Department of Anesthesia, Critical Care and Pain Medicine

Research

RESEARCH UPDATE

Dr. Joji Fujisaki published in *Nature*

Joji Fujisaki, MD, PhD senior authored a paper in the prestigious journal *Nature*, "Bone marrow niches orchestrate stem-cell hierarchy and immune tolerance" that has important implications for cancer treatment. See Dr. Fujisaki's explanation below plus a link to the complete article. Vice Chair of Research, Dr. Simon Robson, was a co-author on the article:

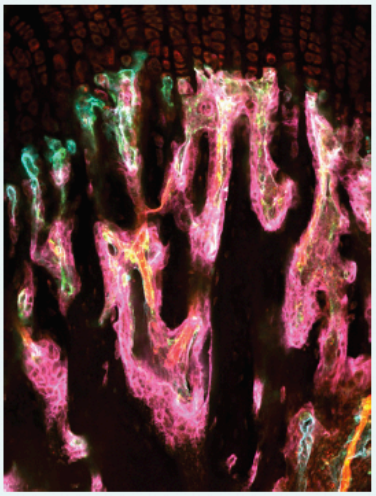
"This new work in the area of "stem immunology" provides fundamental insights into stem cell hierarchy, addresses controversies regarding the nature of the bone marrow (BM) niche, and demonstrates mechanisms underpinning immune tolerance for stem cells. The data suggest that the niche may orchestrate stem cell hierarchy with immune tolerance. Most importantly, this study also makes a broad impact on clinical medicine in various settings.

Firstly, the study demonstrates new mechanisms that boost the transplantation of HLA-mismatched blood stem cells. Immunoprotective BM niches shield such donor blood stem cells from immune attack and facilitate engraftment. Therefore, modulation of the immune-privileged stem cells and their associated niches may illuminate new approaches in stem cell transplantation.

Secondly, the study identifies NOHi HSCs and capillaries as promising sources of cell therapy for transplantation. This work demonstrates, following transplantation into allogeneic HLA-mismatched mice, highly immune-privileged NOHi HSCs engraft to a far greater extent than less immune-privileged NOLow HSCs. Transfer of immunoprotective capillary cells improves the engraftment of transplanted allogeneic HSCs.

Third, this study raises the novel possibility that highly immunoprotective niches shield cancer stem cells from immune attack and immunotherapy. Disruption of these immunological sanctuaries for stem cells may be useful to expose cancer stem cells to immunotherapy and overcome therapeutic resistance in cancer.

This novel work not only makes fundamental discoveries into the biology of stem cells and immune tolerance but also defines novel avenues for new immunotherapeutic targets to enhance stem cell transplantation and possibly improve tumor immunotherapy."



The image shows distinctive capillaries within the bone marrow that create specialized, highly immunoprotective microenvironments, sequestering and protecting stem cells. These somatic "pillars of creation" shield transplanted stem cells from immune attack and contribute to successful outcomes following transplantation.

Clinic on the link below to view the entire article: https://rdcu.be/d5n7o