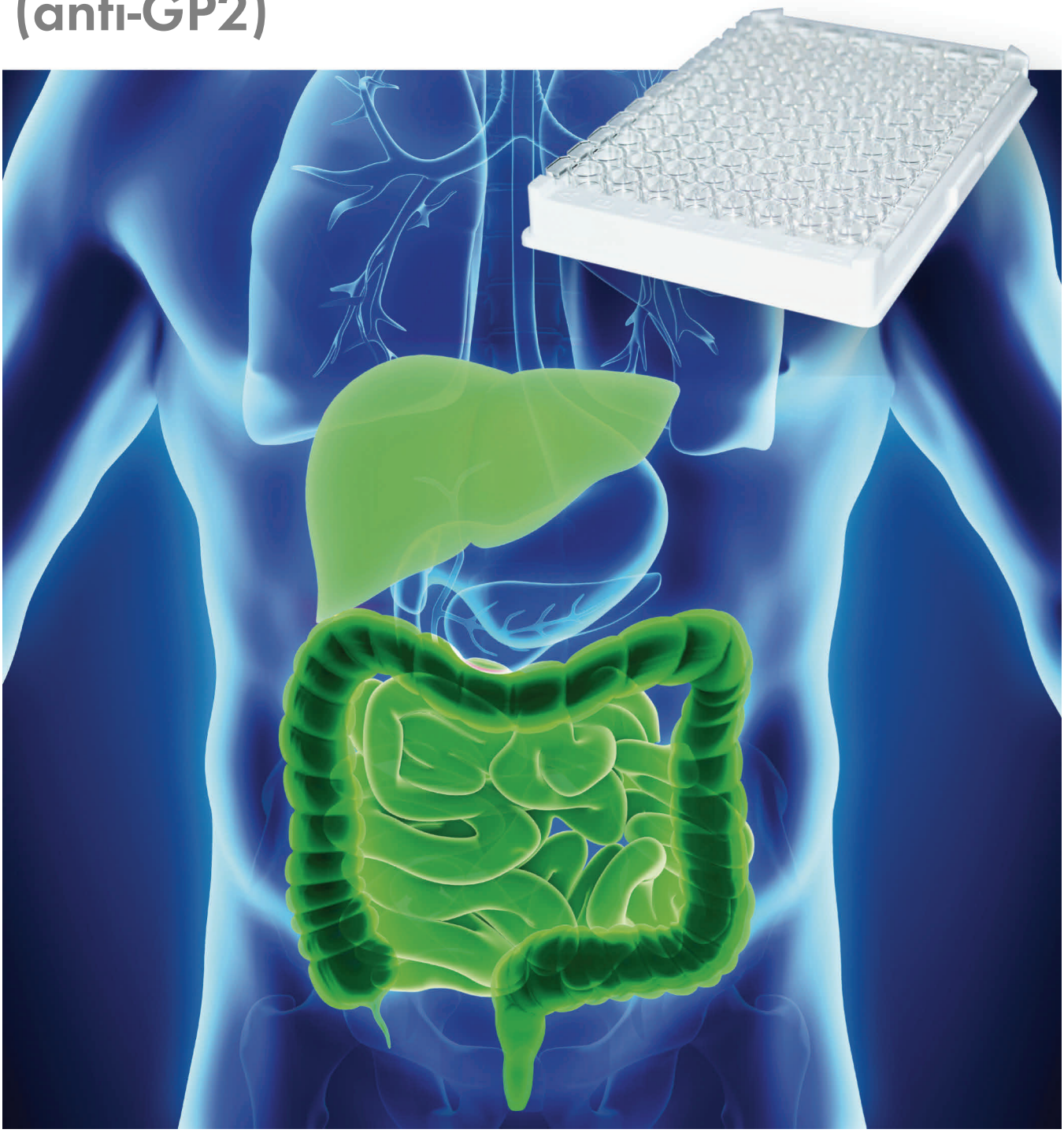
Crohn's Disease

Simply innovative diagnostics

Sharpening the CD/UC discrimination:

Antibodies to Glycoprotein 2

(anti-GP2)



Antibodies to Glycoprotein 2 (anti-GP2)

Crohn's disease (CD), like ulcerative colitis (UC), is a chronic inflammatory bowel disease (IBD) with unknown etiology, causing **relapsing-remitting** inflammatory processes of the intestine. CD affects the entire gastro-intestinal tract, mainly the colon, rectum and small intestine. In contrast, UC is a diffuse ascending inflammation restricted to the mucosa and submucosa of the rectum and colon. Differential diagnosis of CD and UC has been a clinical challenge since decades. Common diagnostic tools are:

- ✓ X-ray examination of ileum
- ✓ Endoscopy with biopsy and histology
- ✓ Sonography
- ✓ Autoantibody detection

Due to the limitations of the existing diagnostic tools there has been an ongoing search for additional diagnostics. **Serological parameters** could assist clinicians in diagnosing and stratifying patients with inflammatory bowel disease and may support therapeutic decisions (7). Up to **70 %** of patients with CD show antibodies to *Saccharomyces cerevisiae* (ASCA) (3 & 4). Roggenbuck *et al.* (1) identified glycoprotein 2 (GP2) - the major glycoprotein of the zymogen granule membrane - as the antigen of pancreatic antibodies (PAb) in Crohn's disease and demonstrated the specificity of these antibodies for CD in comparison to patients suffering from UC (Figures 1 IgG and IgA). In combination with antibodies against *Saccharomyces cerevisiae* the determination of such antibodies (anit-GP2) is an excellent and suitable tool for differential diagnosis in CD (5-7).

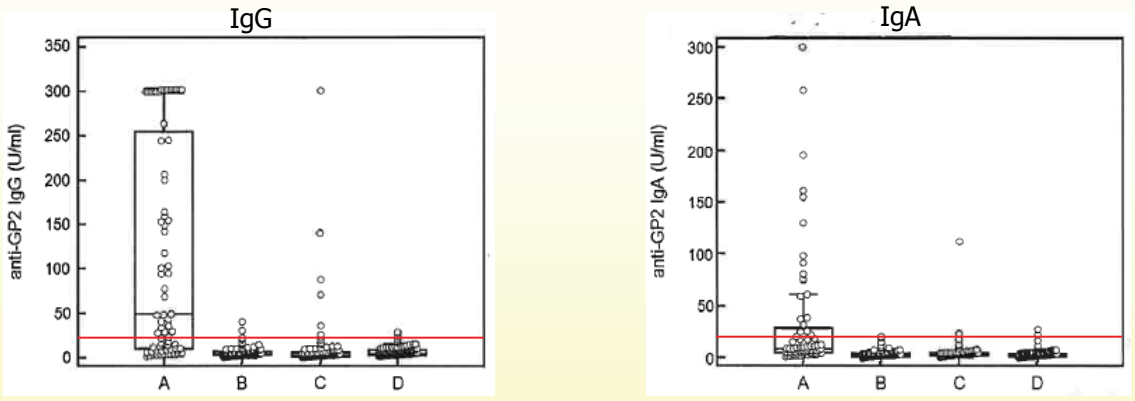


Figure 1:
Detection of anti-GP2 by ELISA in A: PAb positive sera in patients with Crohn's disease (n=72), B: PAb negative sera from patients with Crohn's disease (n=106), C: Ulcerative colitis (n=100) and D: healthy blood donors (162). Cut-off (red line) is 20 U/ml.

Antibodies to Glycoprotein 2 (anti-GP2)

Anti-GP2 ELISA*) for the differential diagnosis of Crohn's disease

GP2 was identified as the antigen of pancreatic autoantibodies (PAb) in Crohn's disease by Roggenbuck et al. in 2009 (1). The first ELISAs for the detection of autoantibodies to GP2 were reported in 2011 (2).

*) ***manufactured under the licence of patents***
US 8058019, EP 2126582, JP 2010519180, CA 2674021, AU 2008209176, ZL 2008800030495, 10-1283710

Anti-*Saccharomyces cerevisiae* antibodies (ASCA) ELISA for differential diagnosis of Crohn's disease

Conrad et al. (3) and Bossuyt et al. (4) showed a diagnostic relevance of ASCA in patients suffering from Crohn's disease.

Anti-*Saccharomyces cerevisiae* antibodies (ASCA) ELISA for differential diagnosis of Crohn's disease

Demonstrated by Deng, Li *et al.* and by Zhang *et al.* The anti-GP2 antibody is a specific marker of CD (5). Anti-GP2 displayed a better discriminatory per-formance over ASCA in differentiating CD from UC, CD from intestinal BD, and CD from ITB. (5).

Both IgG and IgA

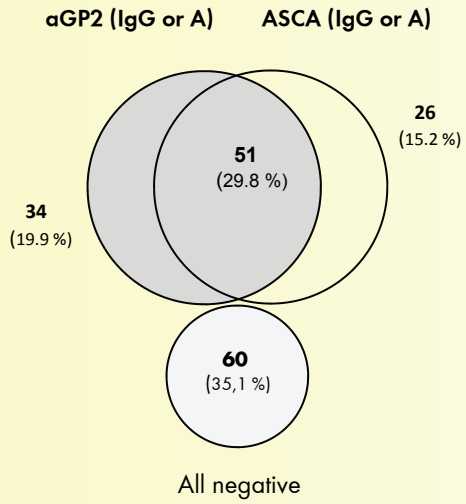


Figure 2:
Venn diagram describing the relation between serological markers (aGP2 and ASCA) in a CD cohort (6)

References - Antibodies to Glycoprotein 2 (anti-GP2)

(1) Identification of GP2, the major zymogen granule membrane glycoprotein, as the autoantigen ofpancreatic antibodies in Crohn's disease
Roggenbuck D, Hausdorf G, Martinez-Gamboa L, Reinhold D, Büttner T, Jungblut PR, Porstmann T, Laass MW, Henker J, Büning C, Feist E, Conrad K. *Gut. 2009 Dec;58(12):1620-8*

(2) Autoantibodies to GP2, the major zymogen granule membrane glycoprotein, are new markers in Crohn's disease
Dirk Roggenbuck, Dirk Reinhold, Thomas Wex, Alexander Goihl , Ulrike von Arnim, Peter Malfertheiner, Thomas Büttner, Tomas Porstmann, Silvia Porstmann, Bodo Liedvogel, Dimitrios P. Bogdanos, Martin W. Laass, Karsten Conrad. *Clinica Chimica Acta 412 (2011) 718-724*

(3) Serological differentiation of inflammatory bowel diseases Conrad K, Schmechta H, Klafki A, Lobeck G, Uhlig HH, Gerdi S, Henker J. *Eur J Gastroenterol Hepatol. 2002 Feb;14(2):129-35*

(4) Serologic markers in inflammatory bowel disease
Xavier Bossuyt. *Clin Chem. 2006 Feb;52(2):171-81. Epub 2005 Dec 8. Review*

(5) Diagnostic value of the antiglycoprotein-2 antibody for Crohn's disease: a PRISMA-compliant systematic review and meta-analysis Chuiwen Deng, Wenli Li, Jing Li, Shulan Zhang, Yongzhe Li Deng C, et al. *BMJ Open* 2017 7:e014843

(6) Antibodies against glycoprotein 2 display diagnostic advantages over ASCA in distinguishing CD from intestinal tuberculosis and intestinal Behçet's disease. Shulan Zhang, MD, Jing Luo, MD, Ziyan Wu, MD, Dirk Roggenbuck, MD, PhD, Peter Schierack, PhD, Dirk Reinhold, MD, Ji Li, MD, Xiaofeng Zeng, MD, Fengchun Zhang, MD1 Jiaming Qian, MD and Yongzhe Li, MD. *Clinical and Translational Gastroenterology (2018) 8, e*

(7) Autoimmunity in Crohn's Disease - A Putative Stratification Factor of the Clinical Phenotype
D. Roggenbuck, D. Reinhold, D.C. Baumgart, P. Schierack, K. Conrad, M.W. Lass
Advances in Clinical Chemistry, Volume 77: 77-101 Epub 2016 June 30. Review

For further reading

Loss of tolerance to gut immunity protein, glycoprotein 2 (GP2) is associated with progressive disease course in primary sclerosing cholangitis Tamas Tornai, David Tornai, Nora Sipeki, Istvan Tornai, Rayan Alsulaimani, Kai Fechner, Dirk Roggenbuck, Gary L. Norman, Gabor Veres, Gabriella Par, Alajos Par, Ferenc Szalay, Peter Laszlo Lakatos, Peter Antal-Szalmas & Maria Papp. *Nature Scientific Reports (2018) 8:399*

Antibodies against glycoprotein 2 are novel markers of intestinal inflammation in patients with an ileal pouch
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Crohn's disease specific pancreatic antibodies: clinical and pathophysiological challenges
Dirk Roggenbuck, Dirk Reinhold, Peter Schierack, Dimitrios P. Bogdanos, Karsten Conrad and Martin W. Laass.
DE GRUYTER, DOI10.1515/cclm-2013-08-01-Clin Chem Lab Med 2013; aop

Order information

TEST	Order No	Determination
Anti-GP2 IgG	3850	96
Anti-GP2 IgA	3750	96
ASCA IgA	4006	96
ASCA IgG	4007	96

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