Cord Blood Perfusion and Collection System

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Technology description

The present invention is a complete system for the collection of stem cells found within the umbilical cord and placenta vasculature. A strategy of the system is the use of perfusion in order to recover a larger yield of residual cells than what is currently recoverable. The invention is composed of three primary components: a hand-held sterile access (SA) component, a portable tray-container, and a perfusion pump device. The SA component clamps onto the umbilical cord at the time of delivery to accurately and sterilely access the vein and arteries for the purposes of perfusing the vasculature. It features novel methods for maintaining a closed sterile environment while introducing perfusate into the venous vasculature and collecting cord blood and perfusate from the arterial vasculature. After establishing sterile vascular access, the placenta and SA component are placed into the trays corresponding cavities. The tray is a holding container which features an integrated dock for receiving the SA component and fluidically connecting the perfusate, collection, and antiseptic rinse bags to the SA component. The tray has a unique inner and outer layer to preserve sterility and cleanliness upon removal from the working area. When closed and removed from its protective outer layer, it also functions as a contained cartridge which is loaded into the perfusion device for processing. Finally, the perfusion device automates the cell capturing process through the use of a peristaltic pump. The pump is enclosed in durable housing and interacts with the single-use components to drive collection. The device features an intuitive user-interface and automated protocols which create an easy and effective collection process.

Institution

Johns Hopkins University

Inventors

Christopher Chiang
CEO

联系我们

叶先生

电 话：021-65679356

手 机：13414935137

邮 箱：yeyingsheng@zf-ym.com