

Title: Elucidating the role of TENT5C-mediated polyadenylation in erythropoiesis

Red blood cells, erythrocytes, are necessary for all mammals as they transport oxygen and carbon dioxide. Since they are quite short living, it is necessary to supply new red blood cells constantly. An adult human produces ~2.5 million red blood cells per second, and an adult mouse ~7,000. The formation of red blood cells is a very complicated process in which the precursor cells undergo a series of divisions during which their composition and structure change dramatically. At the final stage, a massive amount of oxygen-transporting hemoglobin is produced, the cell nucleus and other parts of the cell, redundant at this stage, are expelled to form a mature erythrocyte. All these changes are possible thanks to the information stored in genes, while the regulation of gene expression is responsible for all changes that give rise to normal red blood cells. Importantly, disorders of red blood cell formation can lead to severe conditions such as anemias.

In our study, we found that mutations in the gene encoding the regulatory protein TENT5C, leads to anemia in mice. The goal of this project is to understand the mechanism of action of the protein we study, which is important for understanding the entire process of red blood cell formation. Our research may also extend our understanding of diseases such as anemia.