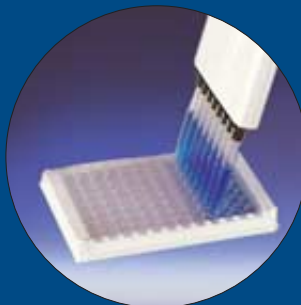
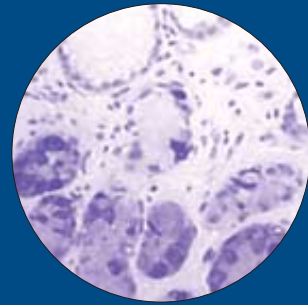
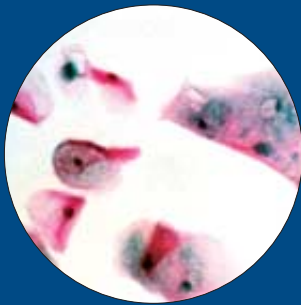
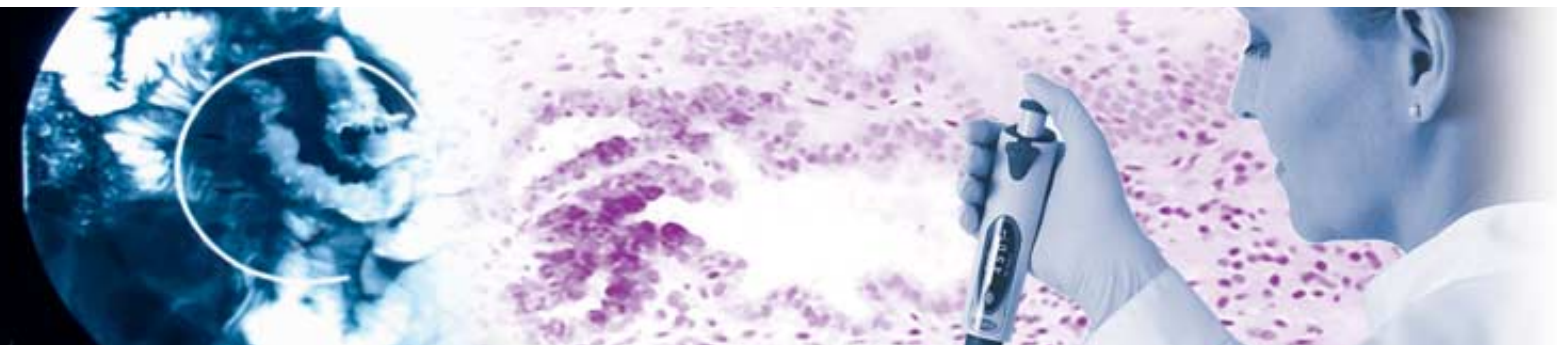


# Biohit Diagnostics Product Catalogue





## Welcome to the Diagnostics World of Biohit

**B**iohit develops and manufactures liquid handling products and diagnostic tests systems for use in health care, research and industrial laboratories. The mission of Biohit is to create such innovations and products, which promote well-being of people and quality of life. Biohit concentrates solely on those business areas in which it possesses knowledge of the customer and market needs as well as a strong multidisciplinary basis on research, technological know-how, innovations and products protected by patents.

The diagnostic product range of Biohit comprises GastroPanel for diagnosing *Helicobacter pylori* infection and atrophic gastritis as well as for screening the risk of gastric cancer, peptic ulcer, esophageal reflux disease, and its complication, Barrett's esophagus from a blood sample. Biohit also offers enzyme linked immunosorbent assay (ELISA) tests for the detection of systemic lupus erythematosus, celiac disease, and inflammatory bowel disease as well as quick tests for the detection of lactose intolerance (hypolactasia) and *Helicobacter pylori*. Biohit develops and manufactures ELISA kits and monoclonal antibodies for cancer research.

The liquid handling product range developed and manufactured by Biohit covers electronic and mechanical pipettors, and disposable tips. The range offered by the company is currently the widest in the world. Biohit is the global market leader of electronic pipettors, and the leading manufacturer of OEM - electronic pipettors in the world.

The product range of Biohit covers, in addition to liquid handling products and diagnostics, instruments used for the analyses of test results. Moreover, Biohit offers maintenance, calibration and training services.

The headquarters of Biohit is located in Helsinki, and the production facilities in Kajaani and Helsinki, Finland. Biohit subsidiaries are located in China (representative office), France, Germany, Japan, Russia, the U.K. and the U.S. The global distributor network of Biohit covers altogether approximately 450 members in 70 countries. Biohit co-operates with multinational companies such as Beckman Coulter, Becton Dickinson, bioMérieux, Johnson & Johnson and 3M. Biohit has been listed on the New Market (NM) -list of the Helsinki Exchanges since 1999.

[www.biohit.com](http://www.biohit.com)



Humming Bird – The sensitive and accurate qualities of the humming bird symbolize the product ranges of Biohit: Liquid handling, diagnostics, instruments, service and complete analyzing systems composed of these product groups. The products, based on the innovations and technologies of Biohit, are characterized by versatility, flexibility, power, rapidity, light weight, design, ergonomics, accuracy and precision as well as safety in delicate operations.

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# GastroPanel

## Innovation for Diagnosis of Atrophic Gastritis

As a result of decades of basic Finnish medical research, GastroPanel innovation has been developed. GastroPanel examination is performed from a blood sample revealing the status and function of the mucosa of the entire stomach. This novel method is a non-invasive, risk-free and patient-friendly alternative for gastroscopy and biopsy specimen examination. GastroPanel can be used as an initial method for examining patients suffering from dyspepsia, *Helicobacter pylori* infection and atrophic gastritis. Moreover, GastroPanel screens the risks of gastric cancer, peptic ulcer, gastroesophageal reflux disease and Barrett's esophagus.

Biohit monoclonal antibodies used in the GastroPanel ELISA tests are highly specific to their antigens. They are also applicable for immunohistochemistry as shown in figures 1-4 below, as well as for immunoprecipitation and Western blotting.

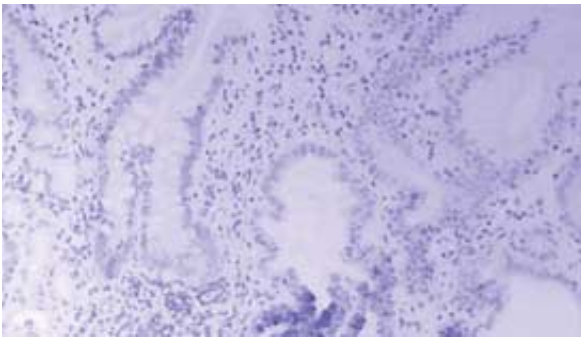


Figure 1. Pepsinogen I in severely atrophic corpus mucosa. Only some cell remnants are stained positively in the atrophic mucosa. The absence of pepsinogen secreting cells is an objective sign of severe atrophy.

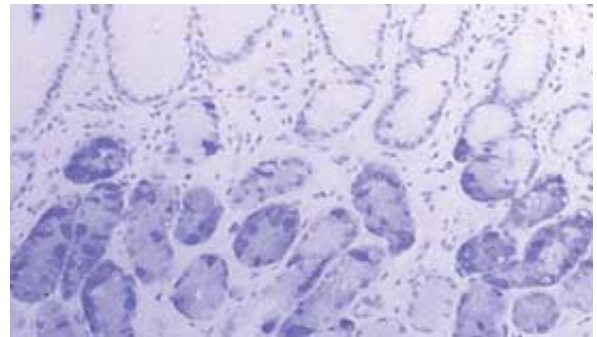


Figure 2. Gastrin-17 in normal antrum. Antral G cells (gastrin-17 secreting cells) are stained and their number is normal.

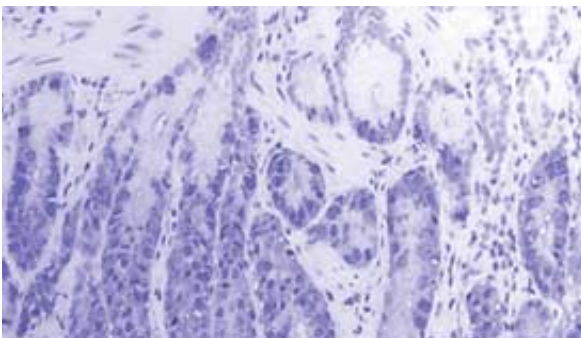


Figure 3. Gastrin-17 in antral mucosa in patients with severe atrophic gastritis in corpus and pernicious anemia. Number of G cells is increased (hyperplasia) in antrum and the cells are strongly stained.

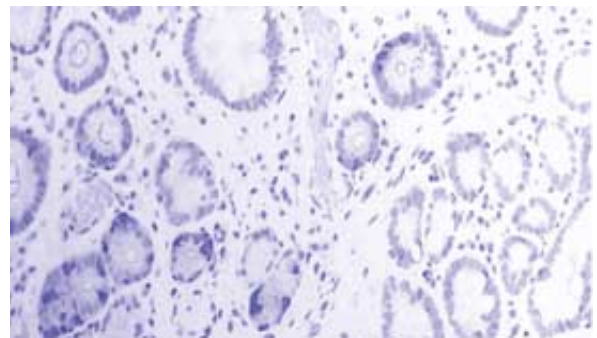
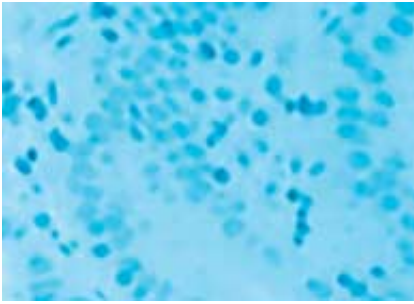


Figure 4. Gastrin-17 in mild atrophic antrum. Number of G cells has remarkably decreased compared to the state illustrated in Figure 2.



## Clinical Background

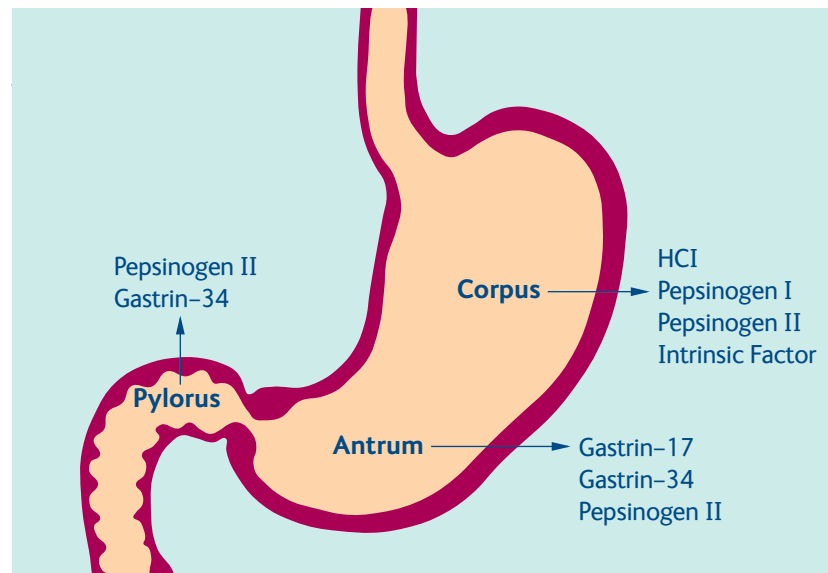
Atrophic gastritis, i.e., the inflammation and atrophy of the mucosa of the stomach, is a disease which is often symptomless or produces only unspecific symptoms. Atrophic gastritis, which may cause many diseases, develops over years or decades, and is not often diagnosed. It was earlier believed that atrophic gastritis is irreversible. Most recent studies indicate that atrophic gastritis is curable. Atrophy can be reversed if the *Helicobacter pylori* infection, which is the most common cause of atrophic gastritis, is treated in timely manner. If atrophic gastritis is diagnosed and treated the risk of gastric cancer and peptic ulcer will decrease or disappear. However, if atrophic gastritis is not diagnosed and treated, it may raise the risk of dementia, depression and polyneuropathies, as well as atherosclerosis, strokes and heart attacks due to the malabsorption of vitamin B12 and the consequent abnormalities in the metabolism of homocysteine.

*H. pylori* infection is a common chronic infection. Half of the global population is infected by *H. pylori* and suffer from related chronic gastritis. Over 20% of those infected may suffer from peptic ulcer. In nearly half of the *H. pylori* infected cases gastritis develops over the years into atrophic gastritis, which increases the risk of gastric cancer and peptic ulcer. Approximately 10% of the patients suffering from gastritis caused by *H. pylori* will develop severe atrophic gastritis of the corpus. These patients have a considerably high risk of diseases related to vitamin B12 deficiency.

**G**astroPanel examination measures the levels of pepsinogen I and II, gastrin-17 and *H. pylori* antibodies in the patient's blood sample. On the basis of the results of these ELISA tests, it is possible to determine whether the patient suffers from gastritis caused by *H. pylori*, whether the gastritis has become atrophic and in which part of the stomach the changes are (corpus, antrum or both). GastroPanel examination enables to find patients with an increased risk of stomach cancer, peptic ulcer, gastroesophageal reflux disease and Barrett's esophagus.

GastroPanel tests from a blood sample

Pepsinogen I	Biomarker for atrophic gastritis in corpus
Pepsinogen I /Pepsinogen II	Biomarker for atrophic gastritis in corpus
Gastrin-17	Biomarker for atrophic gastritis in antrum
<i>Helicobacter pylori</i> IgG antibodies	Biomarker for <i>H. pylori</i> infection

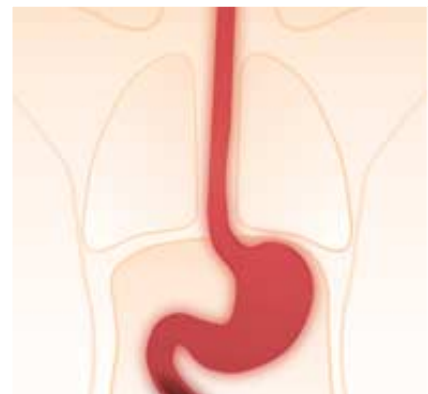


The more severe is the atrophic gastritis in the corpus mucosa of the stomach, the lower is the concentration of pepsinogen I and pepsinogen I and II ratio in the blood sample. Similarly, the more severe the atrophic gastritis in the antrum mucosa of the stomach, the lower the measured gastrin-17 concentration. The measured concentrations of pepsinogens (I and II) and gastrin-17 represent the overall condition of the mucosa of the stomach, its functional status and the severity of atrophy.

## Indications of GastroPanel

- Diagnosis of *H. pylori* infection and atrophic gastritis including the assessment of the severity and location (corpus, antrum or both) of the atrophy
- Differential diagnosis of dyspepsia
- Determination of the risks of gastric cancer, peptic ulcer, gastroesophageal reflux disease and Barrett's esophagus

Until now gastroscopy and biopsy specimen examination of the stomach mucosa have been the only way to diagnose atrophic gastritis, which often produces only few symptoms or is symptomless. GastroPanel examination gives in most cases the same results on the status and the function of the mucosa of the stomach as gastroscopy and biopsy specimen examination. However, the latter as a subjective method is dependent on the professional skills and experience of both the gastroscopist and the pathologist examining the biopsy specimens. GastroPanel is non-invasive, risk-free and comfortable for the patient giving reliable and quick results. Moreover, compared to gastroscopy and biopsy specimen examination, GastroPanel discovers even small changes in the status and the function of the mucosa of the stomach.



### Benefits

- Simple blood sample-based test
- Risk-free and comfortable for the patient
- Results available quickly for fast diagnoses
- Easy and reliable interpretation of the results with dedicated software
- Promotes selecting and prioritizing patients for gastroscopy
- Helps in gastroscopy to locate atrophy in corpus, antrum or both
- Promotes screening of patients at risk
- Promotes evidence-based medicine
- Reduces trial treatments and related problems and costs
- Improves the level of healthcare and quality of life

### Ordering information

Cat. No.	Product	Qty
601 010.01	Pepsinogen I ELISA Kit	96 tests
601 020.01	Pepsinogen II ELISA Kit	96 tests
601 030.01	Gastrin-17 ELISA Kit	96 tests
601 040.01	Helicobacter pylori IgG ELISA Kit	96 tests
601 050	Gastrin-17 Stabilizer	1 x 5,5 ml
601 051	Gastrin-17 Stabilizer	5 x 5,5 ml

In the United States and Japan: For research use only.

GastroPanel indicates the risk of peptic ulcer and gastric cancer in comparison to normal population. Patients who suffer from atrophic gastritis in the corpus have 5-fold risk of gastric cancer compared to the normal population. If the mucosa of the entire stomach (corpus and antrum) has a severe atrophic gastritis, the risk of gastric cancer is 90-fold. If the severe atrophy is located only in the antrum the risk of developing gastric cancer is 20-fold. In this case the risk of peptic ulcer is 25-fold. Gastric cancer as also atrophic gastritis in its initial stage, is in most cases symptomless or only shows slight symptoms.

GastroPanel can reveal the risk of gastroesophageal reflux disease (GERD) and Barrett's esophagus. Over half of the population has occasionally GERD symptoms. The incidence of GERD is 25 % and esophageal cancer is increasing.

Atrophic gastritis of the corpus mucosa raises the risk of the vitamin B12 deficiency, which may increase the risk of dementia, depression and polyneuropathies. Vitamin B12 deficiency is one of the reasons for increased levels of homocysteine in blood and body fluids, which can be an independent risk factor for atherosclerosis, strokes and heart attacks. Measurement of vitamin B12 and homocysteine are recommended by the GastroPanel interpretation program: GastroSoft.

# GastroPanel Interpretation: GastroSoft and GastroMap

## GastroSoft

GastroSoft is an easy-to-use software for the interpretation of the results of the GastroPanel. The final diagnosis, however, must be made based on the physical examination, medical history of the patient and any other information available to the physician.

### Results revealed by GastroSoft:

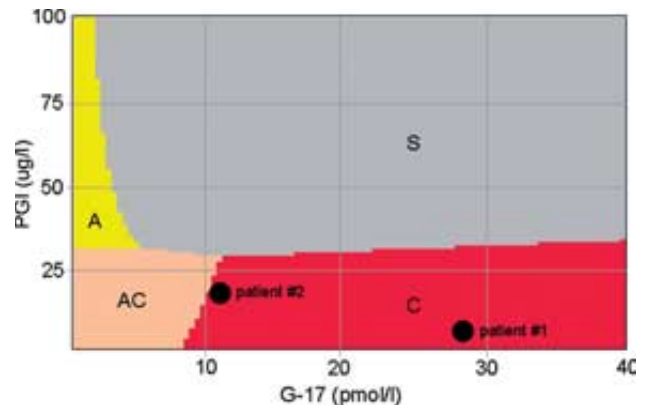
- Diagnosis of *Helicobacter pylori* infection
- Diagnosis of atrophic gastritis
- Probabilities of different conditions in the mucosa of the corpus and antrum of the stomach (normal, gastritis, atrophic gastritis)
- Risk for gastric cancer
- Risk for peptic ulcer
- Risk for esophageal reflux disease and Barrett's esophagus
- Recommendation for gastroscopy and biopsy specimen examination
- Recommendation to measure the blood concentrations of vitamin B12 and homocysteine
- If GastroPanel gives normal results, it means that the mucosa is healthy in the whole stomach, and the reason for symptoms is functional dyspepsia or some other disease.



GastroSoft Report

## GastroMap

The Biohit GastroMap is a graphical tool for the classification of atrophic gastritis. It helps to visualize, not only the most probable atrophic class, but also the other atrophic options to consider. In the adjacent figure a patient #1 was *H. pylori* positive, Pepsinogen I (PGI) = 5 µg/l, Pepsinogen II (PGII) = 2 µg/l and Gastrin-17 (G-17) = 28 pmol/l. By inserting the PGI, PGII and G-17 values on the GastroMap, the most probable class is C - atrophic gastritis in the corpus. When the point is located near some other area (see patient #2) a lower probability of the class in question is indicated. In this case the atrophic gastritis in antrum and corpus (AC) must also be considered.



GastroMap illustrates the classification of atrophic gastritis in *H. pylori* positive cases.

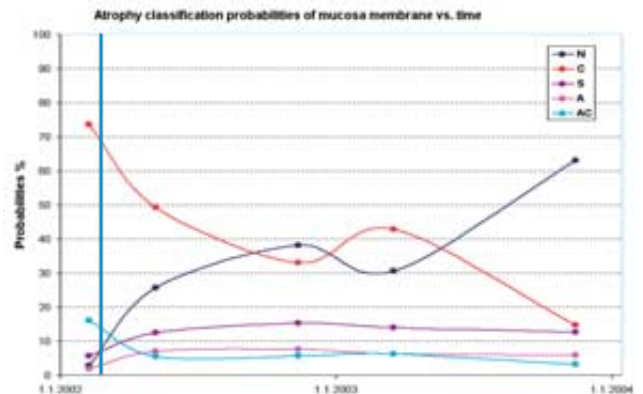
- S= non-atrophic gastritis
- AC= atrophic gastritis in antrum and corpus
- A= atrophic gastritis in antrum
- C= atrophic gastritis in corpus

## GastroPanel Interpretation as a Follow-up Tool

The adjacent figure illustrates, with an example of a patient, how the probability of corpus atrophy (C) decreases after *H. pylori* eradication (blue vertical line) in two years. Consequently, the probability of the normal status (N) of the mucosa increases.

Relative probabilities of atrophy in the corpus (C), antrum (A) as well as in both antrum and corpus (AC) serve as a means to monitor the status and healing of the stomach after *H. pylori* eradication therapy.

In the United States and Japan: For research use only.



The figure illustrates the healing of atrophic gastritis after the eradication of *Helicobacter pylori*.

# Lactose Intolerance Quick Test

Biohit Lactose Intolerance Quick Test has been developed in response to the need for an accurate and quick biochemical test. The Point of Care test enables a fast and easy diagnosis of lactose intolerance of biopsy specimens taken in connection with gastroscopy.

The Biohit Lactose Intolerance Quick Test offers a novel method for detecting lactose intolerance (hypolactasia). Lactase activity is measured by a two-step procedure from a biopsy sample taken from the small intestine. In the first step the lactase enzyme in the sample hydrolyzes the substrate, lactose, into monosaccharides, glucose and galactose. In the second reagent addition step, the amount of glucose is detected by the formation of a colored compound. The development of the color in the test liquid after 20 minutes informs whether or not the lactase enzyme is present in the biopsy specimen. In case of normolactasia, the color develops as the lactase enzyme of the biopsy specimen breaks down the milk sugar (lactose) added to the test buffer. If there is no or only a slight color development it can be concluded that the patient suffers from the deficiency of lactase enzyme in the mucosa of the small intestine, i.e., lactose intolerance.



## Ordering information

Cat. No.	Product	Qty
602 010	Biohit Lactose Intolerance Quick Test Kit	25 tests

In the United States and Japan: For research use only.



## Clinical Background

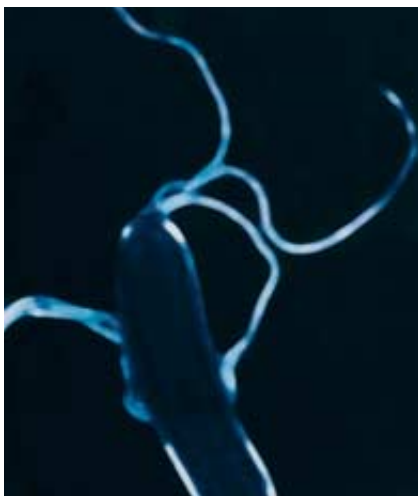
Lactose intolerance (hypolactasia) results in the inability to digest lactose (milk sugar) in milk products. This inability results from a shortage of the lactase enzyme, which is produced in the small intestine. Lactase breaks down milk sugar into simpler forms (glucose and galactose), which can then be absorbed into the bloodstream. Approximately 15–20% of Western and Northern Europeans, and 90% of Asians, Africans and native Americans suffer from lactose intolerance.

Patients seeking medical treatment due to stomach disorders are often directed to gastroscopy. However, lactose intolerance cannot be diagnosed on the basis of gastroscopy alone. The lack of the lactase enzyme must be determined biochemically from a biopsy specimen or on the basis of a lactose tolerance or breath test. All these tests are time-consuming and strenuous for the patient. Biohit Lactose Intolerance Quick Test enables to find quickly patients suffering from lactose intolerance.

## Benefits

- Biopsy can be tested immediately
- No instruments needed
- Measures lactase activity directly
- Simple two-step procedure
- All reagents are ready for use
- Easy visual interpretation
- Results in 20 minutes

# Helicobacter Pylori Quick Test



## Clinical Background

*Helicobacter pylori* is a spiral-shaped, gram-negative bacterium that colonizes the human stomach. The organism is found in the mucous layer of the stomach overlying the gastric epithelium and it does not appear to invade tissue. *Helicobacter pylori* infects usually in childhood in person-to-person transmissions. Approximately half of the global population is infected by *Helicobacter pylori*.

The mucosa underneath the area of *Helicobacter pylori* colonization is invariably inflamed. This condition is referred to as chronic superficial or non-atrophic gastritis, which, if untreated, persists for life. The chronic inflammatory process can develop into atrophic gastritis, which may lead to peptic ulcer and gastric cancer, two of the most common diseases of the upper gastrointestinal tract.

Biohit Point of Care *Helicobacter Pylori* Quick Test enables a fast diagnosis of the patients suffering from *Helicobacter pylori*. The test is based on a biochemical reaction to qualitatively determine *Helicobacter pylori* induced urease activity from biopsy specimens taken in connection with gastroscopy.

Biohit *Helicobacter Pylori* Quick Test offers a simple and highly specific method for detecting *H. pylori* in connection with gastroscopy. *H. pylori* can be diagnosed with various methods. The quick urease test is the least expensive test method, which can be performed on endoscopic antrum and corpus biopsy specimens at the site of gastroscopy. The biopsy specimen taken from the stomach is examined immediately after gastroscopy. The development of the color in the test gel after 1-2 minutes informs whether or not *H. pylori* and its urease enzyme is present in the biopsy sample.



## Benefits

- Biopsy specimen can be tested immediately
- Simple procedure
- No reagents needed
- Highly specific
- Easy visual interpretation
- Results in 1-2 minutes

## Ordering information

Cat. No.	Product	Qty
602 015	Biohit <i>Helicobacter Pylori</i> Quick Test Kit	50 tests

In the United States and Japan: For research use only.

# Celiac Disease Panel

Biohit Celiac Disease Panel is intended for the diagnosis and treatment follow-up of celiac disease and dermatitis herpetiformis. The test panel consists of ELISA kits for Anti-Gliadin IgA and IgG, Anti-Transglutaminase IgA and IgG, and immunofluorescence assay (IFA) kit for Anti-Endomysium IgA.

Biohit ELISA kits for Anti-Gliadin IgA and IgG and Anti-Transglutaminase IgA and IgG as well as immunofluorescence assay (IFA) for Anti-Endomysium IgA are sensitive screening tests for patients with suspected celiac disease. The Anti-Gliadin IgA and IgG tests are intended for the determination of human Anti-Gliadin IgA and IgG antibodies in serum. The tests are also useful in the screening of dermatitis herpetiformis. The Anti-Transglutaminase IgA and IgG ELISA kits, based on human recombinant tissue transglutaminase (tTG), are sensitive and specific tests measuring IgA and IgG celiac antibodies. Biohit Anti-Endomysium IgA IFA-kit is intended for the determination of human Anti-Endomysium IgA in serum.



## Ordering information

Cat. No.	Product	Qty
602 020	Anti-Gliadin IgG ELISA Kit	96 tests
602 030	Anti-Gliadin IgA ELISA Kit	96 tests
602 040	Anti-Transglutaminase IgA ELISA Kit	96 tests
602 055	Anti-Transglutaminase IgG ELISA Kit	96 tests
602 050	Anti-Endomysium IgA (hUC) IFA Kit	48 tests

In the United States and Japan: For research use only.



## Clinical Background

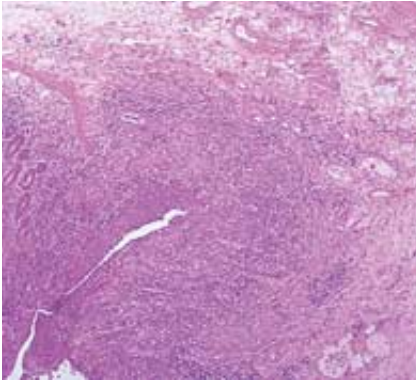
Autoimmune diseases are increasing in our society. It has, e.g., recently been confirmed that celiac disease is much more common than thought earlier. Celiac disease is characterized by the presence of villous atrophy in a jejunal biopsy specimen. The disease is caused by hypersensitivity to gluten. Withdrawal of gluten from the diet cures the patient. The overall lifetime incidence of celiac disease has been estimated to be 1:100 – 1:300.

Untreated celiac disease can cause osteoporosis, anemia, infertility and neurological disorders. Patients with untreated celiac disease have a ten times higher risk for malignant intestinal lymphoma. In older children and adults typical symptoms are rarely seen. Therefore, reliable methods for screening of celiac disease have been searched from the beginning of 1970's. During the last few years it has become evident that the determination of gliadin and transglutaminase antibodies in the serum offers a convenient non-invasive laboratory method for this purpose.

## Benefits

- Highly specific and sensitive
- Easy to perform and use at the same time
  - Same wash buffer in all tests
  - Same sample dilution buffer in all tests
  - Short incubation times

# Inflammatory Bowel Disease Panel



Biohit Inflammatory Bowel Disease Panel is intended for the detection and differentiation of Crohn's disease and ulcerative colitis. The test panel consists of ELISA kits for Anti-Saccharomyces IgA and IgG (ASCA) and immunofluorescence assay (IFA) kit for antineutrophil cytoplasmic antibodies (ANCA).

## Clinical Background

Over a million individuals in the United States and Europe suffer from non-specific inflammatory bowel disease (IBD), a chronic relapsing, inflammatory intestinal condition. IBD patients may have a variety of symptoms including diarrhea, abdominal pain and rectal bleeding. Weight loss is common. The two major forms of IBD are Crohn's disease and ulcerative colitis. In Western Europe the incidence of Crohn's disease is 5-7/100 000 and the incidence of ulcerative colitis 6-12/100 000. Patients with ulcerative colitis and Crohn's disease are at a higher risk of colorectal cancer.

Since specific symptoms are lacking the differential diagnosis is difficult, requiring time consuming and expensive invasive techniques. However, serological markers offer a substantial aid in the diagnosis of IBD. Antineutrophil cytoplasmic antibodies (atypical p-ANCA) have been found in patients with ulcerative colitis (in 70%) while both IgG and IgA antibodies against the cell wall mannan of *Saccharomyces cerevisiae* (ASCA) are associated with Crohn's disease (in 50-80%).

Biohit ASCA IgA and IgG ELISA kits detect qualitatively or semi-quantitatively IgA and IgG class Anti-Saccharomyces cerevisiae antibodies (ASCA) in human serum. The tests are intended to aid in the diagnosis of patients with Crohn's disease. When using both IgA and IgG ASCA ELISA tests together, there is a marked increase in sensitivity. Moreover, when used in combination with Biohit ANCA test, they are useful in the differential diagnosis between ulcerative colitis and Crohn's disease.

Biohit ANCA immunofluorescence assay (IFA) kit is intended for the in vitro diagnostic detection of antineutrophil cytoplasmic antibodies in human serum using ethanol fixed and formalin fixed human neutrophils as substrates. Atypical p-ANCA, which is anti-myeloperoxidase (MPO) negative, is a serological marker for ulcerative colitis. When used in combination with Biohit ASCA IgA and IgG kits, atypical p-ANCA is a useful aid in the differential diagnosis between ulcerative colitis and Crohn's disease.



## Benefits

- Highly specific and sensitive
- Easy to use and automate
- Short incubation times

## Ordering information

Cat. No.	Product	Qty
602 060	Anti-Saccharomyces IgG (ASCA) ELISA Kit	96 tests
602 065	Anti-Saccharomyces IgA (ASCA) ELISA Kit	96 tests
602 052	ANCA IFA Kit	60 tests

In the United States and Japan: For research use only.

# Systemic Lupus Erythematosus Test

Biohit has developed a unique method for diagnosing systemic lupus erythematosus (SLE). The Anti-dsDNA IgG ELISA test of Biohit measures, by a sensitive and specific enzyme immunoassay procedure, telomere antibodies in the serum of a SLE patient.



Biohit Systemic Lupus Erythematosus Test is based on the use of the double-stranded telomeric DNA as the capture antigen for the binding of SLE antibodies. Telomeres, which represent 0.15 % of the human genome, are highly repetitive sequences of the DNA (TTAGGG/CCCTAA)<sub>n</sub> at the end of eukaryotic chromosomes. Human antibodies against telomeric DNA have proven to be a specific and sensitive test for SLE. As SLE resembles autoimmune rheumatic diseases the Biohit SLE test can be used in the differential diagnosis of SLE and, e.g., rheumatoid arthritis, as well as in the assessment of the clinical activity of SLE.

## Clinical Background

Systemic lupus erythematosus (SLE) is a typical autoimmune disease, which affects almost every organ of the body and which, with its various symptoms, resembles rheumatic diseases. Although SLE mainly affects women, also men and even children can be affected. Common disorders related to SLE are malar rash, discoid rash, sensitivity to sunlight, oral ulcers, arthritis, serositis, kidney problems (e.g. proteinuria), problems related with the central nervous system, blood circulation, the immune system, as well as antinuclear antibodies. Approximately 2% of the global population suffer from rheumatic diseases and 0.1 – 0.4% from SLE.

On the basis of the titers of telomere antibodies it is possible to distinguish SLE, e.g., from rheumatoid arthritis. The observation that telomerase activity is detected in 85% of all cancers has made the telomerase enzyme a new cancer marker and added special interest on telomere research itself.



## Ordering information

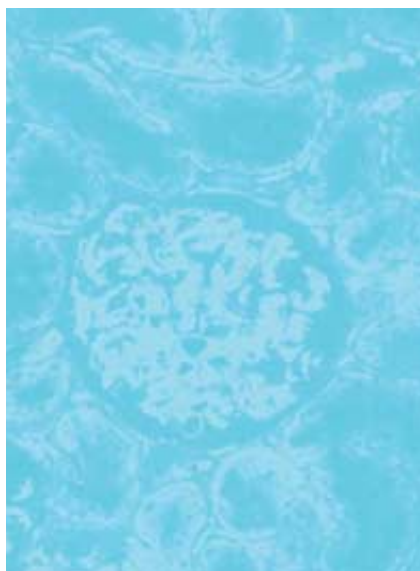
Cat. No.	Product	Qty
604 010	Anti-dsDNA IgG ELISA Kit	96 tests

In the United States and Japan: For research use only.

## Benefits

- High affinity to anti-dsDNA
- Increased specificity  
(human DNA sequence as a capture antigen)
- Reduced background, no cross-reactions
- High reproducibility
- Easily automated

# Monoclonal Antibodies



**B**iohit monoclonal antibodies are an efficient tool for research in the area of cellular pathology, neurobiology and oncology as well as in the research of human gastric biomarkers. The monoclonal antibodies of Biohit are produced in mouse, and have been purified after production. They are highly specific to their antigens, and applicable for immunohistochemistry, immunoprecipitation, Western blotting and immunoassay technology. Biohit produces monoclonal antibodies to Human Gastric Biomarkers, Phytoestrogen Genistein, Human Extracellular Matrix Components, Human Integrins, Human Endothelial Cell Surface Marker, Human Neurotransmitter Substances, Human Cytoskeletal Polypeptides and Human Spectrins.

\*Biohit monoclonal antibodies are applicable in:  
 IHC = Immunohistochemistry  
 WB = Western blotting  
 IP = Immunoprecipitation  
 EIA = Enzyme Immunoassay  
 FIA = Time-resolved Fluorescence Immunoassay

Specificity	Clone	Applications*	Qty	Cat. No.
<b>Monoclonal Antibodies to Human Gastric Biomarkers</b>				
Pepsinogen I	4C6.1	IHC, EIA	100 µg	610055
Pepsinogen II	L10CC10	IHC, EIA	100 µg	610056
Gastrin-17	G52C7.1	IHC, EIA	100 µg	610057
<b>Monoclonal Antibody to Phytoestrogen</b>				
Genistein	L22FA2	EIA, FIA	100 µg	610058
<b>Monoclonal Antibodies to Human Extracellular Matrix Components</b>				
Cellular Fibronectin (cFn)	DH1	IHC, WB, EIA	100 µg	610001
Tenascin-C	EB2	IHC, WB, EIA	100 µg	610002
Tenascin-C	DB7	IHC, WB	100 µg	610003
Laminin (β1-chain)	DG10	IHC, WB	100 µg	610004
Laminin (γ1-chain)	BC17	IHC, IP	100 µg	610005
Plasma Fibronectin (pFn)	BF12	IHC, WB	100 µg	610006
Vitronectin	BE10	IHC, WB	100 µg	610007
<b>Monoclonal Antibodies to Human Integrins</b>				
β1-Integrin	DF5	IHC, WB	100 µg	610008
β1-Integrin	DF7	IHC, WB	100 µg	610009
β3-Integrin	BB10	IHC, WB	100 µg	610010
αIIb-Integrin	CA3	IHC, WB	100 µg	610011
<b>Monoclonal Antibodies to Human Endothelial Cell Surface Marker</b>				
PECAM-1	CE6	IHC, WB	100 µg	610027
<b>Monoclonal Antibodies to Human Neurotransmitter Substances</b>				
GABA	5A9	IHC, EIA	100 µg	610025
CGRP	CD8	IHC, WB, EIA	100 µg	610026
<b>Monoclonal Antibodies to Human Cytoskeletal Polypeptides</b>				
α-Actinin	CB11	IHC, WB	100 µg	610012
α-Fodrin	AA6	IHC, WB	100 µg	610013
Vinculin	FB11	IHC, WB	100 µg	610014
Cytokeratin 18	4B11	IHC, WB, IP	100 µg	610015
Cytokeratin 8,18,19	2A4	IHC, WB	100 µg	610016
Cytokeratin 7,17,19	4F5	IHC, WB	100 µg	610017
Vimentin	65E	IHC, WB	100 µg	610018
Desmin	37EH	IHC, WB	100 µg	610020
Neurofilaments 150,200	13AA	IHC, WB	100 µg	610021
Neurofilaments 70,200	14BA	IHC, WB	100 µg	610022
<b>Monoclonal Antibodies to Human Spectrins</b>				
Erythroid α-Spectrin	AF10	IP, WB, IHC	100 µg	610023
Erythroid β-Spectrin	DB2	IP, WB, IHC	100 µg	610024

# Instruments

## Complete Analysing Systems for Laboratories

Biohit range of instruments comprises microplate readers and washers, and related software. The instruments have on board data reduction software or can be fully computer controllable. This ensures ease-of-use, optimal operation and verified test reporting and results. The multichannel pipettors, microplate readers and washers offered by Biohit form comprehensive analyzing systems for a wide range of assays in the field of research and clinical routines.

### Historical Background

Already in the 1970s the current management and key personnel of Biohit developed and commercialized the inventions made by Professor Osmo Suovaniemi, M.D, Ph.D, the founder of the Finnish companies, Labsystems (1971), Eflab (1978) and Biohit (1988):

1. 9-, 8- and 12-channel adjustable pipettors for microplates
2. 3x3- and 8x12-well microplates with a flat, optical window in the bottom of a well as a solid phase in immunoassays
3. Vertical measurement principle (the vertical light path photo-, turbido-, fluoro- and luminometry), and the instrument applications for this invention, such as the very first 96-well microplate reader Titertek Multiskan (1978)
4. Microplate-based enzyme immunoassays, such as the test kits for the diagnosis and screening of colorectal cancer and HIV as well as the test kits for the TORCH-panel in the early 1980s

Since the end of the 1980s Biohit has developed further the vertical measurement principle and its microplate applications. The instruments and analyzing systems based on multichannel liquid handling and the vertical measurement principle have enabled the extensive research and fast development of the new immunoassay techniques, e.g., test kits for cancer and infectious diseases. During the past ten years, these safe and reliable immunoassays (e.g., EIA, FIA and LIA) have been followed by the rapid development of the multichannel pipettors, microplates and vertical measurement principle utilizing techniques, such as the polymerase chain reaction (PCR) and high throughput screening (HTS).

The innovations related with the multichannel liquid handling, microplates and the vertical measurement principle have been utilized so extensively and successfully, that they can justifiably be called global industrial standards. These innovations have also revolutionized laboratory routines worldwide.



### BP 800 Microplate Reader

The BP 800 Microplate Reader has all the features of a modern microplate photometer providing readily programmed (optional) assay protocols for Biohit diagnostics. With the help of the intuitive user interface, new test protocols can be made fast and easily. Extensive on-board data reduction surpasses many personal computer software packages with its extensive curve-fitting, cut-off calculation, data transformation and validation capabilities. In addition to the printer interface, the instrument has a serial interface to be controlled with a personal computer for further processing and distribution of data.



### BP 808 Microplate Reader

The BP 808 Microplate Reader is a 8-channel microplate photometer with four-zone incubation to 50 °C. Due to the fast reading capability the unit is suitable for end-point kinetic applications. With the help of the intuitive user interface, new test protocols can be made fast and easily. Extensive on-board data analysis includes several curve-fitting options, transformations and control validation. In addition to the printer interface, the instrument has a serial interface to be controlled with a personal computer for the further processing and distribution of data. The product can be delivered as ready programmed assay protocols for Biohit diagnostics.



### BW 50 Microplate Strip Washer

The BW 50 is a self-contained and programmable microplate washer suitable for EIA, FIA, RIA, DNA probe and cellular assays. It allows full control of precise fluidic delivery from the gentle dripping of a simple squeeze bottle to the full force of pressure delivery systems. The instrument can be delivered pre-programmed for Biohit diagnostic kits.



### e-Lisa XL Reader Software

e-Lisa XL is the most easy-to-use, yet useful software utility for supporting the Biohit microplate readers with end point type assays such as the Biohit GastroPanel: Pepsinogen I and II, Gastrin-17 and *Helicobacter pylori* or other Biohit ELISA based tests. It has been designed to be used together with Microsoft Excel™, providing numerous possibilities for data processing needs. The e-Lisa XL is delivered with Excel templates for Biohit assays.

#### Ordering information

Cat. No.	Product
740 030	BP800 Microplate Photometer
740 031	BP800 Microplate Photometer 340 nm (UV)
740 032	BP800 Microplate Photometer 384 (NB)
740 040	BP808 Microplate Photometer
740 041	BP808 Microplate Photometer (UV, I)
740 050	BW50/8 Microplate Strip Washer
740 051	BW50/16 Microplate Strip Washer 384
740 052	BP50/12 Microplate Strip Washer
740 053	BP50/8V Microplate Strip Washer

#### Ordering information

Cat. No.	Product
740 190	e-LISA XL Reader Elisa Utility Software
740 191	KC Junior Basic Data Analysis Software
740 192	KC4 Advanced Data Analysis Software
740 193	GastroSoft

More information about Biohit instruments can be found at [www.biohit.com](http://www.biohit.com)

# Biohit Service Laboratory

Biohit service laboratory promotes the evaluation and adoption of Biohit's diagnostic tests and analyzing systems. Biohit service laboratory engages in the research and development of diagnostic tests and the analysis of different types of patient data in co-operation with scientific communities in Finland and abroad.

The purpose of the Biohit service laboratory is to collect patient samples, e.g., from health care and occupational health service centers, other medical centers as well as regional and central hospitals. Furthermore, the purpose is to encourage the users of the laboratory service to begin making the necessary analyses themselves with the help of the analyzing systems purchased from Biohit. This enables the customer to receive the test results more easily, rapidly and at a lower cost.

The performance of the analyses as close as possible to the patient and doctor promotes decentralized laboratory diagnostics, which is usually the most optimal, and, thus, the most recommendable way. Decentralized laboratory diagnostics which promotes evidence-based medicine should be striven for not only for the benefit of the patient and the doctor but also since it decreases the costs of health care.

## Analyses performed by Biohit service laboratory:

- GastroPanel examination
  - *Helicobacter pylori* IgG
  - Pepsinogen I
  - Pepsinogen II
  - Gastrin-17
- Vitamin B12
- Folate
- Folate from erythrocytes
- Celiac Disease Panel
- Inflammatory Bowel Disease Panel
- Cellular fibronectin
- Telomere-DNA IgG –antibodies
- Determination of lactase, saccharase and maltase from biopsies of the small intestine

Additional information and instructions for taking and delivering the samples to Biohit service laboratory can be ordered from Biohit Plc, Helsinki, Finland  
e-mail: [servicelaboratory@biohit.com](mailto:servicelaboratory@biohit.com),  
tel: +358 9 773 861 or fax: +358 9 773 2867.



# Collaboration and Licencing Opportunities

Successful collaboration with biotechnology companies and academic centres as well as the licencing of the innovative diagnostic products and technologies play a key role in achieving the set targets. For more information on collaboration and licencing opportunities, please contact: Biohit Plc, Helsinki, Finland. Tel. +358 9 773 861, Fax. +358 9 773 86 200 or e-mail: [info@biohit.com](mailto:info@biohit.com).



## GastroPanel

Biohit GastroPanel examination comprises ELISA assays for *H. pylori*, Pepsinogen I, Pepsinogen II and Gastrin-17. GastroPanel enables the screening and diagnosis of *H. pylori* infection and atrophic gastritis from a blood sample. US patent 6,696,262, FI patents 97304 and 107808. EP patent 0804737. JP patent 3433231. RUS patents 2224258 and 2225615. Other patents pending.



## Lactose Intolerance Quick Test

Biohit Lactose Intolerance Quick Test at gastroscopy enables a fast diagnosis of the patients suffering from lactose intolerance. The test is easy-to-use, highly sensitive and specific. FI patent 106212, EP patent 1173607. RUS patent 222350. CHN patent 00806948.4.



## Systemic Lupus Erythematosus Test

Biohit Anti-dsDNA kit is a specific assay for screening systemic lupus erythematosus (SLE). The ELISA assay uses telomeric DNA as a capture antigen. US patent 5,700,641. EP patent 0812421. Other patents pending.



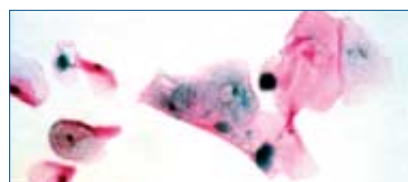
## Monoclonal Antibodies

Biohit has 30 specific mouse monoclonal antibodies, which are applicable in immunohistochemistry, immunoprecipitation, Western blotting and immunoassay method. The characterization of most antibodies has been made with human frozen sections. Biohit has concentrated on extracellular matrix proteins, their receptors and cytoskeletal proteins which can be used in cancer research.



## Cellular fibronectin ELISA Test

The cFn-ELISA test developed by Biohit enables to trace cancers of gastric or large intestine origin by measuring the level of EDA cFn in blood. Fibronectins are adhesive glycoproteins that have a role in a variety of cell contact processes, cell differentiation, and oncogenic transformation. When cancer is developing in the gastrointestinal tract the concentration of extra domain A- cellular fibronectin (EDAcFn) in blood increases in certain cases. US patent 5,420,012. EP patent 0399271.



## Genetic Probes

Biohit has developed several viral genetic probes, such as Human Papilloma virus (HPV 6, 11,16,18,31 and 33), Cytomegalo virus (CMV) and Epstein-Barr virus (EBV) probes. These pBR322 plasmid DNA probes in *E.coli* bacteria can be labelled and used e.g. for the detection of these viruses from cytological smears, paraffin-embedded and frozen biopsies.

## Products Under Development

### Cyclooxygenase

Epidemiological studies have shown that the use of nonsteroid anti-inflammatory drugs (NSAIDs) are associated with reduced risk of digestive tract cancers. The best-known target of NSAIDs is the cyclooxygenase (COX) enzyme. It has been demonstrated that the expression of COX-2 is elevated in gastric cancer and in dysplastic precursor lesions of this disease. The expression of COX-2 correlates with a reduced survival in patients suffering from esophageal, gastric and colorectal carcinoma. Thus, COX-2 is a promising novel tumor marker in gastric cancer. US patent 6,416,961. RUS patent 2204835. Other patents pending.

### Acetaldehyde and Cysteine

Excessive alcohol consumption and heavy smoking are main risk factors of upper digestive tract cancer. Acetaldehyde is a local and topical carcinogen. Oral microbes produce acetaldehyde from ingested alcohol in the saliva. A special slow-releasing buccal cysteine tablet removes up to two-thirds of carcinogenic salivary acetaldehyde. Accordingly, buccal cysteine tablet can potentially be used to prevent upper gastrointestinal tract cancers, especially among high-risk individuals. Patents pending in several countries.

### Single Nucleotide Polymorphisms

There are several excellent tools for large-scale genotyping of single nucleotide polymorphisms (SNPs). Biohit has developed a technology that can be used as a platform for simple SNP analysis. Unlike in methods based on DNA array technology, the Biohit method is very flexible. Due to the homogeneous nature of the assay platform, no solid phase binding or washing steps are required. Patents pending in several countries.

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