1;8(1):6. doi: 10.1038/s41421-021-00361-3.

Histone lysine methacrylation is a dynamic post-translational modification regulated by HAT1 and SIRT2
Cell Discov. 2021 Dec 28;7(1):122. doi: 10.1038/s41421-021-00344-4.

Cell Discovery



Editor-in-Chief: Dangsheng Li

SUBMIT

Visit www.nature.com/celldisc/
to read the Published Papers and Submit Today!