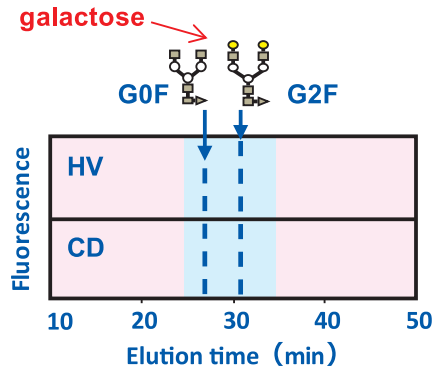
Development of a diagnostic method for patients with chronic inflammatory disease using analysis of sugar chains of IgGs

Principal Investigator	Department of Biopathological Information Science, Graduate School of Medicine, Osaka University
	Professor Eiji MIYOSHI

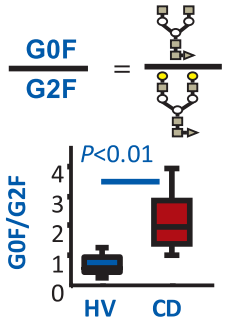
Project Outline

Summary: The function of sugar chains of IgGs has received a lot of attention recently. So far, we have discovered a method that can distinguish inflammatory bowel disease (IBD) by analyzing sugar chains of IgGs using HPLC. Furthermore, we have found that the lectins called ABA and GSL-II have a high affinity with lgGs derived from patients with Crohn's disease and have proved their usefulness against a differential diagnosis of IBD. In this project, we will verify usefulness of the IgG sugar chain kit against diagnosis of chronic inflammation including IBD and we will evaluate the activity.

As a result of analysis of sugar chains of IgGs by HPLC, the number of galactose-deficient IgGs has increased in patients with Crohn's disease.

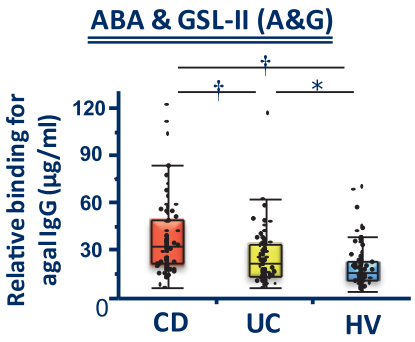


Am J. Gastroenterology 103(5) 1173-81, 2008



HV: Healthy subject
CD: Crohn's disease
UC: Ulcerative colitis

Dual lectin ELISA has been established using ABA and GSL-II.



IBD Journal 19(2) 321-31, 2013

Condition: Chronic inflammatory disease including inflammatory bowel disease (IBD)

Patent information: National/international patents on differential diagnosis of IBD were established(LSIP fund), Patent application 2006-140457, PCTJP2007/060257; National Patent Applications for evaluation of chronic inflammation using lectins 2010-119099

Features of the technology: Develop a kit that can assay galactose-deficient IgGs which show chronic inflammation activity, and evaluate the usefulness.

Marketability: The number of patients with inflammatory bowel disease in Japan has been increasing year by year and is currently over 120,000. The number of patients in Europe and America is estimated to reach 10-fold of this, so that if a concrete kit is developed, the market size would be 20 to 30 billion yen.

Issues on the development: Using HPLC will be a diagnostic marker itself; however, it takes time and multi-sample treatment is difficult. Using lectin-antibody ELISA is also troublesome for the IgG purification step from serum. Thus, we will develop an automatic IgG purified lectine-antibody ELISA and prepare a special antibody against galactose-deficient IgG.