

Neutrophil extracellular traps (NETs) on hydrophobic surfaces can cause coagulation

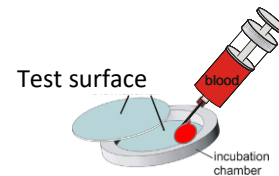
M. Fischer*, C. Sperling, M.F. Maitz, C. Werner
*fischer-marion@ipfdd.de

Background

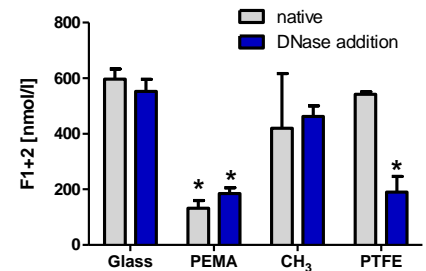
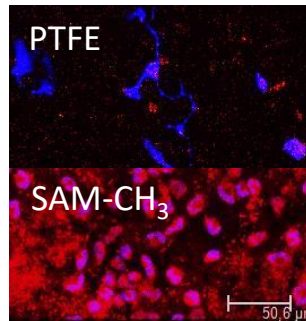
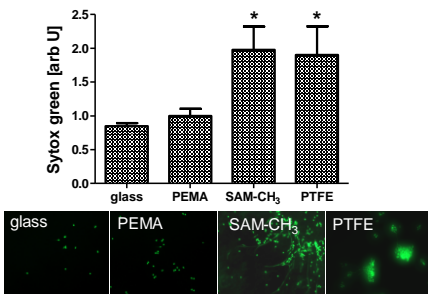
- Expulsion of decondensed DNA has been discovered only recently as a defense mechanism of granulocytes
- A link to thrombosis has been observed clinically
- NET formation in the field of biomaterials research has not been analyzed yet

Method

- Exposure of surfaces with different **hydrophilicity** and **surface charge** to isolated granulocytes and whole blood.
- Stain and quantification of characteristic NET components (DNA, cit.Histones, elastase)
- Analysis of platelet adhesion and coagulation



Observations



- Hydrophobic surfaces induce spontaneous NET formation (green)
- Blood platelets (red) co-localize with NETs (blue)
- NETs on biomaterials are pro-coagulant
- NET digestion by DNase may cause pro-coagulant products (-CH₃ surface)

Suggested mechanism

- Spontaneous NET formation on hydrophobic materials
- FXIIa/Kallikrein activation at the NET surface
- Propagation of the coagulation cascade by adherent platelets
- NET degradation products show material-dependent coagulant properties

