

11<sup>th</sup> World Congress on

# CELL & TISSUE SCIENCE

May 09-10, 2018 Tokyo, Japan

## Orchestrating the topography and chemistry of cell microenvironment with contactless and mask-less quantitative photo-patterning

**Romuald Vally**  
Alveole, France

Cell biology is faced with significant challenges when attempting to create complex microenvironments to unravel intricate mechanisms involved in cell functions, cell and tissue development, cell adhesion, cell polarity, cell migration etc. These challenges can be overcome by molecular printing which involves the controlled deposition of molecules on a substrate at the micrometer scale. These approaches have developed tremendously in the past few years and micropatterned substrates are now routinely used for biological research. To yield biologically relevant data, printed biomolecules should mimic the complexity of the *in vivo* microenvironment. Micrometer-scale gradients of multiple proteins are thus highly desirable. Here we present PRIMO custom micro-patterning system for cell control which allows controlling the chemistry and topography of the cellular microenvironment and studying their impacts on cell development. This contactless and mask-less quantitative multi-protein photo-patterning solution is based on the Light-Induced Molecular Adsorption of Proteins (LIMAP) technology. The PRIMO system combines a UV illumination module and a specific Photoactivatable Reagent (PLPP). The combined action of UV-light and PLPP locally degrades antifouling polymer brushes allowing for the adsorption of proteins in a well-defined area. PRIMO relies on a wide-field DMD-based projection system coupled to an epi-fluorescence microscope to project custom-defined patterns of UV light onto all standard cell culture surfaces. As a result, micrometer scale patterns are generated within seconds. The remaining background allows for the sequential patterning of multiple proteins. Controlled protein gradients of custom-defined shape can also be patterned. In addition, PRIMO technology allows for micro-fabrication by photo-polymerization of UV-sensitive materials and also protein patterning onto pre-existing 3D surfaces. This new micro-patterning technology empowers biomedical research in neurobiology, immunology, stem cell biology, oncology and tissue engineering.

### Biography

Romuald Vally is the CEO of Alveole, has been In-Charge of Alvéole's Management and Development since 2016. He has acquired 10 years of professional experience mixing manufacturing and distributing medical equipment; first at Echosens and then at SEBAC.

romuald.vally@alveolelab.com

### Notes: