In November of 2009, the St. Louis Cord Blood Bank (SLCBB) adopted the PrepaCyte-CB® method for the manufacture of cord blood units (CBU). This decision was made following an evaluation of alternative processing technologies, including automated methods, against the SLCBB’s historical hematocrit method. The results yielded a trend towrad increased post thaw TNC and CFU recoveries with the PrepaCyte-CB® method.

In the 17 months that have elapsed since the adoption of the PrepaCyte-CB® method, post-processing product characteristics and potency measures have been constantly acceptable. Furthermore, the decrease in hematocrit of the final product has been remarkably (0.7% to 0.2%) without compromising TNC recovery. To further the evaluation of this new processing reagent, the SLCBB has been compiling data for PrepaCyte-CB® units used in patient transplant.

A retrospective data analysis was performed to evaluate product safety and potency. Patient outcomes were provided either directly from the transplant center or through the Center for International Blood and Marrow Transplant Research (CIBMTR). Endpoints include probability of and time to neutrophil recovery and adverse events associated with product infusion.

To date, 33 PrepaCyte-CB® CBUs have been shipped by the SLCBB for use in human transplantation. Outcomes data is available for 29 (87.9%) of these transplants. For the units that can be evaluated, all patients (n=9) have achieved neutrophil recovery with a mean time to recovery of 14.2 days. This is an impressive mark for cord blood and is significantly lower than the expected 21 days from the benchmark of 2009.

The SLCBB has processed more than 5,000 cord blood units using the PrepaCyte-CB® method. Under centrifugation, the nucleated blood cells are forced out of the solution and cell-separated into fractions. After sedimentation, WBC rich plasma is expressed into the next bag within the PrepaCyte-CB® reagent (150 mL) contained in bag one which, when mixed with umbilical cord blood, is extremely effective at depleting the RBC fraction at processing, leading to less RBC contamination post-thaw. These control group data is reported in Table 1.

Conclusions
Laboratory evidence has previously shown PrepaCyte-CB® to be effective in recovering the targeted WBC population while reducing incidental red blood cell during cord blood processing. Most compelling about the performance of this reagent is its ability to maintain a high level of potency post thaw as demonstrated by superior recovery of colony forming units. This observation appears to translate to significantly improved engraftment times (10 days from the benchmark of 21 days), potentially reducing length of stay and morbidity/mortality associated with transplantation events.

The St. Louis Cord Blood Bank collects, processes, and distributes high-quality cord blood products for cellular therapy applications. Focusing on the development of effective cures through advancing the science of regenerative medicine therapies. Since 1996, the SLCBB has received over 100,000 donations through our public donor program and have distributed for life saving therapies.