

# Calprotectin (CALPRO), Fecal

## A MARKER OF INFLAMMATORY BOWEL DISEASE

### Test Highlights

- Calprotectin (CALPRO) has been demonstrated to be an effective marker of inflammatory bowel disease (IBD) in both children and adults.
- CALPRO correlates well with more invasive measures of gastrointestinal inflammation.
- CALPRO is stable in stool for five days at room temperature and can be detected in even small (<5 g) random stool samples.
- This CALPRO assay is FDA-cleared for in vitro diagnostic use.

### Clinical Background

- As many as 1.4 million individuals in the United States and 2.2 million individuals in Europe suffer from inflammatory bowel disease.
- IBD (i.e., ulcerative colitis and Crohn disease) is an organic disorder of the gastrointestinal tract that causes damage to the mucosal lining of the intestine. This damage is characterized by inflammation and ulcerations. Fecal material in the bowel comes in contact with the intestinal mucosa and therefore should contain specific markers of mucosal disease.
- Histologic features of ulcerative colitis and Crohn disease include leukocyte infiltration into the intestinal wall, leading to the presence of leukocytes and cytoplasmic contents in the bowel itself.
- CALPRO accounts for 60 percent of the protein content in the cytoplasm of neutrophils. It has antibacterial and antifungal activity, inhibits metalloproteinases, and promotes apoptosis in malignant and non-malignant cell cultures. For these reasons, its presence in body fluids, including feces, is proportionately related to the amount of inflammation present.
- IBD diagnosis may be delayed because of vague symptoms or hesitancy to use more invasive procedures, such as endoscopy and biopsy.
- A meta-analysis of 13 clinical studies, which included 670 adults and 371 children or teenagers, indicated that in adults CALPRO is 93 percent sensitive and 96 percent specific for distinguishing IBD from functional disorders of the bowel. In children or teenagers, the sensitivity is 92 percent and the specificity is 76 percent. Because of potential bias, including spectrum bias (i.e., diagnostic accuracy varying with disease severity in the population tested), this data should be evaluated cautiously.
- CALPRO is evenly distributed in feces and is resistant to bacterial degradation, making it stable in stool samples.

### Indications for Ordering

- To help differentiate IBD from functional disorders of the intestinal tract, such as irritable bowel syndrome.
- To aid in monitoring IBD activity and predicting relapse.

### Interpretation

- Normal: 0–50 ug/g.

- CALPRO results of 51–120 ug/g are considered borderline and should be re-evaluated in four to six weeks.
- CALPRO results >120 ug/g are clearly abnormal and suggest IBD.

### Limitations

- Fecal CALPRO is an indicator of the presence of neutrophils in stool and is not specific for IBD.
- Other intestinal ailments, including GI infections and colorectal cancer, can result in elevated concentrations of CALPRO.
- Diagnosis of IBD cannot be established solely on the basis of a positive CALPRO result.
- Patients with IBD fluctuate between active and inactive stages of disease. CALPRO results may also fluctuate.
- GI bleeding of as much as 100 mL per day will increase the fecal CALPRO concentration by only 15 ug/g.

### Methodology

The CALPRO immunoassay is an enzyme-linked immunosorbent assay (ELISA) system with colorimetric detection. The CALPRO concentration is measured in ng/mL and then converted to ug of CALPRO per gram of stool (ug/g).

### Related Tests

Lactoferrin, Fecal ([0061164](#))

### References

1. Sutherland AD, Gearry RB, Frizelle FA. Review of fecal biomarkers in inflammatory bowel disease. *Dis Colon Rectum* 2008;51(8):1283–91.
2. Loftus EV Jr. Clinical epidemiology of inflammatory bowel disease: Incidence, prevalence, and environmental influences. *Gastroenterology* 2004;126:1504–17.
3. van Rheenen PF, Van de Vijver E, Fidler V. Faecal calprotectin for screening of patients with suspected inflammatory bowel disease: diagnostic meta-analysis. *Br Med J* 2010; 341:c3369.
4. Judd TA, et al. Update of fecal markers of inflammation in inflammatory bowel disease. *J Gastroenterol Hepatol* 2011;26(10):1493–9.

## Test Information

**0092303**

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For specific collection, transport, and testing information, refer to the ARUP website at [www.aruplab.com](http://www.aruplab.com).

For information on test selection, ordering, and interpretation, refer to ARUP Consult® at [www.arupconsult.com](http://www.arupconsult.com).

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