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Automated kinetic measurement of red blood cells agglutination in a biochip with embedded reagents demonstrated with ABO blood typing: Toward a generic method for the measurement of analyte in blood using bi-specific antibodies

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Point-of-care testing (POC) has been developed for decades for many different health purposes. However, different blood analysis generally means different measurement process and so different instruments. And the multiplicity of instruments implies higher costs and training for users, issues POC were meant to tackle. We propose a new generic method of blood analysis based on the agglutination of red blood cells mediated by a bi-specific molecule. The biological basis was demonstrated in different studies using a manual procedure with qualitative manual reading. We are using an automated point of care device using microfluidics with embedded reagents, optical instrumentation and image processing. A proof of concept of autonomous and automated measurement of agglutination kinetics was achieved for ABO blood typing. Further work is being pursued on the integration of the imaging hardware, the embedding of the reagents and the modeling of the physical phenomenon at stake. The titration of d-dimer using bi-specific antibodies is currently under investigation.

Biography

Maxime Huet has completed his Engineering at Grenoble INP-Phelma in 2012. He is currently a PhD student at CEA Grenoble, working in close relation with the company Avalun on innovative diagnostic device. He is the co-author of three papers on various topics.

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