REGEN

Invitra CBSC: A Synergistic Approach

Invitra CBSC™ is an umbilical cord blood derived stem cell product. The product consists of a heterogenous cord blood stem cell (CBSC) population that includes hematopoietic stem cells (HSC), and mesenchymal stems cells (MSC).[1]These stem cells have the capacity to self-renewal, release growth factors and cytokines, as well as differentiate into more mature cells. In addition, some cord blood stem cells express transcription factors normally observed in pluripotent stem cells OCT4, SOX2, and NANOG and embryonic stem cell markers SSEA-3, SSEA-4, TRAI-60, and TRAI-80.[1]

This variety of cells synergistically work towards cellular growth. Mesenchymal stem cells create a microenvironment rich in cytokines and regulatory factors that promotes hematopoiesis.[2] Because of this, CBSC have been used for over twenty years for hematopoietic stem cell reconstitution as a substitution for bone marrow reconstitution.[3] In addition, endothelial progenitor cells (EPCs) are present in cord blood.[2] EPCs enhance angiogenesis and vasculogenesis.

Additionally, due to the high plasticity of umbilical cord cells, there is significantly decreased risk of graft-versus- host disease (GVHD) and if GVHD does occur it is less severe than most other types of transplants.[4,5]

Invitra CBSC™ is made at a concentration of 5 million cells per cc. This concentration has shown efficacy through patient and doctor reported results. A current osteoarthritis study underway has shown reductions in patient reported pain scores as well as doctor evaluated range of motion tests using a one time intra-articular injection. Higher concentration of cells are available as needed.

1. Ali, H., & Al-Mulla, F. (2012). Defining umbilical cord blood stem cells. *Stem Cell Discovery*, *2*(1), 15-23.
2. Cheng, L., Mbalaviele, G., Liu, X., Novelli, E., Vanguri, P., Mosca, J., ... & Thiede, M. A. (1998, November). Human mesenchymal stem cells support proliferation and multilineage differentiation of human hematopoietic stem cells. In *Blood*(Vol. 92, No. 10, pp. 57A-57A). INDEPENDENCE SQUARE WEST CURTIS CENTER, STE 300, PHILADELPHIA, PA 19106-3399 USA: WB SAUNDERS CO.
3. Smith, A. R., & Wagner, J. E. (2009). Alternative haematopoietic stem cell sources for transplantation: place of umbilical cord blood. *British journal of haematology*, *147*(2), 246-261.
4. Kurtzberg, J., Laughlin, M., Graham, M. L., Smith, C., Olson, J. F., Halperin, E. C., ... & Rubinstein, P. (1996). Placental blood as a source of hematopoietic stem cells for transplantation into unrelated recipients. *New England Journal of Medicine*, 335(3), 157-166.
5. Kumar, A., & Kumar, P. (2013). Umbilical cord blood stem cell and its immunoregulatory properties initiative towards clinical application. *J Med Res*, *1*(2), 14-17.
6. Coutts, M., Soriano, R., & Rajendran Naidoo, H. T. (2017). Umbilical cord blood stem cell treatment for a patient with psoriatic arthritis. *World journal of stem cells*, *9*(12), 235.