

The role of FAM46C in B-cell physiology.

The immune system provides our bodies robust defenses from pathogens. One of the most important aspects of the adaptive immune response is the production of antibodies that specifically recognize foreign molecules. B lymphocytes are responsible for the production of antibodies. They are white blood cells that originate from the bone marrow. New (naïve) B-cells reside in the lymphatic system and when they encounter foreign molecules, so-called antigens, they are stimulated to divide and mature, thereby becoming plasma cells, which produce great amounts of antibodies. Regulation of B lymphocyte development is therefore of fundamental importance for our immune response, while abnormalities in B-cell maturation can lead to development of neoplastic diseases, such as multiple myeloma.

We recently identified previously uncharacterized gene, FAM46C, as a regulator of B lymphocyte maturation. Importantly, mutations in this gene are associated with the development of multiple myeloma. The aim of this project is to understand the mechanism of action of FAM46C.

We will use state of the art approaches in our research. We constructed transgenic mice that lack the FAM46C gene as well as mice that express the FAM46C protein with a fluorescent tag. These research models combined with molecular analyzes will allow us to deeply understand how FAM46C regulates growth and differentiation of B lymphocytes. Moreover, we are convinced that our study will help to decipher the role of FAM46C mutations in the pathogenesis of multiple myeloma, a cancer which is incurable so far.