Augmenting Stress-Induced Erythropoiesis

Inventors: Thomas J. Braciale and Taeg S. Kim
Anemia

- Anemia is the inability to generate enough red blood cells to adequately carry oxygen to the body’s tissues.
- Affects 1.62 billion people worldwide.

**Clinical Problem:**
- Over 3 million cases in the US each year
- Current treatments aim to stimulate red blood cell production (erythropoiesis)
Solution: Researchers at the University of Virginia have discovered that engagement of CD24 by treatment with monoclonal antibodies (mAb) to CD24 results in a dramatic transient increase in erythropoiesis.

- Novel treatment for anemia by targeting a previously unknown function of CD24
- Stimulates erythropoiesis and induces long-term production of endogenous erythropoietin

Spleens treated with IgG control or anti-CD24 antibody at 1, 3 and 5 days post-injection. Increased erythropoiesis results in splenomegaly in mice treated with αCD24.
Repeated injection of αCD24 restimulates reticulocytosis

Enhanced production of endogenous erythropoietin (EPO)

Proliferative expansion of splenic & bone marrow red blood cell (RBC) precursors

Differentiation of RBC precursors into reticulocytes (reticulocytosis)

Anti-CD24 monoclonal antibody stimulation does not boost erythropoiesis in CD24-/- mice, Batf3-/- (ablates CD8α+ dendritic cells) mice, or c-kit-/- mice.
Anti-CD24 antibodies exhibit increased splenic red blood cell precursors

Control non-humanized chimeric mice (NSG) and humanized mice (hNSG) treated with anti-CD24 antibodies compared to mice treated with IgG control.
Relevant Publications

Intellectual Property

- UVA Tech ID: BRACIALE-ERYTHRO
  - Title: Compositions and methods for regulating erythropoiesis