

The BIOPLAST4SAFE project

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Over the last 50 years, plastic production and consumption have grown exponentially: i) 589 million metric tons of plastic were produced in 2025; ii) almost 90% of the sea surface is polluted by plastic waste, iii) an increase of another order of magnitude is expected in the next years. Plastic objects when released into the environment, mainly due to atmospheric agents such as temperature variations and solar radiation, are fragmented forming micro- (0.1-5000 micrometers) and nano-plastics (0.001-0.1 micrometers) (MNPs). It is precisely these smaller particles that have attracted growing attention from international institutions and politics because they are considered among the main causes of a new form of environmental pollution being a potential source of risk for humans, due to their potential accumulation in fish and shellfish. The European strategy 2020-2030 aims to reduce, reuse and recycle non-biodegradable plastic in circular economy perspective. At the same time, biodegradable plastics constitute a small share of the market (0.3% of global production capacity). The European strategy recognizes the potential of biodegradable plastics in some applications and the efforts made in the field of innovation to generate products that comply with the concept of Safe and Sustainable by Design, however the increased use of biodegradable polymers in commercial products, especially in food packaging, raises concerns about the safety of these products for the environment and human health, considering that for these polymers there are still few evaluations regarding the effects of their micro- and nanometric forms. The BIOPLAST4SAFE, funded by the Italian Ministry of Health – PNC, is intended to fill some of the gaps into the current knowledge and focuses on two main actions: i) Action 1 - promote applied research, through multidisciplinary approaches, for the study of the chemical-physical and morphological characteristics, environmental and human fate and potential toxic effects (on different trophic levels from the environment to humans) of micro- and nano-plastics deriving in particular from biodegradable polymers; ii) Action 2 - promote, develop and support the regulatory framework for the management of chemical substances/chemical products, including plastic materials.