**Development of microfluidic system for tracking immune complex initiated inflammation**

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Our aim is the development of an autonomous microfluidic device applicable for monitoring the activation of neutrophil granulocytes playing central role in inflammation.

Capillary system was established by the adaptation of the microscale architecture of the organic water conducting tissues, which ensures autonomous sample transport due to the geometry and the PDMS material modified by surfactant molecules. Lab-on-a-Chip system was developed by integration of the microfluidic structures to be applied for cell-analytic application.

In order to validate the bioanalytical device a reporter cell line was established by genetic modification that is capable to produce green fluorescent protein as indicator of immune complex induced cell activation. Applicability of the developed system was demonstrated by recognition of rheumatoid arthritis diseased and healthy control patient’s samples based on the monitoring the number of dihydrorhodamine treated human neutrophil granulocytes bounded to the printed disease-specific peptides after serum treatment.