### D-DIMER

**Turbidimetric Immunoassay**

Reagent for quantitative determination of D-Dimer in the human plasma

| REF 13210 | R1 3 x 7 mL | R2 3 x 4 mL | R3 2 x 1 mL | R4 2 x 7 mL |

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#### TECHNICAL SUPPORT AND ORDERS

Tel : (33) 03 23 25 15 50  
Fax : (33) 03 23 256 256

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#### CLINICAL SIGNIFICANCE (1-4)

Fibrin fragments containing D-Dimer antigen is always present in plasma as a result of plasmin degradation. After an injury or in case of conditions associated with increased haemostatic activity, the D-Dimer concentration increases in plasma. The determination of D-Dimer concentration is an aid in the diagnosis of thrombosis. Deep vein thrombosis (DVT), pulmonary embolism (PE) and disseminated intravascular coagulation (DIC) are associated with elevated level of D-Dimer. A negative D-Dimer test result has a high negative predictive value for patient with a suspected thrombotic disorder.

#### PRINCIPLE

D-DIMER reagent consists in sub-micron sized polystyrene particles coupled to monoclonal antibodies specific for D-Dimer. When plasma specimen containing D-Dimer is exposed to the reagent, the particles will agglutinate, giving rise to increased light-scattering. This phenomenon leads to an increase of absorbance measured at 600-800 nm which is proportional to the concentration of D-Dimer in the specimen.

#### REAGENTS

- **Vial R1**  
  **REACTION BUFFER**
  Buffer  
  Preservatives
- **Vial R2**  
  **LATEX REAGENT**
  Polystyrene particles coated with monoclonal antibodies  
  Buffer  
  Preservatives and stabilizers
- **Vial R3**  
  **D-DIMER STANDARD**
  Lyophilised human plasma enriched with D-Dimer  
  The concentration of this standard is batch-specific (see **Assigned value on the label of the vial**)
- **Vial R4**  
  **DILUTION BUFFER**
  To be used for diluting D-DIMER Standard when constructing the standard curve (May also be used to dilute plasma of patients). This Standard is traceable to an In-House Reference Preparation which underwent a one-time value assignment to align with another commercially available assay which report results in ng/mL D-Dimer

#### REAGENTS PREPARATION

- Vial R1, R2 and R4: Ready to use
- Vial R3 (Standard): Add 1 mL of demineralised water. Re-close the vial and let stand for 15 min at room temperature. Then mix gently by swirling before use to homogenise the contents.

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#### SAFETY CAUTIONS

BIOLABO reagents are designated for professional, in vitro diagnostic use.  
- Use adequate protections (overall, gloves, glasses).  
- Do not pipette by mouth.  
- In case of contact with skin or eyes, thoroughly wash affected areas with plenty of water and seek medical advice.  
- Reagents contain sodium azide (concentration < 0.1 %) which may react with copper and lead plumbing. Flush with plenty of water when disposing.  
- Material Safety Data Sheet is available upon request.  
- Waste disposal: Respect legislation in force in the country.  
All specimens, standards and controls should be handled as potentially infectious, in accordance with good laboratory practices using appropriate precautions. Respect legislation in force in the country.

#### STABILITY AND STORAGE

Store at 2-8°C, well cap in the original vial and away from light.  
- Unopened reagents are stable until expiry date stated on the label when used and stored as request.  
- Once opened, when free from contamination, reagents R1, R2, R4 are stable for 2 weeks at 8-25°C and 4 weeks at 2-8°C.  
- Flacon R3: transfer the necessary quantity, well recapped and stored in the original vial. Once reconstituted and without contamination, standard (vial R3) is stable for 12 Hours at 2-25°C.

#### SPECIMEN COLLECTION AND HANDLING (5)

**Plasma (citrate).**  
Mix freshly drawn blood (9 Volumes) with buffered tri-sodium citrate solution 0.109M (1 volume). Centrifuge for 10 min. at 3000g and extract supernatant.

#### INTERFERENCES (8)

Limitations: This test should be used with other clinical and diagnostic information in order to diagnose and manage patients.

<table>
<thead>
<tr>
<th>Interferent</th>
<th>No interference up to</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haemoglobin</td>
<td>10 g/L</td>
</tr>
<tr>
<td>Triglycerides</td>
<td>20 g/L</td>
</tr>
<tr>
<td>Bilirubin</td>
<td>0.5 g/L</td>
</tr>
<tr>
<td>Low molecular weight Heparin</td>
<td>100 U/mL</td>
</tr>
<tr>
<td>Non-fractioned Heparin</td>
<td>100 U/mL</td>
</tr>
</tbody>
</table>

Patients who have received mouse monoclonal antibodies for diagnosis or therapy may have plasmas containing anti-mouse antibodies (HAMA). Such antibodies may lead to false enhance D-Dimer concentration. The same may occur in presence of Rheumatoid Factor.

For a more comprehensive review of factors affecting this assay refer to the publication of Young D.S.

#### MATERIAL REQUIRED BUT NOT PROVIDED

1. Instrument/analyzer useful with turbidimetric detection in the 600 - 800 nm wavelength range or Coagulometer at 405 nm (see specific application) .  
2. **REF 13211** D-DIMER Control 1 and **REF 13212** D-DIMER Control 2
CALIBRATION

- D-DIMER Standard (vial R3) enclosed in the kit
- D-DIMER Control 1 REF 13211
- D-DIMER Control 2 REF 13212
- Assayed control sera referring to the same method.
- External quality control program.

It is recommended to calibrate in the following cases:
1. When using a new batch of reagent.
2. After maintenance operations on the instrument.
3. When control values are out of range, even after using a new vial of fresh serum.

QUALITY CONTROL

- D-DIMER Control 2 REF 13212
- Assayed control sera referring to the same method.

It is recommended to control in the following cases:
- At least once a run.
- At least once within 24 hours.
- When changing vial of reagent.
- After maintenance operations on the instrument.

If control is out of range, apply following actions:
1. Repeat the test with the same control.
2. If control is still out of range, prepare a fresh control serum and repeat the test.
3. If control is still out of range, use a new vial of calibrator or a fresh calibrator and repeat the test.
4. If control is still out of range, calibrate with a new vial of reagent.
5. If control is still out of range, please contact BIOLABO technical support or your local Agent.

EXPECTED VALUES (4) (7)

<table>
<thead>
<tr>
<th>Plasma</th>
<th>&lt; 200 ng/mL (DDU)</th>
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</thead>
</table>

D-Dimer concentrations increase during pregnancy and with age. Caution, as there is no established international standard value, this one may differ when using D-Dimer reagent from different manufacturer. Each laboratory should establish its own normal ranges for the population that it serves.

PERFORMANCES CHARACTERISTICS

The performance studies for D-Dimer reagents were realised on a Sysmex CA-1500 analyzer:

Precision: (Reproducibility and Repeatability)

<table>
<thead>
<tr>
<th>Within Run</th>
<th>Mean (ng/mL)</th>
<th>S.D.:</th>
<th>C.V. %:</th>
<th>Criteria</th>
<th>Middle level</th>
<th>High level</th>
</tr>
</thead>
<tbody>
<tr>
<td>N=7,k=6</td>
<td>308</td>
<td>90</td>
<td>3.1</td>
<td>&lt; 4 %</td>
<td>1541</td>
<td>23.9</td>
</tr>
<tr>
<td>Run to run</td>
<td>Mean (ng/mL)</td>
<td>308</td>
<td>5.5</td>
<td>1.8</td>
<td>1541</td>
<td>16.8</td>
</tr>
<tr>
<td>N=7,k=6</td>
<td>S.D.:</td>
<td>1.1</td>
<td></td>
<td>1.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>C.V. %:</td>
<td></td>
<td></td>
<td>&lt; 4 %</td>
<td>&lt; 3 %</td>
<td></td>
</tr>
</tbody>
</table>

Detection limit: approx. 50 ng/mL

Prozone effect: tested up to 100 000 ng/mL, no effect found within the measuring range (approx. up to 3500 ng/mL)

Comparison with a commercially available reagent (same method): using 66 specimens between 50 and 3500 ng/mL

\[ y = 1 x - 9.6 \quad r = 0.99 \]

LINEARITY

The assay is linear between 50 and 3500 ng/mL (DDU). Above 3500 ng/mL (DDU), dilute the specimen with diluent (vial R4) and re-assay taking into account the dilution factor to calculate the result. Linearity limit depends on specimen/reagent ratio.

PROCEDURE

Application procedures on clinical chemistry analyzers are available upon request.

CALCULATION (6)

Calculate the result in D-Dimer units (DDU) as follows:

- Calculate \( \Delta \text{Abs} \) (Abs A2 – Abs A1) for standards, controls and assays.
- Plot a Standard Curve “Concentration = f (\( \Delta \text{Abs} \))”.

Read the concentration of controls and samples on the graph.

To convert results in Fibrinogen equivalent units (FEU), multiply the result (DDU) by 1.74

REFERENCES

5. CLSI Approved Guideline H21-A5