The Honorable Representative Matsui:

1. *As you know, the goals in creating the NCBI were to create a network of high-quality, diverse cord blood units, and to make cord blood units available for research. Can you elaborate on the work that you do to meet those goals?*

   In 1997, I established, with the support of the National Heart Lung and Blood Institute, through the COBLT (Cord Blood Transplantation program), the Carolinas Cord Blood Bank, (CCBB) a public cord blood bank at Duke University Medical Center. Over the years, the bank established standard operating procedures for donor recruitment and screening, cord blood collection, processing, testing, cryopreservation, storage, release, thaw and wash and administration for transplantation; created an electronic-web based cord blood database which interfaces with the NMDP Be the Match Donor Registry, established multiple regional staffed collection sites, established a remote kit donation program, became a member of the National Cord Blood Inventory (NCBI) program, became FACT accredited, CAP accredited and CLIA certified, and obtained a BLA from the FDA. The CCBB has banked over 35,000 high quality unrelated donor cord blood units which are available on the NMDP registry. Over 2500 units have been distributed to patients in need of a donor for hematopoietic stem cell transplantation. In addition, over 6,000 units have been distributed to academic and industry researchers for use in their research. The CCBB has explored innovative and novel approaches to cord blood banking and has developed staffed, hybrid and kit donor collection models. Currently they are exploring an "all collect" model at selected hospitals which aims to change the culture about cord blood collection and increase numbers of units collected for consideration for banking.

   What is your definition of a high quality cord blood unit?

   A high quality cord blood unit is a unit that is collected, processed, cryopreserved, stored and tested using controlled and validated processes and that meets specifications for donor screening, hemoglobinopathy testing, total nucleated cell count (TNCC), viability, viable CD34, colony forming unit (CFU) growth, sterility, and potency testing of an attached segment before release from the bank to the transplant center. The specifications I would propose are listed in the table below.

<u>Specifications of a High Quality Cord Blood Unit</u>

Donor Screening	Negative
Donor Testing	Negative
Hemoglobinopathy Testing	No homozygous
Pre-TNCC x 10^9	≥ 1.5
Viability	≥ 90%
Post-TNCC x 10^9	
Viable CD34 x 10^6	≥ 1.25
CFU Growth	Present
Sterility	Negative
Segment Potency	
ALDH bright cells	≥ 0.1%
CD45 Viability	≥ 40%
CFU	Growth
Segment HLA	Confirmed

In addition, cord blood inventories should represent a diverse spectrum of races and ethnicities of their donors to meet the objective to find the best HLA match and cell dose for each patient in need of a donor for transplantation. As there is an ongoing need for more African American donors, in particular, collection strategies should focus on recruitment of these donors. However, there are some inherent biological challenges in meeting this goal because African American's have lower numbers of circulating cells per volume of blood as compared to Caucasians. In practical terms this means that many more units must be collected from African American donors to obtain a high quality cord blood unit, compared to Caucasian donors. Specifically, 1 in 9 Caucasian units will qualify compared to 1 in 20 African American units. To this end, collection strategies and banking processes should target increased numbers of African American units to maintain diversity of the NCBI inventory. The funding strategies from HRSA should also appropriately fund and enable initiatives to increase African American donors.

2. *What about research – how has data collection through the registry and other activities' led to improved patient outcomes?*

   The Stem Cell Transplant Outcomes Database (SCTOD), contracted to the Center for International Blood and Marrow Transplant Research (CIBMTR), collects outcomes data from all patients undergoing hematopoietic stem cell transplantation (HSCT) in the USA and selected international centers on an ongoing basis. This data is utilized to assess the overall success of HSCT measured as overall and disease-free survival, as well as success of various graft sources and the impact of conditioning regimens, patient age and diagnosis, and other variables commonly used by the transplant community. Information obtained from the CIBMTR is invaluable and essential to assess impacts in change in practice, on patient outcomes. The information from the CIBMTR is also used to model future clinical trials, to benchmark success of new innovations (both academic and industry sponsored) and as data for control groups for phase I/II clinical trials.

   In addition to the outstanding work performed by the CIBMTR, there is exciting clinical research emerging in the past 5 years using cord blood as a cellular/regenerative therapy for patients with injures or degenerative diseases. In our program, we are testing whether cord blood can be used to treat children with hypoxic brain injury at birth, cerebral palsy, congenital hydrocephalus, autism and in adults with acute ischemic stroke. Others are examining whether cord blood infusions can help children with Type I Diabetes, congenital hearing loss, certain congenital eye diseases, and adults after myocardial infarction or with chronic limb ischemia. Our work at Duke has demonstrated a beneficial effect infusing cord blood in children with hypoxic ischemic encephalopathy, cerebral palsy and autism. Results of ongoing studies in children and adults with the conditions mentioned above, are pending. In addition, cord blood expansion technologies are becoming more robust and derivation of specialized cells from cord blood (e.g. induced pluripotent stem cells) and cord tissues (e.g. mesenchymal stromal cells) may provide unique cellular products in the future.