



***FOB-Transferrin +  
Calprotectin-Lactoferrin  
New Combo Card***

**CerTest Biotec**  
[www.certest.es](http://www.certest.es)



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# Hemoglobin (FOB)

- ❑ Refers to blood in the faeces, no visibly apparent.
  - ✚ Abnormal bleeding occurring somewhere in the gastrointestinal tract.
- ❑ Screening methods for colorectal cancer depend on detecting either precancerous changes such as certain kinds of polyps or finding early cancer.
- ❑ FOB test are used primarily as a screening tool for early detection of colorectal cancer.
  - ✚ Cancer of the large intestine (colon), lower part of digestive system
  - ✚ Symptoms: blood in stool
  - ✚ Regular screening tests help to prevent from colon cancer by identifying polyps





# Transferrin

- ❑ Transferrin is a blood plasma protein that transports iron through the blood to the liver, spleen and bone marrow.
- ❑ Glycoprotein highly resistant to bacterial degradation as well as to breakdown by digestive enzymes.
- ❑ Good marker to detect loss of blood from upper and lower intestine.
- ❑ The **Transferrin protein** is resistant to the microbial and enzymatic proteolysis in the digestive tract.
- ❑ The detection of **faecal Transferrin** (much more stable than Haemoglobin) provides the best alternative way of diagnosing the disease in the upper digestive tract.





# Transferrin versus Hemoglobin

Transferrin	Hemoglobin	Digestive tract: hemorrhage level
+	+	upper/lower: acute blood loss
+	-	upper part (gastric and intestine): acute blood loss
-	+	lower part (colon): slight blood loss
-	-	no gastrointestinal bleeding





# Calprotectin

- ❑ Calprotectin is a calcium and zinc binding protein with bacteriostatic and fungistatic properties.
  - ✚ Twice sensitivity to that of fecal occult blood for the identification of colorectal adenoma or carcinoma
  - ✚ Resistant to enzymatic degradation and easily measured in faeces
  
- ❑ Excellent marker for the presence and severity of gastrointestinal inflammation in adults and children with inflammatory bowel disease.
  
- ❑ Increased values of faecal Calprotectin are found in:
  - ✚ Inflammatory Bowel Disease (IBD)
  - ✚ Colonic cancer
  - ✚ Non-steroidal anti-inflammatory drug treatment
  - ✚ Strongly associated with colorectal inflammation
  
- ❑ Its stability against bacteria degradation is the main advantage against other markers as Lactoferrin.
  - ✚ Stable in faeces for several days after excretion
  - ✚ Able to predict relapse in IBD





# Lactoferrin

- ❑ Glycoprotein found in many body fluids as well as in granules of neutrophil granulocytes.
  - ✚ Sensitive and specific marker in identifying intestinal inflammation
  - ✚ Elevated levels of Lactoferrin released from faecal leucocytes as a marker of intestinal inflammation
  - ✚ Faecal lactoferrin levels may rise significantly prior to a clinically evident relapse and may be a good marker to predict subsequent flares
  - ✚ Preclinical indicator of relapse
  
- ❑ Lactoferrin faecal concentration is increased in patients with active IBD.
  - ✚ Faecal lactoferrin is a non-invasive marker elevated in Crohn's disease compared to Irritable Bowel Syndrome (IBS).
  
- ❑ Useful for the evaluation of patients suffering from IBD caused by enteric pathogens: Rotavirus, E. coli, Crypto, Campylobacter, Shigella and Clostridium.





# Calprotectin / Lactoferrin

Calprotectin	Lactoferrin	
+	+	No irritable bowel syndrome (IBS) Intestinal inflammation (ulcerative colitis/Crohn's disease) Enteric infection. Early relapse
+	-	Intestinal inflammation (ulcerative colitis, Crohn's disease) Colonic inflammation. Colorectal adenoma or carcinoma No enteric pathogen infection Effect of non-steroidal anti-inflammatory drug (NSAID)
-	+	Intestinal inflammation (ulcerative colitis, Crohn's disease) Relapse and IBD flares Enteric infection E. coli, Shigellosis or C. difficile toxin
-	-	No IBD. No enteric infection. IBS if symptoms persists





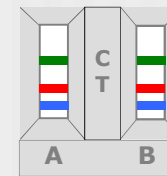
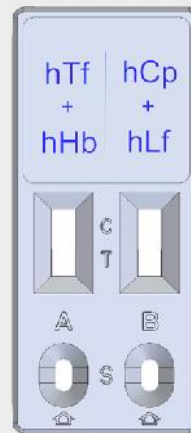
# Hb+Tf /Cp+Lf test. Why?

- ❑ New tumour and inflammatory line to get immediate information about bleeding and/or inflammation in the digestive tract.
  - ✚ Mucosal inflammation may be detected through faecal markers
  - ✚ Fecal sample providing 16 different combination results from 4 analytes
  - ✚ Non-invasive test useful for the screening of inflammation in patients presenting abdominal pain and diarrhoea
  
- ❑ The detection of fecal Transferrin, added value to our traditional FOB fecal rapid test, much more stable than Haemoglobin, provides the best alternative way of diagnosing the disease in the upper digestive tract.
  - ✚ Rapid test detecting simultaneously Haemoglobin and Transferrin provides early colorectal cancer diagnosis
  
- ❑ Fecal Calprotectin and Lactoferrin are promising non-invasive markers for intestinal inflammation, presenting abdominal pain and diarrhoea.
  - ✚ Patients suffering from IBS do not have increased faecal Calprotectin values
  - ✚ Useful in predicting relapse and follow-up

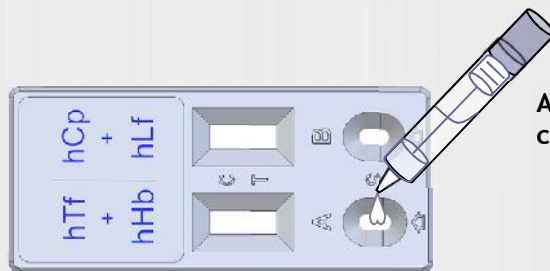




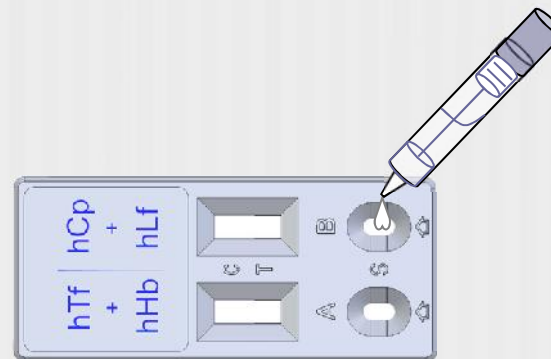
# CerTest combo card performance



Qualitative immunocromatographic assay to determine human Haemoglobin, human Transferrin, Calprotectin and Lactoferrin in stool samples.



Add 4 drops in A-circular window



Use the same tube and add 4 drops in B-circular window





# Results

A Transferrin- Hemoglobin	B Calprotectin- Lactoferrin	
-/-	-/-	No Hemoglobin or Transferrin presence → no gastrointestinal (GI) bleeding No active gastrointestinal inflammation disorder
+/+	+/+	<b>Hemoglobin, Transferrin, Calprotectin and Lactoferrin</b> markers presence. GI bleeding and inflammation caused by ulcerative colitis, Crohn's disease and some types of carcinomas ( <b>colorectal cancer</b> ), ulcers or bacterial infections ( <i>Shigella, Salmonella, Campylobacter, E. coli (EIEC or EAEC) or C. difficile</i> )
-/-	+/+	<b>Calprotectin and Lactoferrin</b> presence: organic GI inflammation caused by ulcerative colitis, Crohn's disease, and some types of carcinomas or bacterial enteropathies ( <i>Shigella, Salmonella, Campylobacter, E. coli (EIEC or EAEC), or C. difficile</i> )
+/+	-/-	<b>Hemoglobin and Transferrin</b> presence. GI bleeding problems caused by some bacterial infections or some carcinomas without inflammation or some traumas





# Conclusions

- ❑ Diarrhoeal illnesses are extremely common throughout the world, causing 2 to 16 illnesses per person per year in developed and developing countries.
- ❑ An important diagnostic clue in considering whether diarrhoea is a non-inflammatory or an inflammatory process is the **examination of fecal leukocytes**
  - ✚ Fecal leukocytes present suggest inflammatory process caused by Salmonella, Shigella, Campylobacter jejuni or Clostridium difficile
- ❑ Non invasive screening assay to diagnosis gastrointestinal bleeding, inflammatory disorders and diarrhoea.
  - ✚ Particularly suitable in **paediatric** practice
  - ✚ Useful during follow-up of patients with already diagnosed colorectal disease
- ❑ **Colorectal cancer** is the leading cause of illness and death in the Western world.
  - ✚ Long-standing inflammatory diseases of the colon, such as ulcerative colitis and Crohn's disease may increase your risk of colorectal cancer
- ❑ Calprotectin and Lactoferrin as good markers in measuring disease activity and predict early relapse in patients with Inflammatory Bowel Disease.





*¡¡ Thanks for your attention !!*

