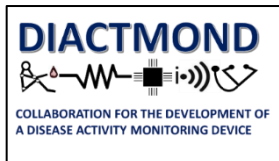


DIACTMOND NEWSLETTER 1

SEPTEMBER 2020



Dear DIACTMOND Colleagues and Friends,

The project is already on the 9th month and various activities are on the way.

- **The development of the system algorithms – the 1st Milestone of the project ...**

has been reached. Milestone 1 (part of WP3) regards the establishment of the indices for inflammation and coagulation. In brief, algorithms have been developed for the derivation of the relevant indices using image processing techniques on blood samples. The indices are described in one publication (Physics of Fluids, 2020) and two other reports are prepared for submission in relevant journals. In these reports image processing algorithms and techniques for the assessment of red blood cell aggregation, whole blood coagulation and RBC velocity (for the ESR index) are presented. These reports are the following:

1. Pasiás D., Passos A., G. Constantinides, Balabani S. and Kaliviotis E. (2020). Surface tension driven flow of blood in a rectangular microfluidic channel: effect of erythrocyte aggregation. *Physics of Fluids*, 32, 071903, doi.org/10.1063/5.0008939.
2. Marinos Louka and Efstathios Kaliviotis. Development of an optical method for whole blood coagulation evaluation in a drop of blood. *Sensors*. To be submitted January 2021.
3. Pasiás D., Passos A., G. Constantinides, L. Koytsokeras, Balabani S. and Kaliviotis E. (2020). Effects of erythrocyte aggregation, haematocrit and deformability in the flow characteristics of blood, flowing in a TiO₂ coated microfluidic channel. In preparation for submission.

- **The microfluidic test-chip, ...**

is in the heart of the developing system, and substantial progress has been also achieved in this aspect. The first functional microfluidics cartridge (part of WP4) is described in the report 3, which is prepared for publication by Pasiás et al. The chip consists of glass plates, enclosing a double-sided adhesive tape forming the fluidic channel in which the sample is placed. The glasses are treated appropriately to enhance the flow.

- **The hardware of the system, ...**

is also developing and a first version is completed. The first functional hardware set-up (part of WP4), shown below, has been developed and testing of the various aspects of its performance has started. The hardware collects image data from the microfluidic chip, processes the results in the microprocessor unit and produces the results (measuring indices) as a time sequence.



That is all for now. We will keep you updated with more news soon.

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