Roles of intestine-specific homeoprotein CDX2 in the intestinal epithelial barrier

Koji Aoki¹²³, Shun-ichiro Iemura⁴, Katsuya Okawa⁵, Isei Tanida⁶, Taira Kobayashi⁷, Hitomi Mimuro⁷, Sanada Takahito⁷, Chihiro Sasakawa⁷, Tohru Natume⁴, Manabu Sugai⁸ and Makoto M Taketo³

¹. Tenure-Track Program for Innovative Research, University of Fukui
². PREST, Japan Science and Technology Agency
³. Department of Pharmacology, Graduate School of Medicine, Kyoto University
⁴. National Institutes of Advanced Industrial Science
⁵. Drug Discovery Research Laboratories, Kyowa Hakko Kirin Co., Ltd.
⁶. Department of Biochemistry & Cell Biology, National Institute of Infectious Diseases
⁷. Department of Infectious Disease Control, International Research Center for Infectious Disease, University of Tokyo
⁸. Department of Experimental Therapeutics, Translational Research Center, Kyoto University Hospital

Abstract
The intestinal epithelial cells serve as a barrier against bacterial pathogens. Autophagy in the intestinal epithelial cells plays key roles in the intestinal mucosal immunity, while suppression of autophagy in the cells accelerates the chronic intestinal inflammation. Recently, I found that intestine-specific homeoprotein CDX2 stimulated autophagy probably through interaction with ATG7, an E1-like enzyme essential for autophagosome formation. To investigate regulation mechanisms of ATG7 by CDX2, we have analyzed proteins associated with the CDX2-bound ATG7 complexes. We have also investigated roles of CDX2 in the intestinal mucosal immunity. The final goal of this study is to identify therapeutic targets to treat the chronic intestinal inflammation.