

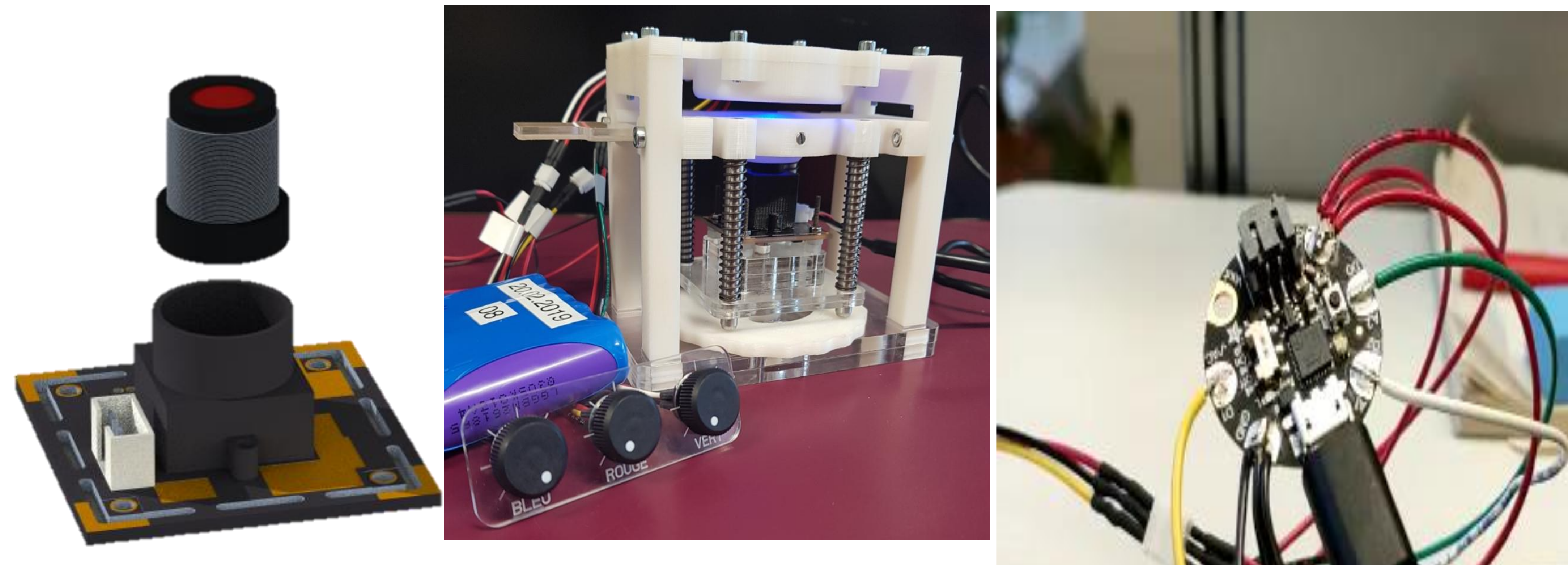
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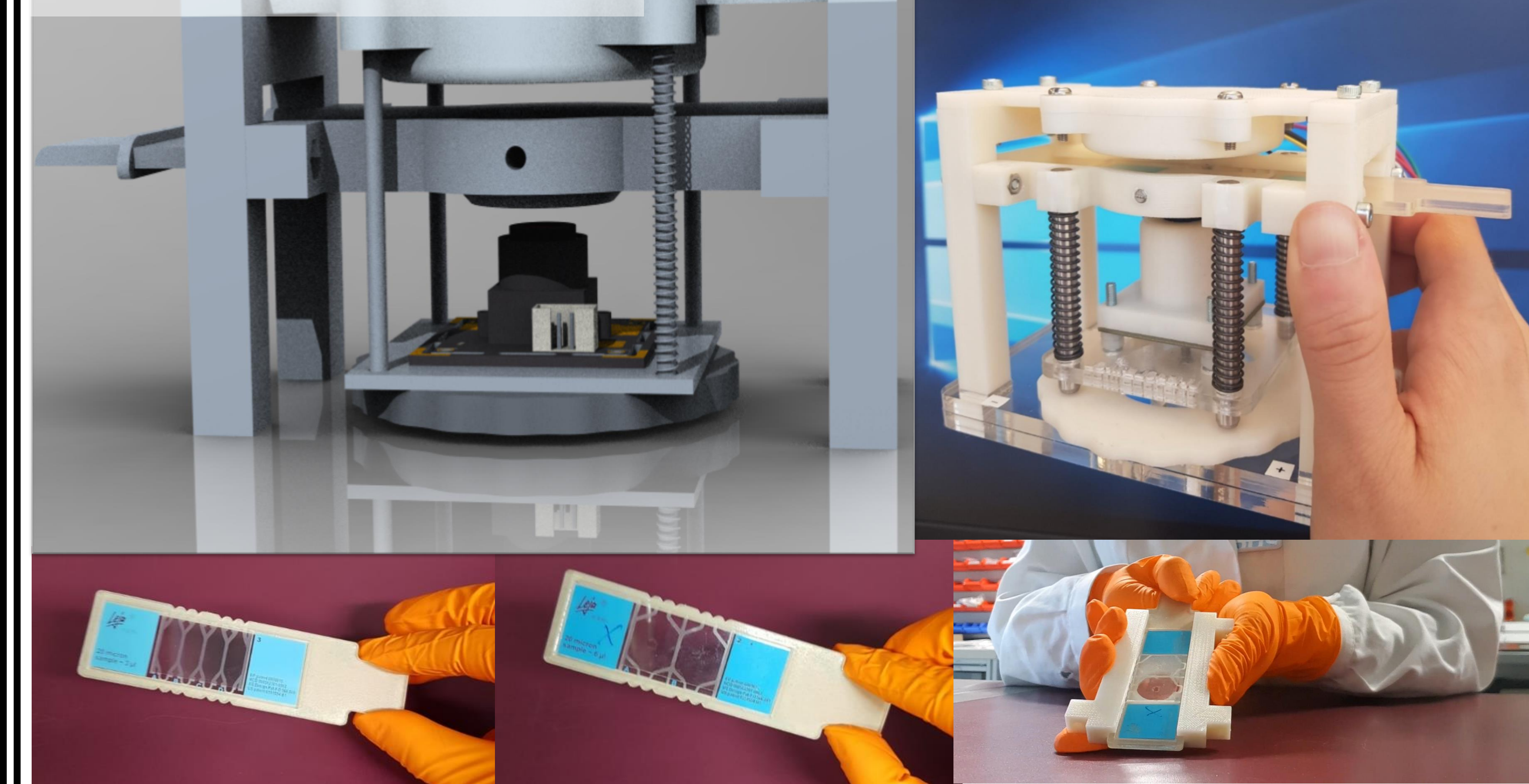
The objective of this project is to design a low-cost portable device to perform essential semen quality measurements, such as concentration and motility of spermatozoa, outside of laboratory conditions. The technology developed must guarantee a standardized, reliable and rapid analysis that meets the medical and veterinary quality standards. To ensure minimum cost and maximum accessibility of the device, we will only include the necessary optical, mechanical and electronic parts. Image pre-processing and analysis will be carried out on a companion mobile application.

## OPTICAL PART



- Microscopy system composed of a monochromatic camera and an inverted lens (12mm 2,8 focal) on a 1 / 2.5" Aptina MI5100 CMOS Sensor.
- Recording of videos with a resolution of 1920x 1080 pixels with 30 frames/sec.
- LED-based lighting control by potentiometer

## MECHANICAL PART



- Compatibility with different microscopy counting chambers slide.
- Simple slide insertion with notched drawer (6 slots)
- Integration of an easy-to-use mechanical system to focus on the cells.

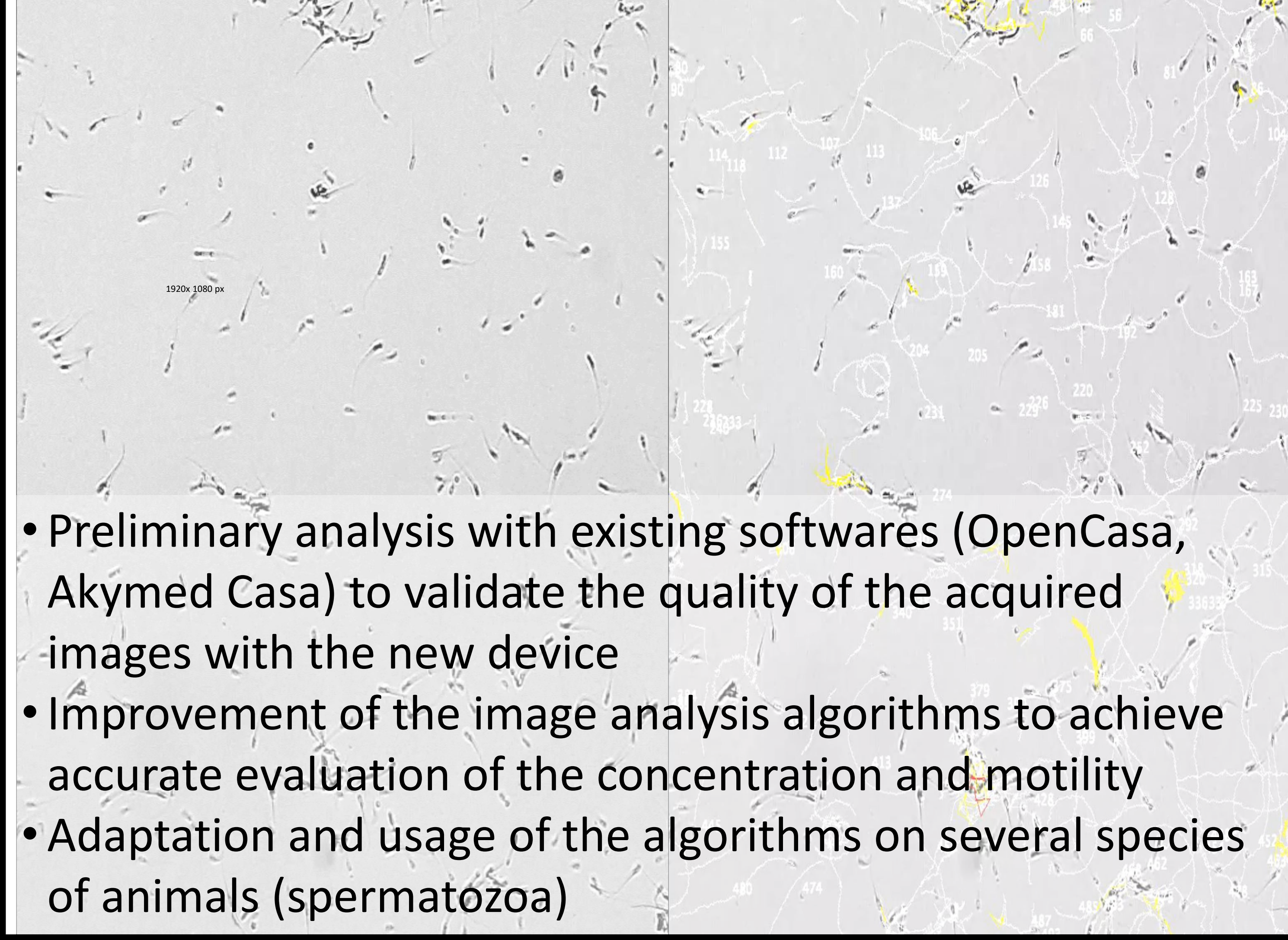
## DESIGN PART

- Point of care
- Powered via USB cable

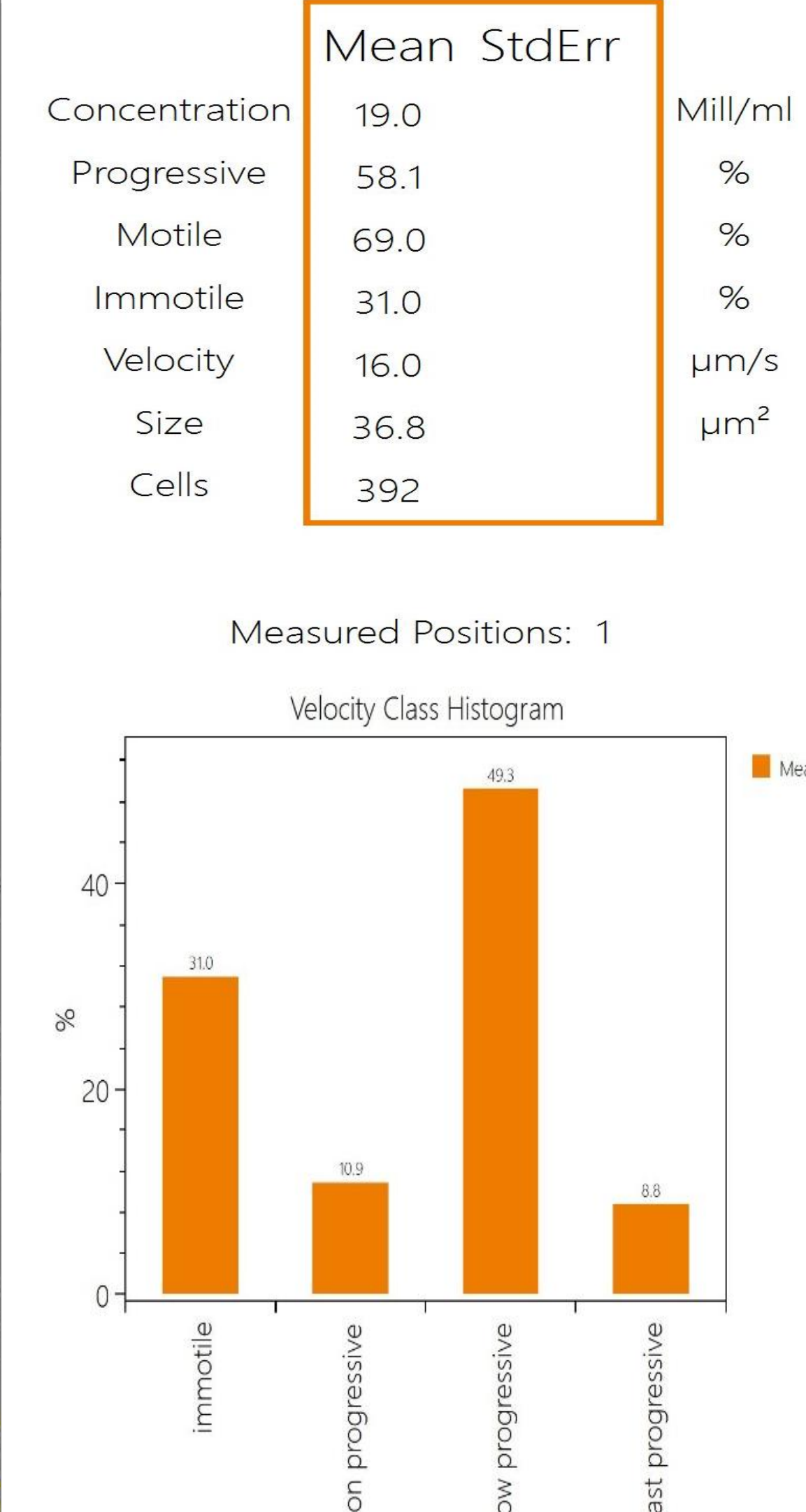


- Simple controls for light and focus.

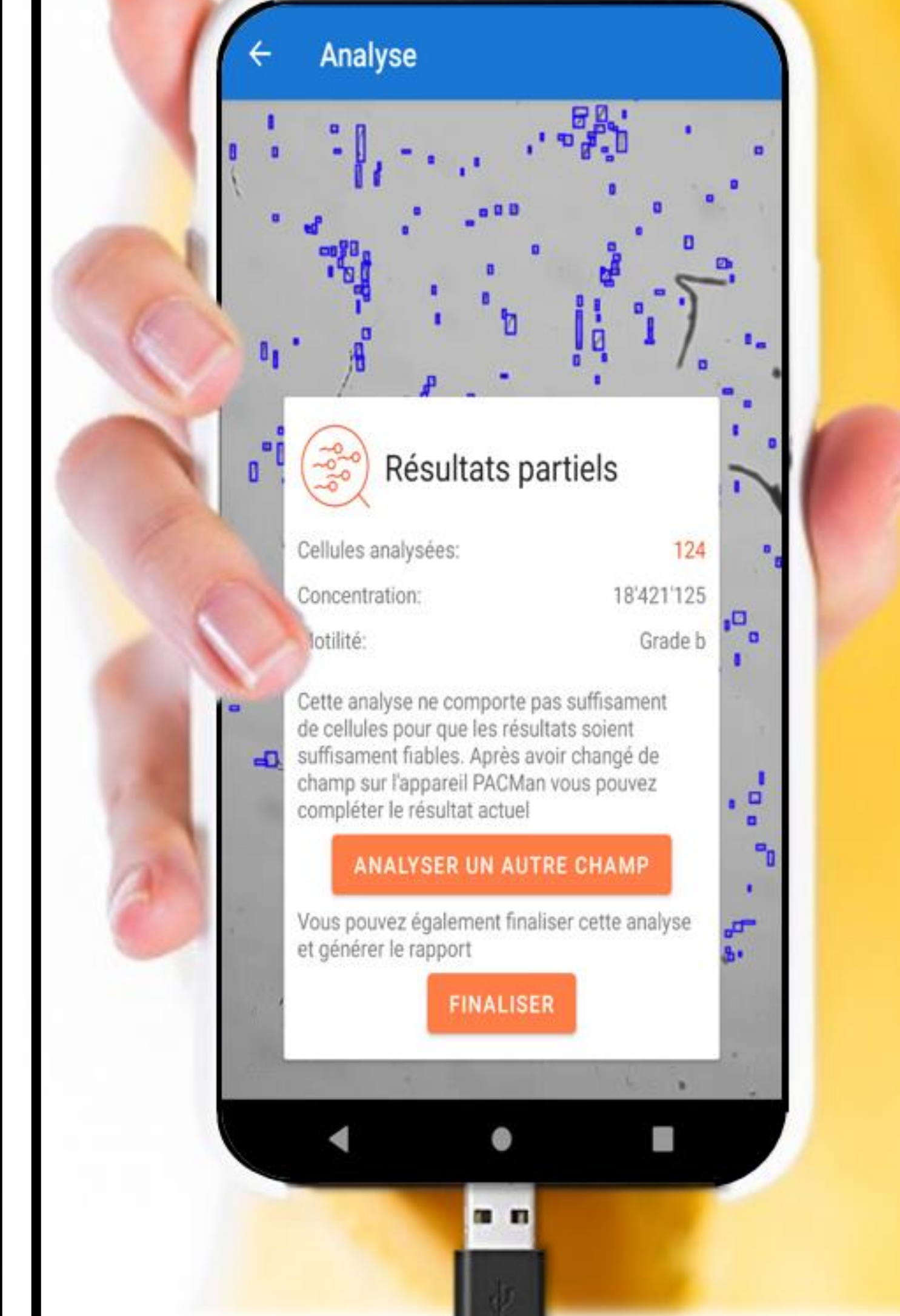
## IMAGE ANALYSIS



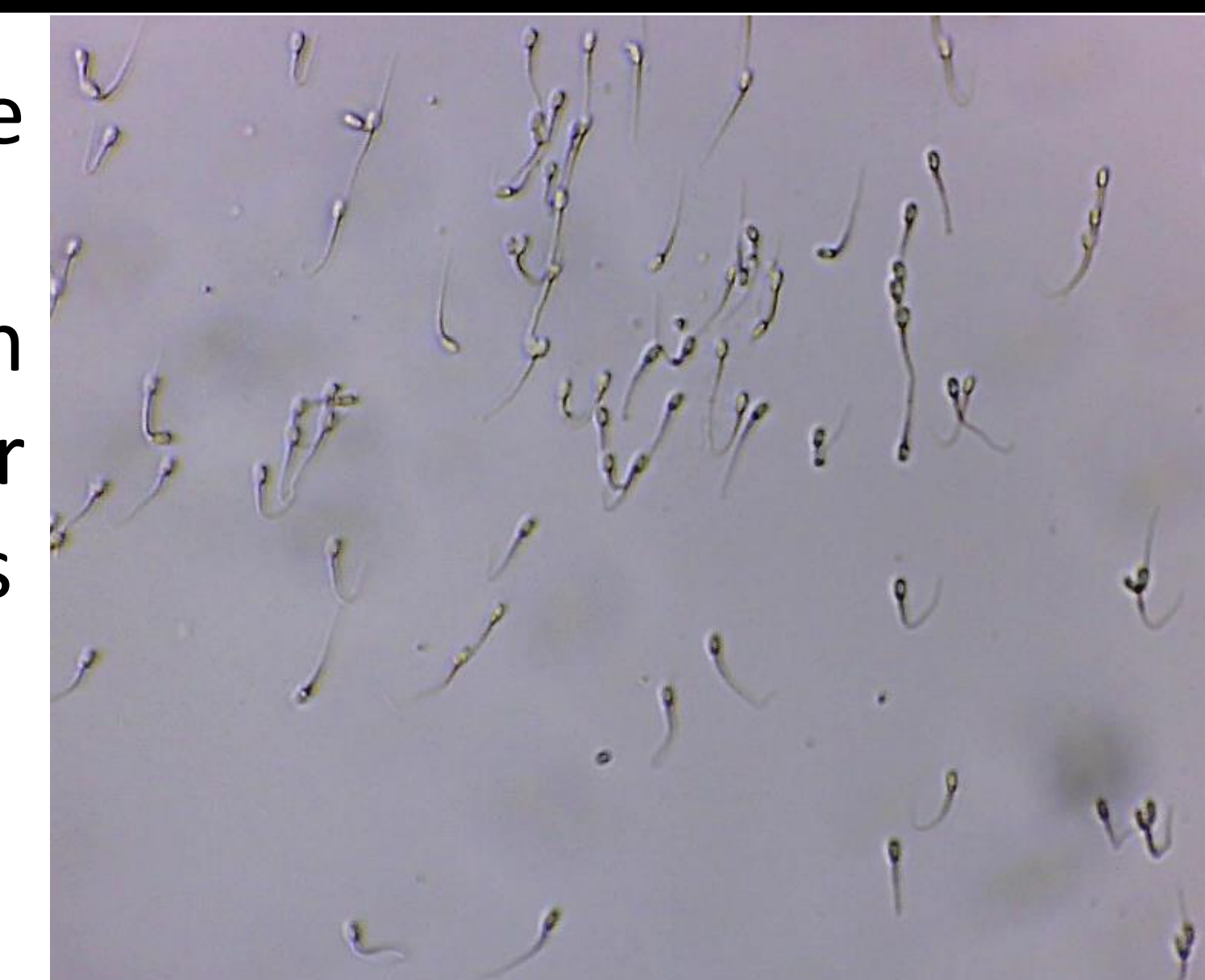
- Preliminary analysis with existing softwares (OpenCasa, Akymed Casa) to validate the quality of the acquired images with the new device
- Improvement of the image analysis algorithms to achieve accurate evaluation of the concentration and motility
- Adaptation and usage of the algorithms on several species of animals (spermatozoa)



## USER INTERFACE



- Easy to use interface (GUI)
- To run on Android and/or Windows devices



## TAKE HOME MESSAGE

The proposed solution differs from similar existing devices on the market by offering to analyze not only the concentration but also the motility of spermatozoa. We plan to use it for veterinary diagnostic purposes, which will introduce another novelty.