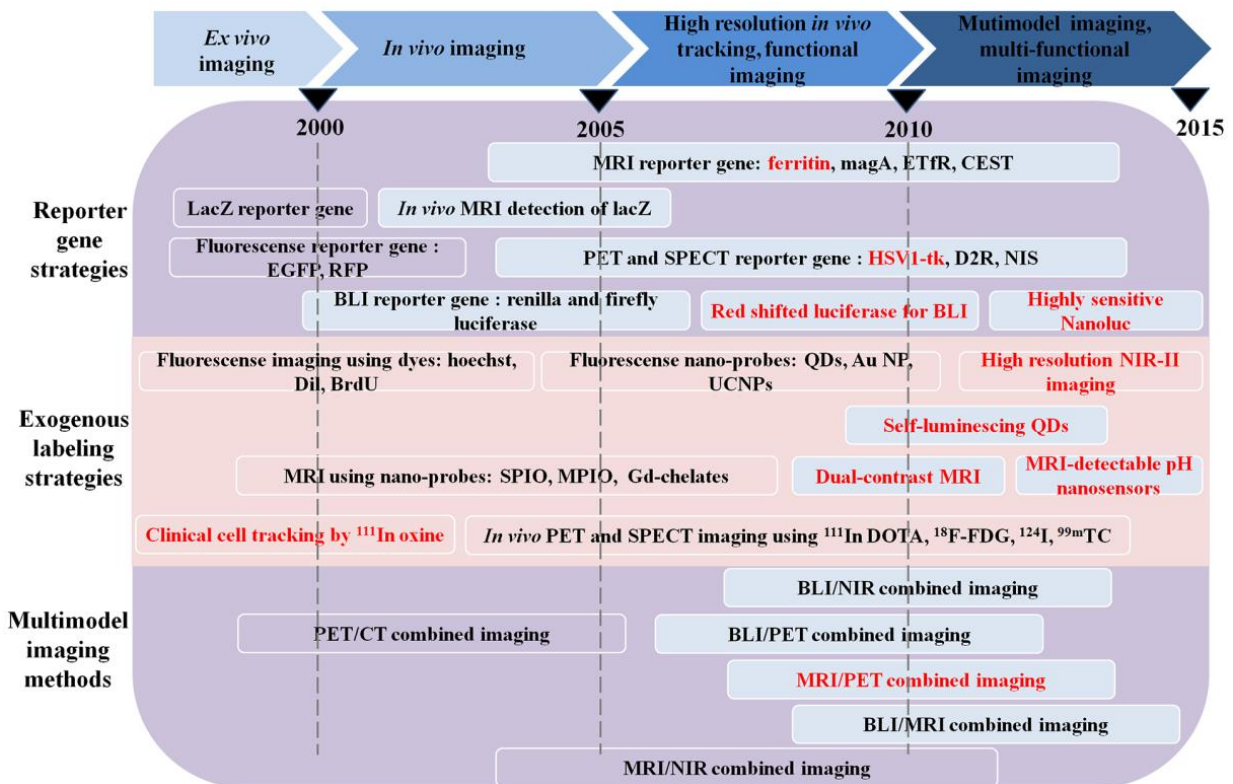


Recent progress in tracking the viability of transplanted stem cells in vivo

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The recent progress in the development of tracking the viability of in vivo stem cell tracking methodologies. Credit: ©Science China Press

Noninvasive cell-tracking methods are indispensable for assessing the safety and efficacy of stem-cell based therapy. Thus, the research of noninvasive cell-tracking methods for determining in vivo the

translocation and long-term viability of the transplanted stem cells have received considerable attention. A recent review article summarized the recent progress in tracking the viability of the transplanted stem cells in vivo.

In the article coauthored with S. Lin, G. Chen, D. Huang, C. Meng, and Q. Wang, scholars at Suzhou Institute of Nano-Tech and Nano-Bionics, Chinese Academy of Sciences, and College of Biological Science and Technology, Fuzhou University summarized the current methods for tracking the [viability](#) of the [transplanted stem cells](#) in vivo, including reporter-gene based methods, exogenous contrast label-based methods and multimodel imaging methods.

In recent decades, stem cell-based regenerative medicine has attracted intense attention and extraordinary expectation due to its potentials in the treatment of numerous major diseases, such as hepatic, cardiac, pulmonary, renal and neurological diseases.

Knowing the viability, distribution and differentiation of the transplanted stem cells in vivo is a prerequisite for better understanding the role of stem cells playing in the therapeutic process, in which the survival report of the transplanted stem cells in vivo is particularly crucial in determining the success of stem cell-based regenerative medicine. Therefore, the development of non-invasive imaging methods that can monitor the viability of the transplanted stem cells in situ is urgently needed.

In this article, the authors summarized the development history of stem cell-tracking imaging techniques, explained the imaging principles, pros and cons underlying these techniques, and provided an overview of the applications of these techniques in animal models or humans. Furthermore, this review provided a guideline for researchers to select the right tracking method for the right study. Finally, this review

discussed the current challenges in tracking the viability of transplanted [stem cells](#), and emphasized the promise of the combined NIR-II fluorescence imaging/BLI method and MRI/PET method for further applications in high-throughput cell therapy screening in animal models and safe imaging in clinical trials, respectively.

More information: SuYing LIN et al. Progress of tracking the viability of transplanted stem cells, *Chinese Science Bulletin (Chinese Version)* (2016). [DOI: 10.1360/N972015-01404](https://doi.org/10.1360/N972015-01404)

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