FIBRINOGEN, FIBRINOGEN HETEROGENEITY AND FIBRINOLYTIC ACTIVITY IN DIABETES MELLITUS. 
V. Gogolich, I. Iniski, M. Pulini, E. Gorden, B. Lipinski, 
St. Elizabeth's Hospital, Tufts University School of Medicine, Boston, Massachusetts, U.S.A.
Fibrinogen (F) concentration, fibrinogen heterogeneity on 3.5% polyacrylamide gels, 
and fibrinolytic activity (FA) measured by plasminogen activation in diabetic plates and fibrin 
plaque (FPP) were measured in 66 patients with well documented diabetes mellitus (DM) and in 50 healthy subjects of comparable age. A high molecular weight and 
lower molecular weight (LMW and LWM) fibrinogen fractions were identified. The mean 
values and statistical evaluation of their differences were as follows:

<table>
<thead>
<tr>
<th></th>
<th>CONTROLS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>570 µg/mL</td>
<td></td>
</tr>
<tr>
<td>LMW</td>
<td>&lt;0.01</td>
<td>145 mg/dL</td>
</tr>
<tr>
<td>LMW</td>
<td>&lt;0.001</td>
<td>32 mg/dL</td>
</tr>
<tr>
<td>FPP</td>
<td>&lt;0.01</td>
<td>32 µg/mL</td>
</tr>
<tr>
<td>FA</td>
<td>&lt;0.001</td>
<td>25 mg/dL</td>
</tr>
</tbody>
</table>

The clinical duration of DM, degree of control or type of medication did not appear to 
influence these findings. However, within the patient group, those with clinical evidence of 
microvascular disease had significantly (p<0.02) higher LMW fibrinogen and lower FPP 
(p<0.01) than the remainder. These findings suggest that DM is associated with fibrin 
deposition, and accelerated F degradation to LMW and LWM fractions and that these processes 
may be associated with the development of vascular lesions.

CONGENITAL DYSFIBRINOGENEMIA. (FIBRINOGEN OSLO II). N.C. Godal, F. Brostand 
and D. Sierulf. Haematological Research Laboratory, Department IX, Ullevål 
Hospital University Clinic, Oslo, Norway.
An autosomal inherited, qualitative fibrinogen defect, associated with 
prolonged thrombin clotting time, low plasma fibrinogen when assayed by a fibrin 
plasminogen polymerization test and large amounts of fibrinogen antigen determinants 
in the supernatant after clotting, is presented. The plasma fibrinogen level 
was normal when assayed by an immunological technique or by quantitation of 
insoluble fibrin under conditions in which fibrin polymerization is enhanced.
As judged from N-terminal amino acid analyses, fibrinopeptides were split off 
at normal speed, and the subunit chains of the fibrinogen appeared normal when 
examined on polyacrylamide gels. The abnormality was not associated with 
bleeding tendency, and other routine coagulation tests gave normal results.

INTERACTIONS OF HUMAN FIBRINOGEN IN SOLUTION. H. Gervallach, H. Känig. Dept. of Physics, ETH 
Zürich, V. Hofmann, P.W. Graub. Dept. of Medicine, University of Berne, M. Zulauf. Biocentre, 
Basel, Switzerland.

The intriguing diversity of published translational diffusion constants for the fibrinogen 
molecule can hardly be explained, unless interactions between the molecules are postulated. In the 
present study we have investigated the possible effect of molecular association and electrostatic 
terms of molecular interactions on the Brownian motion. The translational diffusion coefficient 
(Dt), rotational diffusion coefficient around the minor axis (Dr) and the sedimentation coefficient 
have been measured. The methods used were dynamic light scattering and analytical 
ultracentrifugation. The samples were solutions of purified human fibrinogen. The correlation 
function corresponding to Dt deviates from a single exponential. The initial slope is found to 
depend on concentration, being Dp = (1.7 ± 0.1) 10^{-7} cm^2/s at 100 mg/mL, pH 7.4 and 0.15 molar 
Tris-Cl, and increases at fibrinogen concentrations below 2 mg/mL. These results are compatible 
with a polydispersity solution, in which single molecules are in equilibrium with pair and higher 
aggregates. The nature of the aggregates is end-to-end as indicated from the difference between 
the two rotational diffusion constants Dp = 40000 ± 200 and Dr = 10000 ± 300 s^{-1}. On the basis of 
the Wall-Glyster model and assumption of end-to-end association we calculated the ratio of 
the sedimentation coefficient of single, pair and triplet associates, being 1:1:1:1:20. Therefore, 
it is difficult to separate them in a sedimentation run. For ionic strength below 0.05 
molar and low fibrinogen concentration (0.1mg/mL) a fast decay appears in the correlation, 
indicating that the Brownian motion is strongly influenced by electrostatic interactions.