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EDITORIAL

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Revisiting and proposing the most important questions in cancer research and clinical oncology

Chao-Nan Qian[1,*], Francesco Pezzella[2], and Zhimin Lu[3]

[1] Department of Radiation Oncology, Guangzhou Concord Cancer Center, 9 Ciji Road, Guangzhou, Guangdong 510555, China
[2] Nuffield Division of Clinical Laboratory Science, Radcliffe Department of Medicine, Level 4, Academic Block, John Radcliffe Hospital, University of Oxford, Headley Way, Headington, Oxford OX3 9DU, UK
[3] Zhejiang Provincial Key Laboratory of Pancreatic Disease, The First Affiliated Hospital, Institute of Translational Medicine, Zhejiang University School of Medicine, Zhejiang University, 268 Kai-Xuan Road, Hangzhou, Zhejiang 310029, China

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Abstract – Given the limitations in our understanding of cancer development and treatment options, malignant neoplasms remain a leading cause of death worldwide. In 2016, to bolster our fight against cancer, we invited authors globally to identify the most crucial questions in cancer research and clinical oncology. This effort led to the review and publication of 101 key scientific questions, sparking a surge in promising research across various domains. With the significant growth in our knowledge and evidence over the past decade, we are excited to invite authors to revisit and refine their previously published key questions. We also encourage the submission of new key questions related to malignant diseases. The deadline for submitting these impactful questions is extended to the end of 2025.

Key words: Cancer biology, Clinical oncology, Metastasis, Immunology, Radiotherapy.

With the dramatic development of medical sciences and technologies for cancer prevention, detection, and treatment, the incidence rates of several malignancies have declined and the cure rate for some cancers has significantly increased in certain areas of the world. However, cancer-related death is still a major cause of mortality worldwide, killing nearly 10 million patients in 2020 [1], suggesting the limitations of our understanding on carcinogenesis, cancer biology, as well as medical interventional options.

Hoping to promote basic research and clinical investigations, we launched an interesting activity in 2016 by inviting authors worldwide to present the most important questions in cancer research and clinical oncology [2]. The initial plan was to publish 150 key questions to tribute to Dr. Sun Yat-sen for his 150th year anniversary of birth, who was a physician and a pioneer in the modernization of China. By 2018, 101 most important questions have been peer-reviewed and published [3–15]. These key questions have triggered significant interest in the research fields of cancer etiology [16–19], epidemiology [20, 21], metabolism [22, 23], apoptosis [24], senescence [25], angiogenesis [26, 27], cachexia [28, 29], immunology [30–32], treatment resistance [30, 33], and novel therapeutic modality [34–37]. In Figure 1, we present the distribution of the questions categorized into broad topics, some predominantly clinical and others more biological. Interestingly, while the number of biological topics is higher, it is the clinical topics that contain more questions. Specifically, the groups with the most questions pertain to issues related to chemotherapy, radiotherapy, or immunotherapy.

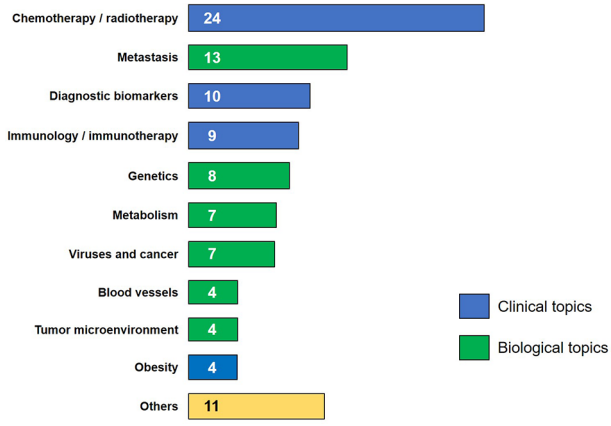

Figure 1. A horizontal bar chart of the previously published 101 most important questions in cancer research and clinical oncology summarized by category. The number of questions for each category is presented. Notably, a balance between clinical and biological topics can be appreciated. With metastasis remaining the most challenging issue in cancer treatment and prevention, more key questions in this area are expected in future publications.

*Corresponding author: chaonan.qian@ccm.cn

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The rapid accumulation of multidisciplinary data and knowledge has significantly advanced our understanding of cancer biology and therapeutic approaches. Therefore, the key questions published 6–8 years ago may require revisiting and potentially revising. For instance, our limited number of questions on the tumor microenvironment (TME) (only four) underscores the need for further exploration of this critical area. The TME's profound impact on cancer progression and treatment responses necessitates a more comprehensive understanding. Additionally, a paucity of questions regarding single-cell sequencing and multi-omics data analysis suggests an opportunity for deeper investigation in these promising avenues. Formulating novel and thought-provoking questions on these topics holds immense potential to enrich our understanding of cancer.

Building upon the valuable platform of Visualized Cancer Medicine (VCM), we are excited to invite authors to revisit and refine their previously published key questions. We also warmly welcome the submission of novel key questions for peer review and potential publication in VCM. By revisiting and refining existing key questions, while also introducing novel ones, this initiative aims to reframe and revitalize cancer research, ultimately accelerating progress in the fight against this complex disease.

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