

## **Three-dimensional cell culture system as an in-vitro platform for lung cancer modelling**

Désirée BARUFFALDI - *Polytechnic University of Turin*

Non-small cell lung cancer (NSCLC) is a widespread tumor characterized by a complex and heterogeneous microenvironment. Since traditional 2D culture fails at resuming the complexity of in-vivo model, the aim of this work is to develop a 3D in-vitro device, mimicking the NSCLC niche, employing it as a more reliable platform for molecular studies and drug screening. Metacrylated gelatin (GelMA) is chosen as matrix for its good biocompatibility and the presence of motifs for cell adhesion. By modulating its degree of substitution and percentage, optimal conditions for cell growth are found. Further, co-cultures of tumor cells and fibroblasts are established to better resume the niche environment and dissect the role of the crosstalk that interplays between different cell types. Finally, since reproducibility is crucial for the reliability of in-vitro models, 3D bio-printing of our NSCLC model is being optimized. Next steps will be the introduction of a printed microfluidic system inside the scaffolds with the aim of mimicking physiological vasculature and of setting up a dynamic cell culture.