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ABSTRACT

Collectin is a very unique protein, which has a collagen-like domain and a calcium dependent-carbohydrate recognition domain (CRD). It is considered as a molecule recognizing a pathogen with associated molecular patterns (PAMPs) that play an important role in innate immunity. In 2011, an unexpected report was published showing that the deletion of collectin kidney 1 (CL-K1) or MASP-3 due to a gene mutation causes a rare autosomal recessive genetic disorder as 3 MC syndrome which can cause physical anomalies in humans. In this project, we would like to demonstrate the mew biological functions of CL-K1 and CL-P1 to use using gene knock-out mice. In the CL-P1 study, we could not get the knock-out mice with normal delivery. We considered that CL-P1 might play an important role since its mRNA expression in very early phase after fertilization was observed. However, a lot of experiments are needed to elucidate questions with its biological functions. In the CL-K1 study, we focused on the establishment of the ELISA analysis system and the CL-K1 gene knock-out mice. In 2012, we established the ELISA system to detect the blood level of CL-K1 in human. More recently, Takahashi and our team demonstrated the surprising findings in up regulation of CL-K1 in DIC patients in the United States, which is a severe medical condition with a high incidence of multiple organ dysfunction and high mortality. This is the first report showing the association between plasma CL-K1 and DIC, so that further investigation is also needed to be definitive. In the knock-out mice study, the knock-out mice have been established very recently so that now we are involving in elucidate the phenotypes in the mice.

Recently, numerous new findings related to biological functions with collectin and related proteins have been reported. These novel functions are sometimes related with complement activation, but in other cases they are not. Definitive mechanisms or related molecules are at this time, unknown. Further investigations are needed in order to understand the mechanisms of these newly reported biological functions.