Sharpening the CD/UC discrimination: Antibodies to Glycoprotein 2 (anti-GP2)
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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).

- **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 performance over ASCA in differentiating CD from UC, CD from intestinal BD, and CD from ITB. (5).

Both IgG and IgA

![Diagram](image.png)

*Figure 2: Venn diagram describing the relation between serological markers (aGP2 and ASCA) in a CD cohort (6)*
Antibodies to Glycoprotein 2 (anti-GP2)

References - Antibodies to Glycoprotein 2 (anti-GP2)

(1) Identification of GP2, the major zymogen granule membrane glycoprotein, as the autoantigen of pancreatic antibodies in Crohn’s disease

(2) Autoantibodies to GP2, the major zymogen granule membrane glycoprotein, are new markers in Crohn’s disease

(3) Serological differentiation of inflammatory bowel diseases

(4) Serologic markers in inflammatory bowel disease

(5) Diagnostic value of the antiglycoprotein-2 antibody for Crohn’s disease: a PRISMA-compliant systematic review and meta-analysis
Chuiven 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 Behcet’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 Jiamoing 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

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 Alsuulaimani, 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


Crohn’s disease specific pancreatic antibodies: clinical and pathophysiological challenges

Order information

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<th>TEST</th>
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