Establishment of a novel anti-CD20 monoclonal antibody C_{20}Mab-11 using the Cell-Based Immunization and Screening (CBIS) method for the detection of B cells in many applications

Yoshikazu Furusawa[1,2,3], Mika K. Kaneko[1], Takashi Miwa[3], Masato Fukui[3], Yukinari Kato[1,2]

[1]Dept. Antibody Drug Development, Grad. Sch. Med., Tohoku Univ., [2]New Industry Creation Hatchery Center., Tohoku Univ., [3]ZENOAQ RESOURCE CO., LTD.

Purpose: CD20 is one of B-lymphocyte antigens, and is known as an effective target for B cell lymphomas. Although anti-CD20 monoclonal antibody (mAb) drugs have brought significant survival benefits to B cell lymphoma patients, some patients have shown no clinical response in a second treatment of anti-CD20 mAbs; therefore, more effective treatment of B cell lymphomas should be developed. In this study, we aimed to develop useful anti-CD20 mAbs for treatment or research of B cell lymphoma.

Methods: For the anti-CD20 mAb development, we used Cell-Based Immunization and Screening (CBIS) method. CD20-overexpressed LN229 cells (LN229/CD20) were used for immunization. The screening of hybridomas was performed by flow cytometry (FCM) using CD20-overexpressed CHO cells.

Results: We used 8 Balb/c mice for the hybridoma development, and obtained 18 anti-CD20 mAbs. Of those clones, C_{20}Mab-11 (IgM, kappa) was shown to be useful for FCM and western blot (WB) for endogenous CD20-expressing cell lines. Furthermore, C_{20}Mab-11 strongly stained B cells of the lymph follicle via immunohistochemistry (IHC).

Conclusion: Using CBIS method, we successfully developed a sensitive and specific anti-CD20 mAb C_{20}Mab-11, which is useful for FCM, WB, and IHC.