



Ashley Toye

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Dr Ashley Toye is a Reader in Cell Biology the School of Biochemistry at University of Bristol and an NHS Blood and Transplant (NHSBT) Principal Investigator. He is the Director of the National Institute for Health Research (NIHR) Blood and Transplant Research Unit in Red Cell Products (<http://www.bristol.ac.uk/btru/>) at the University of Bristol in partnership with NHSBT which is preparing for a Clinical trial of laboratory produced red cells. Dr Toye's lab is focused on the study and manipulation of erythropoiesis in health and disease; in particular understanding the biogenesis of the specialized red cell membrane. He is using synthetic biology approaches with the goal of generating novel therapeutics from *in vitro* produced reticulocytes. Research highlights includes development of an *in vitro* erythroid culture system (Haematologica 2010), which increases the overall yield of reticulocytes generated from human peripheral blood by culturing the CD34- cell population which was used to describe membrane protein complex assembly (Blood, 2011). His lab has pioneered the culture of blood samples taken from patients with rare diseases and the manipulation of erythroblast protein expression; including determining when hallmark alterations occur during Hereditary Spherocytosis (Haematologica 2010; 2014; 2016) and Congenital Dyserythropoietic Anemia II phenotypes caused by Sec23B mutations (Haematologica 2013; Brit J Haem 2018). He also uses proteomics to explore *in vitro* produced reticulocytes (Plos One 2013; 2014; Mol Cell Proteomics 2016). More recently his laboratory has contributed to the characterisation and manipulation of immortalised erythroblasts (Nature Comms, 2017) and used CRISPR-Cas9 to enhance transfusion compatibility by knocking out 5 problematic blood groups (ABO Bombay phenotype, Rh, Kell, Duffy and GPB) in a single cell line, which produces functional reticulocytes (EMBO Molecular Medicine, 2018).