Glycoprotein 2 (GP2)

Crohn's disease (CD) and ulcerative colitis (UC) are the two most frequently occurring inflammatory bowel diseases (IBD) in Caucasians. Mucosal inflammation in CD appears to occur when dysregulation of the immune system leads to an imbalance between tolerance to commensal microbiota or food-derived antigens and immunity to pathogens (Conrad *et al.* 2014). The development of CD involves autoimmune mechanisms, and the occurrance of exocrine pancreas autoantibodies (PAB) in approximately 40% of CD patients is considered to be disease-specific. Interestingly, PAB have been detected in 68% of CD patients with extraintestinal complications such as idiopathic chronic pancreatitis (Somma *et al.* 2013; Stöcker *et al.* 1984).

PAB were first detected by Stöcker *et al.* in 1984 during a screen of 59 sera obtained from endoscopically and histologically confirmed CD patients. Using indirect immunofluorescence (IIF), 39% of all sera were found to contain PAB. In 2009, Roggenbuck *et al.* demonstrated for the first time that glycoprotein 2 (GP2) is the major autoantigen of CD-specific PAB.

GP2 is a highly glycosylated 78 kDa protein with N-linked carbohydrates. It accounts for up to 40% of all zymogen granule (ZG) membrane proteins in pancreatic acinar cells and is linked to the ZG membrane via a C-terminal glycosyl phosphoinositol (GPI) anchor (Hoops *et al.* 1993; Somma *et al.* 2013). Upon hormonal or neuronal stimulation of the pancreas, GP2 is transported to the apical compartment of acinar cells. Following cleavage of its GPI anchor, GP2 is released into the pancreatic duct and subsequently into the intestinal lumen. As a self-binding glycoprotein, GP2 forms soluble aggregates in the pancreatic juice (Rindler *et al.* 1990). The physiological function of GP2 in the pancreas is still elusive, but it has been suggested to be involved in the formation of pancreatic granules (Colomer *et al.* 1994; Somma *et al.* 2013).

A major step forward in the understanding of CD has been the finding that GP2 is also expressed on the apical membrane of microfold/membranous cells (M cells). M cells are phagocytotic cells found in the Peyer's patches of the intestinal follicle-associated epithelium, which take up macromolecules and microbes from the intestinal lumen to induce the mucosal immune response. In addition, some results appear to indicate an immunosuppressive and anti-inflammatory role of GP2, which would further highlight its pivotal role in the regulation of the mucosal immune response (Hase *et al.* 2009).

Anti-GP2 autoantibodies constitute novel disease-specific markers, the quantification of which could improve the serological diagnosis of IBD. Detection of anti-GP2 autoantibodies by ELISA is a readily available and robust method for the assessment of CD-specific autoantibodies. In two studies carried out by Roggenbuck *et al.* (2009, 2011), the level of GP2 specific autoantibodies in PAB positive and negative sera were analyzed by ELISA. In these studies, the levels of GP2 autoantibodies were reported to be significantly higher in PAB positive sera than in the controls and sera of UC patients. This seems to make the use of GP2 autoantibodies a useful serological tool to diagnose CD.

Recombinant human GP2 from DIARECT is produced in the baculovirus/insect cell expression system.

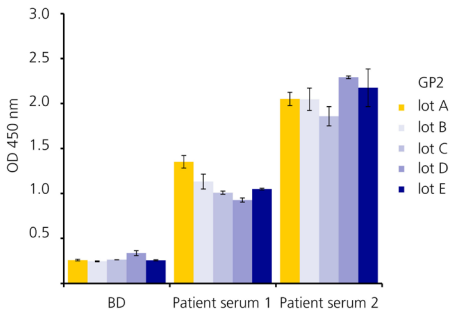

Figure: Analyses of sera from a healthy blood donor (BD) and patients with Crohn's disease (Patient serum 1-2) for the presence of anti-GP2 autoantibodies by ELISA. Five different lots of recombinant human GP2 were used as coating antigen.

References:
Colomer *et al.* (1994) EMBO J. 13 (16): 3711-3719
Conrad *et al.* (2014) Autoimmun Rev. 13 (4-5): 463-466
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Hoops *et al.* (1993) J Biol Chem. 268 (34): 25694-25705
Rindler *et al.* (1990) Eur J Cell Biol. 53 (1): 154-163
Roggenbuck *et al.* (2009) Gut. 58 (12): 1620-1628
Roggenbuck *et al.* (2011) Clin Chem Acta. 412 (9-10): 718-724
Roggenbuck *et al.* (2014) Clin Chem Lab Med. 52 (4): 483-494
Somma *et al.* (2013) Gastroenterol Res Pract. 2013: 683824
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Ordering Information		
19600	GP2	0.1 mg
19601		1.0 mg

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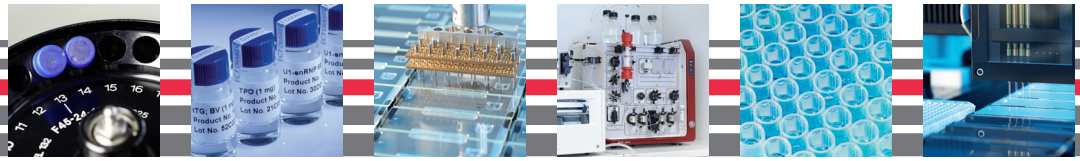

DIARECT GmbH · Bötzinger Str. 29 B · 79111 Freiburg · Germany
Tel. +49 (0) 761 47979-0 · Fax +49 (0) 761 47979-29 · orders-dia@bbisolutions.com · www.bbisolutions.com