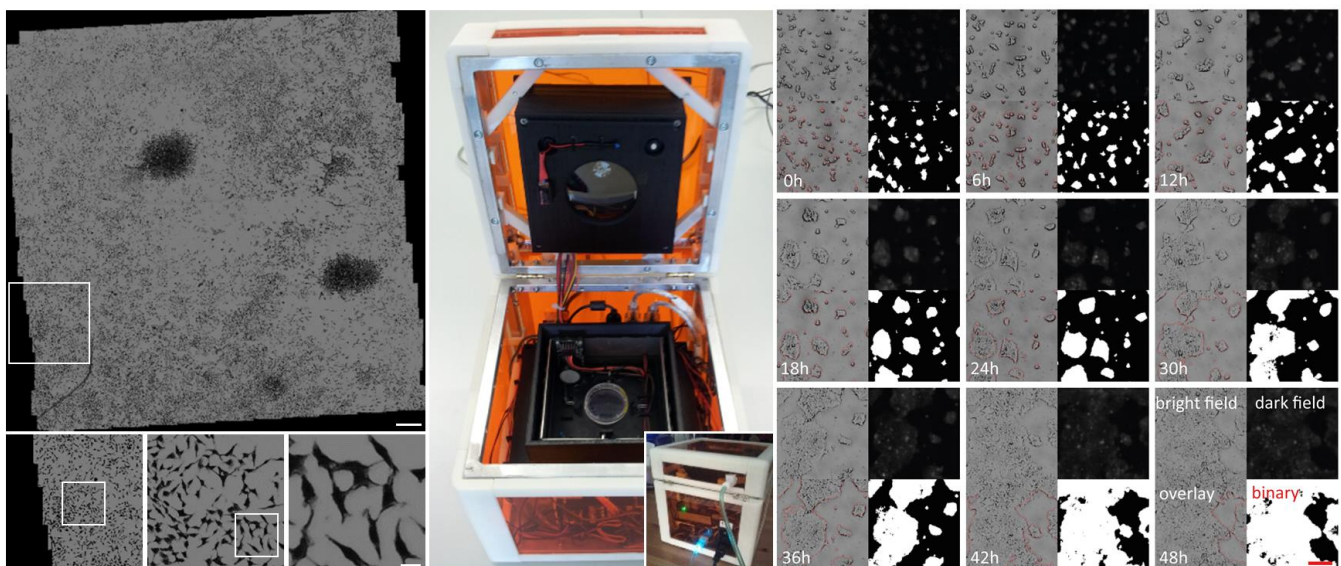




Rapid prototyping in life sciences: 3D printed, open source & low cost lab automation infrastructure for biomedical research and education

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High-throughput cell-based experimentation such as systematic screening for disease-relevant genes or bioactive molecules using large-scale libraries, relies on automation infrastructure that is typically proprietary, non-customizable, costly, and requires a high level of skill to use and maintain. The emergence of rapid prototyping technology including 3D-printing, open source microcontroller infrastructure and low cost consumer electronics, mechanics and robotics parts - also adopted by the *Maker* movement, a culture of do-it-yourself (DIY) product design - makes it possible to quickly and easily engineer customizable, user-friendly automation infrastructure of reduced cost and complexity.

In this colloquium, examples of rapidly prototyped lab automation infrastructure - engineered based on the *Maker's* approach and suitable to application in life sciences as well as for educational purposes - will be presented. These include a custom-designed high-content imaging robot for high-throughput screening analysis of ion channels using large-scale genetic or molecular libraries, a portable life-cell microscopy platform for long-term culture and analysis of cultured cells as well as further designs and developments to be applied in life sciences and also in various other fields of research.