In vivo imaging is the non-invasive visualization of living organisms for research or diagnostic purposes.

It is crucial and clinically relevant to clarify the homing efficiency and retention of stem cells in different implanting strategies of cell therapy for various injuries. However, the need for a tool for investigating the mechanisms is still unmet. Tang et al. introduced multi-modal BaGdF5:Yb, Tm nanoparticles as a nanoprobe to label adipose-derived stem cells (ADSCs) and detect the homing behavior with micro-computed tomography (micro-CT) imaging technique. The migration of cells injected locally or intravenously, with or without a chemokine, CXCL12, was compared. Higher homing efficiency of ADSCs was observed in both intravenously injected groups, in contrast to the low efficiency of cell retention in local implantation. Meanwhile, CXCL 12 promoted the homing of ADSCs, especially in the intravenous route. Nonetheless, the administration of CXCL 12 showed its therapeutic efficacy, whereas intravenous injection of ADSCs almost did not. The work provided a tool for in vivo imaging of the behavior of implanted cells in preclinical studies of cell therapy, and more importantly, implied that the parameters for implanting stem cells in clinical operation should be carefully considered [1)].

1)
Tang N, Wang X, Zhu J, Sun K, Li S, Tao K. Labelling stem cells with a nanoprobe for evaluating the homing behaviour in facial nerve injury repair. Biomater Sci. 2022 Jan 6. doi: 10.1039/d1bm01823j. Epub ahead of print. PMID: 34989358.

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