



# INSTRUCTION MANUAL

REF 4020

February 23, 2007

## BiermAK Dot

- 24x2 determinations -



IVD *In vitro* diagnostic device

Immunodots for the determination of IgG antibodies to intrinsic factor and antigens of parietal cells in human serum or plasma

<b>REF</b>	Catalogue number	<b>LOT</b>	Batch code
	Consult accompanying documents		Manufactured by
	Temperature limitation		Use by
	Consult operating instruction		Biological risk



**GA GENERIC ASSAYS GmbH**

Ludwig-Erhard-Ring 3

15827 Dahlewitz, Germany

Telephone: +49 (0) 33708 – 9286 – 0

Fax: +49 (0) 33708 – 9286 – 50

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

### INTENDED USE

**BiermAK Dot is used for the qualitative determination of autoantibodies to intrinsic factor and parietal cell antigens in human serum or plasma.**

Chronic atrophic gastritis of type A (5% of all forms) is characterized by autoimmune processes that lead to the destruction of parietal cells and the production of autoantibodies to both parietal cells and their product intrinsic factor (IF).

IF, a glycoprotein containing sialic acid, plays an important role in the absorption of vitamin B<sub>12</sub> (extrinsic factor) in the digestive tract. Following secretion into the stomach by parietal cells IF binds to vitamin B<sub>12</sub> ingested with food. The vitamin B<sub>12</sub>-IF complex is absorbed in the ileum by binding to a receptor specific to IF. After absorption vitamin B<sub>12</sub> is released into the blood stream where it binds to transcobalamin.

Reduced production of IF and/or impairment of its transport function bring about a deficiency in vitamin B<sub>12</sub> that leads to the development of Biermer's anemia (pernicious anemia).

The main antigen of autoantibodies to parietal cells is the membrane H<sup>+</sup>/K<sup>+</sup> ATPase transporting H<sup>+</sup> into the stomach. Antibodies to this ATPase are a sensitive marker for type A gastritis and will be found in 80-90% of such patients. Type A gastritis occurs frequently in context with other autoimmune endocrinal disorders (e.g. Hashimoto's thyroiditis, Addison's disease, insulin-dependent diabetes mellitus). Patients suffering from type A gastritis face an elevated risk of carcinoma.

Autoantibodies to intrinsic factor are detected mainly in patients with pernicious anemia associated with gastritis and are pathognomonic for this clinical picture. According to their binding sites autoantibodies to IF are divided into two types. Type 1 autoantibodies interact with the binding site for vitamin B<sub>12</sub> and, therefore, interfere with the binding of vitamin B<sub>12</sub> to the IF in the stomach. Otherwise, type 2 autoantibodies block the binding of both IF and vitamin B<sub>12</sub>-IF complexes to the specific receptor in the ileum by reacting with the corresponding site on the IF.

In contrast to RIA methods BiermAK Dot determines both types of autoantibodies to IF and is not influenced by high concentrations of vitamin B<sub>12</sub> in the sample.

Waters HM, Dawson DW, Horwarth JE, Geary CG: High incidence of type II autoantibodies in pernicious anaemia. J Clin Pathol 1993, 46, 45-7

### PRINCIPLE of the TEST

BiermAK Dot is a sensitive immunodot assay for the determination of IgG antibodies to intrinsic factor and antigens of parietal cells in human serum or plasma, respectively.

BiermAK Dot includes 24 numbered test strips with dots fixed on a plastic support: 2 dots are coated with purified antigens: intrinsic factor and H<sup>+</sup>/K<sup>+</sup> ATPase, respectively. Two test dots serve as positive and negative controls.

Patient sera and strips are incubated in the test tray. During the first incubation antibodies of the patient sample bind to the target autoantigens immobilized on the solid-phase of the strips. Following an incubation period of 30 min unbound serum components are removed by a washing step.

Bound antibodies react specifically with anti-human-IgG conjugated to alkaline phosphatase. Following an incubation period of 30 min excessive conjugate is separated from the solid-phase immune complexes by an additional washing step.

Alkaline phosphatase converts the colourless substrate solution into a dark purple precipitating dot. After 10 - 12 minutes while shaking the reaction is stopped by a washing step.

Strips are dried for at least 30 min by pressing the reactive side onto absorbent paper. Results are regarded to be positive if the colouration of the test dot is more intense than the colouration of the negative control.

## PATIENT SAMPLES

### Specimen collection and storage

Blood is taken by venipuncture. Serum is separated after clotting by centrifugation. Plasma can also be used.

The samples may be kept at 2 - 8 °C for up to three days. Long-term storage requires - 20 °C.

Repeated freezing and thawing should be avoided. If samples are to be used for several assays, initially aliquot samples and keep at - 20 °C.

### Preparation before use

Allow all components to reach room temperature prior to use in the assay. Take care to agitate serum samples gently in order to ensure homogeneity.

## TEST COMPONENTS for 24x2 determinations

<b>A</b>	<b>Dot strips</b>	24
<b>24</b>	24 numbered strips coated with specific antigens Intrinsic Factor (porcin), H <sup>+</sup> K <sup>+</sup> -ATPase (alpha, beta-subunit; porcin) - Positive control - Negative control	dot strips for the determination of two antibody specificities each
<b>B</b>	<b>Wash buffer</b>	40 ml
<b>BUF</b> <b>WASH</b>	sufficient for 400 ml solution (colourless)	concentrate capped blue
	<b>10x</b>	
<b>C</b>	<b>Sample diluent</b>	40 ml
<b>DIL</b>	(coloured yellow)	capped yellow
<b>D</b>	<b>Conjugate</b>	40 ml
<b>CONJ</b>	anti-human-IgG (goat) coupled with alkaline phosphatase (coloured red)	ready for use capped red
<b>E</b>	<b>Substrate</b>	40 ml
<b>SOLN</b> <b>NBT/BCIP</b>	nitroblue tetrazolium with bromo-chloro-indolyl-phosphate (black bottle)	ready for use capped black
<b>F</b>	<b>Incubation tray for 8 strips</b>	3 x

### Materials required

- micropipette 100 - 1000 µl
- micropipette 10 - 100 µl
- pipette tips
- graduated cylinders
- distilled or deionised water
- plate shaker
- plastic pincers
- paper towel

### Size and storage

BiermAK Dot has been designed for 24 x 2 determinations.

The expiry date of each component is reported on its respective label, that of the complete kit on the box label.

Upon receipt all components of the BiermAK Dot have to be kept at 2 - 8 °C, preferably in the original kit box.

After opening all kit components are stable for at least 2 months, provided proper storage.

### Preparation before use

Allow all components to reach room temperature prior to use in the assay.

Prepare a sufficient amount of wash solution by diluting the concentrated washing buffer 10 times (1 + 9) with deionised or distilled water. For example, dilute 10 ml of the concentrate with 90 ml of deionised or distilled water.

For each test strip 15 ml of washing buffer are requested.

The wash solution prepared is stable at 2 - 8 °C up to 30 days.

All other components are ready for use and so stable until the expiry date.

Avoid exposure of the substrate solution to light.

After each filling of wells with solution, agitate the incubation tray manually to ensure strips are completely immersed and to remove air bubbles which may be trapped under the strip.

## ASSAY PROCEDURE

1. Bring all reagents to room temperature (RT) (18-25°C) before use. Mix gently without causing foam.
2. Place the strips with the reactive side up (labels on top) into the respective well. Dispense 2 ml of wash solution (made of B) into the respective wells.
3. Cover tray, incubate **10 min** at RT (18-25°C) while shaking.
4. Discard wash solution. (Discard the solution in the wells by slowly inverting the plate. Dry the edges of the tray with absorbent paper in order to remove the remaining fluid.)
5. Add **1.5 ml** sample diluent (C) and **10 µl** patient serum or plasma to the respective wells.
6. Cover tray and incubate **30 min** at RT (18-25°C) while shaking.
7. Decant or aspirate, wash each well **three times three minutes** with **1.5 ml** wash solution (made of B) while shaking. (Discard the solution in the wells by slowly inverting the plate. Dry the edges of the tray with absorbent paper in order to remove the remaining fluid.)
8. Add 1.5 ml conjugate (D) to each well
9. Cover tray and incubate **30 min** at RT (18-25°C) while shaking.
10. Decant or aspirate, wash each well **three times three minutes** with **1.5 ml** wash solution (made of B) while shaking. (Discard the solution in the wells by slowly inverting the plate. Dry the edges of the tray with absorbent paper in order to remove the remaining fluid.)
11. Add **1.5 ml** of substrate (E) to each well.
12. Cover plate, incubate **10-12 min** while shaking.
13. Decant or aspirate, wash each well **once three minutes** with wash solution (made of B) while shaking to stop the reaction. (Discard the solution in the wells by slowly inverting the plate. Dry the edges of the tray with absorbent paper in order to remove the remaining fluid.)
14. Collect the strips from the wells and dry the membranes by pressing briefly the reactive side of the strip onto absorbent paper. After approximately 30 min the strips are to be interpreted.

## EVALUATION OF RESULTS

### Evaluation:

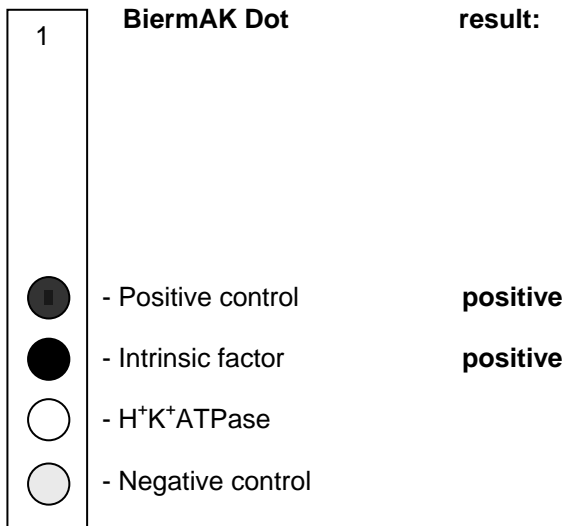
Results should be interpreted only after strips have been dried for at least 30 minutes.

The **positive control** must be positive in all cases. The colouration of the dot ensures that the test has been run correctly and the kit components are not degraded. If the positive control dot shows no colouration the results cannot be interpreted.

The **negative control** demonstrates the extent of non-specific antibody binding of the sample in the test. The colouration of the dot corresponds to the minimal intensity above which a sample is considered positive.

The test dots are coated with autoantigens and detect specific antibody binding of the sample in the test. The colour intensity of the test dot depends on the titer of specific antibody binding in the sample. The patient sample is positive concerning a certain antibody if the test dot colouration is stronger (more intense) than the negative control.

### Test example



#### Positive result:

A sample is considered to be positive for autoantibodies to intrinsic factor and H<sup>+</sup>K<sup>+</sup>ATPase if the colouration of the test dot is more intense than the colouration of the negative control.

The colour intensity of the negative dot depends on the test conditions (e.g. incubation times, temperature, washing efficiency) and on the composition of each individual sample.

#### Negative result:

A sample is considered to be negative for autoantibodies to intrinsic factor and H<sup>+</sup>K<sup>+</sup>ATPase if the colouration of the test dot is less intense than the colouration of the negative control.

## Limitations of Method

Healthy individuals should be tested negative by the BierMAK Dot. However, intrinsic factor and H<sup>+</sup>K<sup>+</sup>ATPase autoantibody positive apparently healthy individuals do occur.

Any clinical diagnosis should not be based on the results of in vitro diagnostic methods alone. Physicians are supposed to consider all clinical and laboratory findings possible to state a diagnosis.

## CHARACTERISTIC ASSAY DATA

### Specificity and Sensitivity

Clinically defined populations (confirmed positive with disease specific reference methodologies) have been used for checking the sensitivity. Specificity was checked with control groups that embrace a normal healthy population as well as clinically defined control groups.

#### Sensitivity:

Intrinsic Factor, H<sup>+</sup>K<sup>+</sup>-ATPase >99%

#### Specificity:

Intrinsic Factor, H<sup>+</sup>K<sup>+</sup>-ATPase >99%

### Reproducibility

The dot assay is a qualitative test and the precision is evaluated in terms of variation of the visual colour of the test. Three control sera (high, medium, low positive) were assayed for intraassay and interassay imprecision in a statistically relevant repetition.

#### REMARKS:

## INCUBATION SCHEME

# BiermAK Dot (4020)

1.	Bring all reagents and the requested number of strips to room temperature (18-25°C)
2.	Place the strips with the reactive side upside in the tray and dispense 2 ml of wash solution (made of B) into the respective wells
3.	Seal plate and incubate while shaking 10 minutes, room temperature (18-25°C)
4.	Discard wash solution
5.	Pipette 1.5 ml sample diluent (C) and 10 µl patient serum or plasma (1 + 150) into each well
6.	Incubate while shaking 30 minutes, room temperature (18-25°C)
7.	Decant, wash strips while shaking 3 x 3 minutes with 1.5 ml (made of B)
8.	Pipette 1.5 ml conjugate (D) in the respective well
9.	Incubate while shaking 30 minutes, room temperature (18-25°C)
10.	Decant, wash strips while shaking 3 x 3 minutes with 1.5 ml (made of B)
11.	Pipette 1.5 ml substrate (E)
12.	Incubate while shaking 10 - 12 minutes, room temperature (18-25°C)
13.	Decant, wash strips to stop reaction while shaking 1 x 3 minutes with 1.5 ml (made of B)
14.	Dry membranes by pressing the strip onto absorbent paper. After approximately 30 min the strips are ready to be interpreted.

## SAFETY PRECAUTIONS

- **This kit is for in vitro use only.** Follow the working instructions carefully. GA GENERIC ASSAYS GmbH and its authorized distributors shall not be liable for damages indirectly or consequentially brought about by changing or modifying the procedure indicated. The kit should be performed by trained technical staff only.
- The expiration dates stated on the respective labels are to be observed. The same relates to the stability stated for re-constituted reagents.
- Do not use or mix reagents from different lots.
- Do not use reagents from other manufacturers.
- Avoid time shift during pipetting of reagents.
- All reagents should be kept at 2 - 8 °C prior use in the original shipping container.
- Some of the reagents contain small amounts of bromonitrodioxane (< 0.01 % w/w), methylisothiazolones (< 20 ppm) or sodium azide (< 0.05 %) as a preservative. They must not be swallowed or allowed to come into contact with skin or mucosa.
- Since the kit contains potentially hazardous materials the following precautions should be observed:
  - Do not smoke, eat or drink while handling kit material,
  - Always use protective gloves,
  - Never pipette material by mouth,
  - Wipe up spills promptly, washing the affected surface thoroughly with a decontaminant.
- In any case GLP should be applied with all general and individual regulations to the use of this kit.