

FMD 代谢干预联合CTLA-4PD-1PD-L1阻断疗法治疗肿瘤：作用机制与治疗策略

作者：writer 来源：科学网

本文原地址：<https://www.iikx.com/news/progress/32829.html>

本文仅供学习交流之用，版权归原作者所有，请勿用于商业用途！

FMD

代谢干预联合CTLA-4PD-1PD-L1阻断疗法治疗肿瘤：作用机制与治疗策略。 论文标题：Metabolic interventions combined with CTLA-4 and PD-1/PD-L1 blockade for the treatment of tumors: mechanisms and strategies

期刊：Frontiers of Medicine

作者：Liming Liao, Huilin Xu, Yuhan Zhao, Xiaofeng Zheng

发表时间：15 Oct 2023

DOI：10.1007/s11684-023-1025-7

微信链接：[点击此处阅读微信文章](#)

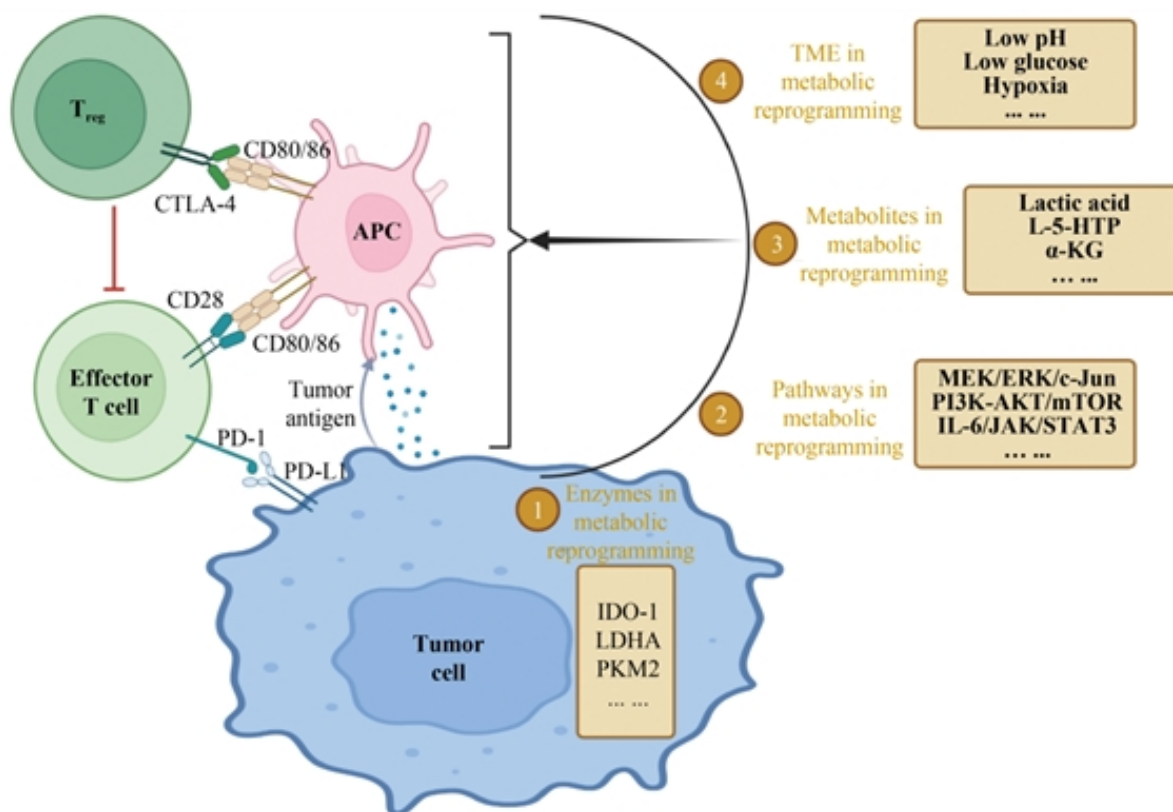
导读

北京大学郑晓峰团队在Frontiers of Medicine发表综述论文《代谢干预联合CTLA-4/PD-1/PD-L1阻断疗法治疗肿瘤：作用机制与治疗策略》（Metabolic interventions combined with CTLA-4 and PD-1/PD-L1 blockade for the treatment of tumors: mechanisms and strategies）。本文探讨了肿瘤代谢重编程与免疫检查点分子之间的相互作用机制，提出了通过靶向代谢通路联合免疫检查点阻断治疗的策略，旨在克服肿瘤免疫逃逸和增强抗肿瘤免疫应答，为优化癌症免疫治疗提供了理论依据和潜在临床转化方向。

Immunotherapies based on immune checkpoint blockade (ICB) have significantly improved patient outcomes and offered new approaches to cancer therapy over the past decade. To date, immune checkpoint inhibitors (ICIs) of CTLA-4 and PD-1/PD-L1 represent the main class of immunotherapy. Blockade of CTLA-4 and PD-1/PD-L1 has shown remarkable efficacy in several specific types of cancers, however, a large subset of refractory patients presents poor responsiveness to ICB therapy; and the underlying mechanism remains elusive. Recently, numerous studies have revealed that metabolic reprogramming of tumor cells restrains immune responses by remodeling the tumor microenvironment (TME) with various products of metabolism, and combination therapies involving metabolic inhibitors and ICIs provide new

approaches to cancer therapy. Nevertheless, a systematic summary is lacking regarding the manner by which different targetable metabolic pathways regulate immune checkpoints to overcome ICI resistance. Here, we demonstrate the generalized mechanism of targeting cancer metabolism at three crucial immune checkpoints (CTLA-4, PD-1, and PD-L1) to influence ICB therapy and propose potential combined immunotherapeutic strategies co-targeting tumor metabolic pathways and immune checkpoints.

在过去十年中，基于免疫检查点阻断（ICB）的免疫疗法显著改善了患者的预后，并为癌症治疗提供了新的途径。目前，细胞毒性T淋巴细胞相关抗原4（CTLA-4）以及程序性死亡受体1/配体1（PD-1/PD-L1）的免疫检查点抑制剂（ICIs）是免疫疗法的主要类别。CTLA-4与PD-1/PD-L1阻断疗法在部分实体瘤中已显示出显著疗效，然而，有很大一部分难治性患者对免疫检查点阻断疗法的反应不佳，且其潜在机制尚未完全阐明。最新研究表明，肿瘤细胞通过代谢重编程利用各种代谢产物重塑肿瘤微环境（TME）来抑制免疫应答，而涉及代谢抑制剂和免疫检查点抑制剂的联合疗法为癌症治疗提供了新的途径。尽管如此，关于靶向干预不同代谢通路调控免疫检查点表达以克服ICI耐药的系统性机制，仍缺乏系统性的总结。本文系统阐述了在三个关键免疫检查点（CTLA-4、PD-1与PD-L1）靶向癌症代谢以影响免疫检查点阻断疗法的普遍机制，并提出了联合靶向肿瘤代谢途径和免疫检查点的潜在联合免疫治疗策略。



期刊介绍

Frontiers of Medicine专注于发表临床医学和基础医学领域的最新研究成果，旨在通过全球医疗专业人员之间的交流促进健康和医疗保健的发展。该刊采用严格的同行评审和编辑流程，确保发表的文章的科学准确性、新颖性和重要性。

原文信息

标题

Metabolic interventions combined with CTLA-4 and PD-1/PD-L1 blockade for the treatment of tumors: mechanisms and strategies

作者

Liming Liao, Huilin Xu, Yuhan Zhao, Xiaofeng Zheng

机构

State Key Laboratory of Protein and Plant Gene Research, Department of Biochemistry and Molecular Biology, School of Life Sciences, Peking University, Beijing 100871, China

通讯作者

Xiaofeng Zheng

引用这篇文章

Liming Liao, Huilin Xu, Yuhan Zhao, Xiaofeng Zheng. Metabolic interventions combined with CTLA-4 and PD-1/PD-L1 blockade for the treatment of tumors: mechanisms and strategies. *Front. Med.*, 2023, 17(5): 805 – 822 <https://doi.org/10.1007/s11684-023-1025-7>

<https://journal.hep.com.cn/fmd/EN/10.1007/s11684-023-1025-7>

<https://link.springer.com/article/10.1007/s11684-023-1025-7>

感谢作者对Frontiers of Medicine的信任和支持。



《前沿》系列英文学术期刊

由教育部主管、高等教育出版社主办的《前沿》（Frontiers）系列英文学术期刊，于2006年正式创刊，以网络版和印刷版向全球发行。系列期刊包括基础科学、生命科学、工程技术和人文社会科学四个主题，是我国覆盖学科最广泛的英文学术期刊群，其中12种被SCI收录，其他也被AHCI、Ei、MEDLINE或相应学科国际权威检索系统收录，具有一定的国际学术影响力。系列期刊采用在线优先出版方式，保证文章以最快速度发表。

中国学术前沿期刊网

<http://journal.hep.com.cn>



特别声明：本文转载仅仅是出于传播信息的需要，并不意味着代表本网站观点或证实其内容的真实性；如其他媒体、网站或个人从本网站转载使用，须保留本网站注明的“来源”，并自负版权等法律责任；作者如果不希望被转载或者联系转载稿费事宜，请与我们联系。

来源：Frontiers of Medicine

更多 科学进展 请访问 <https://www.iikx.com/news/progress/>

本文版权归原作者所有，请勿用于商业用途，[爱科学iikx.com](http://www.iikx.com)转发