

## **GAD DOT KIT**

GADI - GADII

Code: AD GAD

24 Tests - For in vitro use only

### **1. INTENDED USE**

Alphadia GAD DOT kit is an Immunodot kit intended for the detection of IgG autoantibodies against the Glutamate Decarboxylase isoforms GAD I (GAD 67) and GAD II (GAD 65) in human serum.

### **2. INTRODUCTION**

Stiff-man Syndrome (SMS) is a neurological disorder characterised by a clinical picture of slowly progressing rigidity (stiffness) in the axial muscles, which leads to impairment of ambulation, and painful episodic spasms. About 30 % of affected patients are diabetic and nearly 40 % are reported to have some form of organ-specific autoimmune disorder.

Serologically the diagnosis of SMS is based on the detection of autoantibodies which react against both of the two isoforms of Glutamate Decarboxylase (GAD I or GAD 67 kD and GAD II or GAD 65 kD), an enzyme involved in the metabolism of GABA, the major inhibitory neurotransmitter of both the central and the peripheral neuronal systems. Anti-GAD antibodies have also been detected in patients with neurological disorders other than SMS (degenerative cerebellar ataxia, epilepsy, palatal myoclonus), which suggests a link of GAD autoimmunity not only with SMS but also with cerebellar dysfunction.

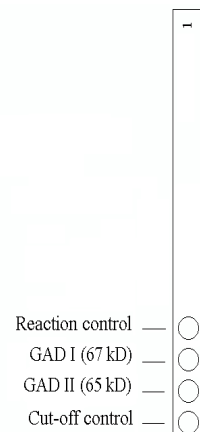
Whereas the highest concentrations of GAD I and GAD II are found in the brain, and sera from SMS patients contain high levels of autoantibodies against the two isoforms, it is interesting to note that only GAD II is expressed in significant amounts in the pancreatic Langerhans islets and autoantibodies against GAD II can also be found in patients with Insulin-Dependent Diabetes Mellitus (IDDM). Although GAD autoantibodies are found in SMS and IDDM, they are markedly different in the two diseases regarding their titer and epitope specificity : in SMS the antibodies are extremely high-titered and they recognise a combination of linear and conformational epitopes on both GAD I and GAD II, while in IDDM autoantibodies are directed essentially against restricted conformational epitopes of only GAD II.

The GAD I/GAD II Dot kit, allowing the simultaneous detection and identification of GAD I and GAD II autoantibodies, is a useful tool for the diagnosis of the Stiff-man Syndrome and neurological disorders associated with cerebellar dysfunction.

**Alphadia GAD DOT kit combines easy handling and cost effectiveness for the reliable detection of autoantibodies to GAD I/II and the differential diagnosis of Stiff-man Syndrome or neurological disorders associated with cerebellar dysfunction.**

### **3. PRINCIPLE OF THE TEST**

The test is based on the principle of an Enzyme Immunoassay. The test strip is composed of a membrane fixed on plastic support. During test procedure, the strips are incubated with diluted patients sera. Human antibodies, if present, bind to the corresponding specific antigen(s) on the membrane. Unbound or excess antibodies are removed by washing and AP-conjugated goat antibodies against human IgG are added to the strips. This enzyme conjugate binds to the antigen-antibody complexes. After a second washing step to remove excess conjugate, substrate solution is added. Enzyme activity, if present, leads to the development of purple dots on the membrane pads. The intensity of the coloration is directly proportional to the amount of antibody present in the sample.



#### 4. KIT CONTENTS

##### Abbreviations :

TBS = Tris Buffer Saline ; BSA = Bovine Serum Albumin ; MIT = MethylIsoThiazolone ;  
AP = Alkaline Phosphatase ; NBT = NitroBlue Tetrazolium ; BCIP = Bromo-Chloro-Indolyl-Phosphate.

##### TO BE DILUTED :

**(10 X) Wash buffer :**        **1 x 50 ml** (colourless)  
*Contains : TBS, Tween ; Preservative : MIT*

##### READY TO USE :

**Dot strips :**                    **24 units**  
*(4 Dots each: 1 reaction control, 2 antigens, 1 cut-off control)*

**Diluent buffer :**                **1 x 40 ml** (yellow)  
*Contains : TBS, BSA, Tween ; Preservative : MIT*

**Conjugate :**                    **1 x 40 ml** (red)  
*Contains : AP-conjugated goat anti-human IgG ; Preservative : MIT*

**Substrate :**                    **1 x 40 ml** (brown bottle, pale yellow solution)  
*Contains : NBT/BCIP ; Preservative : 0.05 % NaN<sub>3</sub> (sodium azide)*

**Incubation trays:**            **3 units**  
*(with 8 wells for incubation)*

#### 5. MATERIAL REQUIRED BUT NOT PROVIDED

Rocking or shaking platform / Micropipettes / Timer / Graduated cylinder / Distilled or deionised water / Tweezers / Absorbent and/or filter paper

#### 6. STORAGE

The reconstituted Wash Solution is stable for at least one month at 2-8°C. Reagents and strips can be stored at 2-8°C until the expiry date indicated on each vial or tube. Place unused strips back into the provided tube, seal it and store at 2-8°C. Chromogen/Substrate (NBT/BCIP) shall be stored at 2-8°C.

#### 7. PRECAUTIONS

All reagents are for in vitro diagnostic use only. The kit contains potentially hazardous components thus avoid contact with skin, eyes or mucosae. Patient samples shall be handled as potentially infectious. Do not substitute reagents or mix strips with different batch numbers this may lead to variations in the results. Avoid touching strips with fingers. Use tweezers or wear laboratory gloves. Allow reagents and strips to equilibrate at room temperature before use. Strictly observe incubation times. Handle Chromogen Substrate (NBT/BCIP) with care in order to avoid any contamination with Alkaline Phosphatase.

#### 8. SAMPLE COLLECTION, HANDLING AND STORAGE

Samples should be preferentially fresh-collected ones. Sera with debris should be low speed centrifuged. Blood samples should be collected in dry tubes or in tubes containing EDTA or heparin. After separation serum samples shall be used immediately or aliquoted and stored at 2-8°C for some days or frozen at -20°C for longer periods. Avoid repeated freezing thawing cycles.

## 9. ASSAY PROCEDURE

### BASIC HANDLING AND TIPS :

The dots are precoloured blue on the strips, ensuring that all antigens have been dotted correctly onto the membrane. This blue coloration disappears during the first step of the procedure. During incubation with the sample a faint pink background coloration appears on the membrane and disappears upon drying at the end of the procedure.

During the procedure, agitation of the incubation tray is necessary to ensure efficient circulation of fluids over the membrane. Any kind of shaking or rocking platform may be used if the amplitude of the movement does not cause spilling out of solutions and cross-contamination between the wells. Agitation speeds ranging from 10 to 60 rpm are suitable, with 20–30 rpm being preferred.

After each filling of the wells with solution, agitate manually the incubation tray to ensure that the strips are completely immersed and to remove air bubbles which may be trapped under the strip. Alternatively, floating strips may be forced into the solution by pushing down (with tweezers or pipette tip) on the upper part of the strip (plastic label zone).

Avoid touching the membrane zone of the strip with fingers, tweezers or pipette tips. Always use the plastic label zone for handling or manipulation. The whole procedure has to be run at room temperature

### 9.1 Reagents preparation

1. Allow all components to equilibrate at room temperature before use.
2. Dilute the concentrated Wash Buffer 10x with distilled water.

*Prepare 15 ml diluted Wash buffer per strip tested*

*Example: 1,5 ml concentrated wash buffer + 13,5 ml distilled water for one strip.*

### 9.2 TECHNIQUE

1. Place one strip per patient into the wells, blue dots facing up.
2. Add 2 ml Wash Buffer to each well. Incubate (shake) for 10 min.  
*Upon correct incubation the blue coloration of the dots completely disappears.  
If not prolong the procedure until the colour of the dots fades completely.*
3. Discard solution from the wells.  
*Remove liquid by slowly inverting the plate. The strips will adhere to the bottom of the wells. Dry the edges of the tray with absorbent paper.*
4. Add 1,5 ml Sample Diluent to the wells.
5. Add 10 µl patient sample to the wells. Incubate (shake) for 30 min.  
*Avoid touching the membrane with the pipette tip. Preferentially dispense the sample in the solution over the upper part of the strip (plastic label zone).*  
**Note:** *Steps 4 and 5 can be combined by pre-diluting the sample in a glass or plastic tube (1,5 ml diluent + 10 µl patient sample → Mix → Add to the well)*
6. Wash 3 x 3 minutes with 1,5 ml Wash Buffer (shake).  
*Remove liquid from the wells by slowly inverting the plate. The strips will adhere to the bottom of the wells. Dry the edges of the tray with absorbent paper.*
7. Add 1,5 ml Conjugate to each well. Incubate (shake) for 30 min.
8. Wash 3 x 3 min. with 1,5 ml Wash Buffer (see 6.)
9. Add 1,5 ml Substrate to the wells. Incubate (shake) for 10 min.
10. Wash 1 x 3 min. with 1,5 ml Wash solution to stop the reaction.
11. Collect the strips from the wells and allow them to dry on absorbent paper.

## 10. RESULTS INTERPRETATION

### 10.1 Interpretation

1. Peel off the cover of the adhesive on the back side of each strip and attach strips dots face up onto the marked fields of the interpretation sheet provided with the kit. This will indicate the respective positions of the different controls and antigens on the membrane.
2. Check the first upper Dot (reaction control): it must be positive for all patients.  
*Only a clearly coloured positive Reaction Control Dot ensures your results are valid and operation was correct and/or kit components were not degraded.*
3. Compare the specific antigen Dots to the cut-off Dot which always is the last in order.  
*The colour intensity of the Antigen Dots is directly proportional to the titer of the specific antibody in the patients sample.*  
***Under optimum conditions and if the sample is free of interfering substances the cut-off dot may be even close to uncoloured. In contrast a highly coloured cut-off Dot indicates a high rate of unspecific binding in the sample.***

**POSITIVE RESULT:** A sample is positive for a specific antibody if the colour intensity of the corresponding Antigen Dot is higher than the intensity of the cut-off Dot.

**NEGATIVE RESULT:** A sample is negative for a specific antibody if the colour intensity of corresponding Antigen Dot is lower or equal than the intensity of the cut-off Dot.

## 11. TEST LIMITATIONS

ALPHADIA GADI/II DOT kit is intended for the detection of autoantibodies to Glutamate Decarboxylase isoforms GAD I (GAD 67) and GAD II (GAD 65). It serves as an aid for the differential diagnosis of Stiff-man Syndrome or other neurological disorders. However results shall be interpreted in the light of a complete clinical examination and case history.

## 12. BIBLIOGRAPHY

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