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**Long-term exposure to nanoplastics alters molecular
and functional traits related to the carcinogenic process**

**Barguilla, J. Domenech, S. Ballesteros, L. Rubio*,
R. Marcos, & A. Hernández¹**

*¹ Group of Mutagenesis, Department of Genetics and Microbiology, Faculty of
Biosciences, Universitat Autònoma de Barcelona,
Cerdanyola del Vallès, Barcelona, Spain*

** laura.rubio@uab.cat*

Micro/nanoplastics (MNPLs) are considered emergent pollutants widely spread over all environmental compartments. Although their potential biological effects are being intensively evaluated, many doubts remain about their potential health effects in humans. One of the most underdeveloped fields is the determination of the potential tumorigenic risk of MNPLs exposure. To shed light on this topic, we have designed a wide battery of different hallmarks of cancer applied to prone-to-transformed progress MEF cells exposed to polystyrene nanoplastics (PSNPLs) in the long term (6 months). Interestingly, most of the evaluated hallmarks of cancer are exacerbated after exposure, independently if they are associated with an early tumoral phenotype (changes in stress-related genes, or microRNA deregulation), advanced tumoral phenotype (growing independently of anchorage ability, and migration capacity), or an aggressive tumoral phenotype (invasion potential, changes in pluripotency markers, and ability to grow to form tumorspheres). This set of obtained data constitutes a relevant warning on the potential carcinogenic risk associated with long-term exposures to MNPLs, specifically that induced by the PSNPLs evaluated in this study.

Keywords:

Carcinogenesis; Long-term exposure; Oncogenic phenotype; Polystyrene nanoplastic.