

# InstantCount – Inkjet-printed diagnostics

*Simple, low cost blood tests fabricated by inkjet printing*

All student projects at MCBP are part of on-going research. This leads to a choice of relevant topics and close supervision of all students as there is a group interest in the outcome of the project.

## Project description

The “InstantCount” project develops printed microfluidic cell counting chambers for point-of-care blood tests, with the goal to provide diagnostics to resource-poor settings that do not have access to lab testing. The concept of the test is based on the release of cell staining reagents from hydrogels to realize on-chip sample preparation. Based on this principle, we have demonstrated a simple and affordable CD4 count, a test that is used for HIV staging, and are currently developing printing techniques to fabricate these test chambers in an affordable and reproducible way. At the same time, new assays, such as a malaria test and a differential white blood cell count based on the same principle are developed and new materials for the release of reagents on microfluidic chips are tested.

## Our research

We characterize and optimize the hydrogel materials involved in the sample preparation, develop low cost fabrication techniques (inkjet printing), design and build prototype instruments, program software for image analysis and benchmark our results against standard techniques (FACS, hematology analyzer, microscopy).

## Student projects

### On-chip release from hydrogels

Discover the release kinetics of DNA stains and antibody from new hydrogel materials integrated in microfluidic cell counting chambers. Optimize the release kinetics of each reagent to realize ideal on-chip sample-reagent mixing by varying the preparation of the films.

Drop by at CR4429 or contact [Xichen Zhang](#) for more information.

### Complete blood count

Develop a way to perform on-chip red blood cell lysis. Design and build a setup for counting and sizing red blood cells and platelets by using optical techniques. Create a way to measure blood hemoglobin using simple optics. All within severe size and complexity limits.

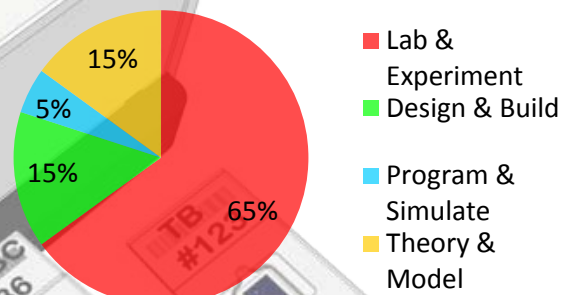
Drop by at CR4431 or contact [Joost van Dalum](#) for more information.

If you are interested in a project related to any other aspect of the InstantCount project – please feel free to contact any of the other members of the InstantCount team:

[Markus Beck](#)

[Dodo Wasserberg](#)

**On-chip release from hydrogels**



**Complete blood count**

