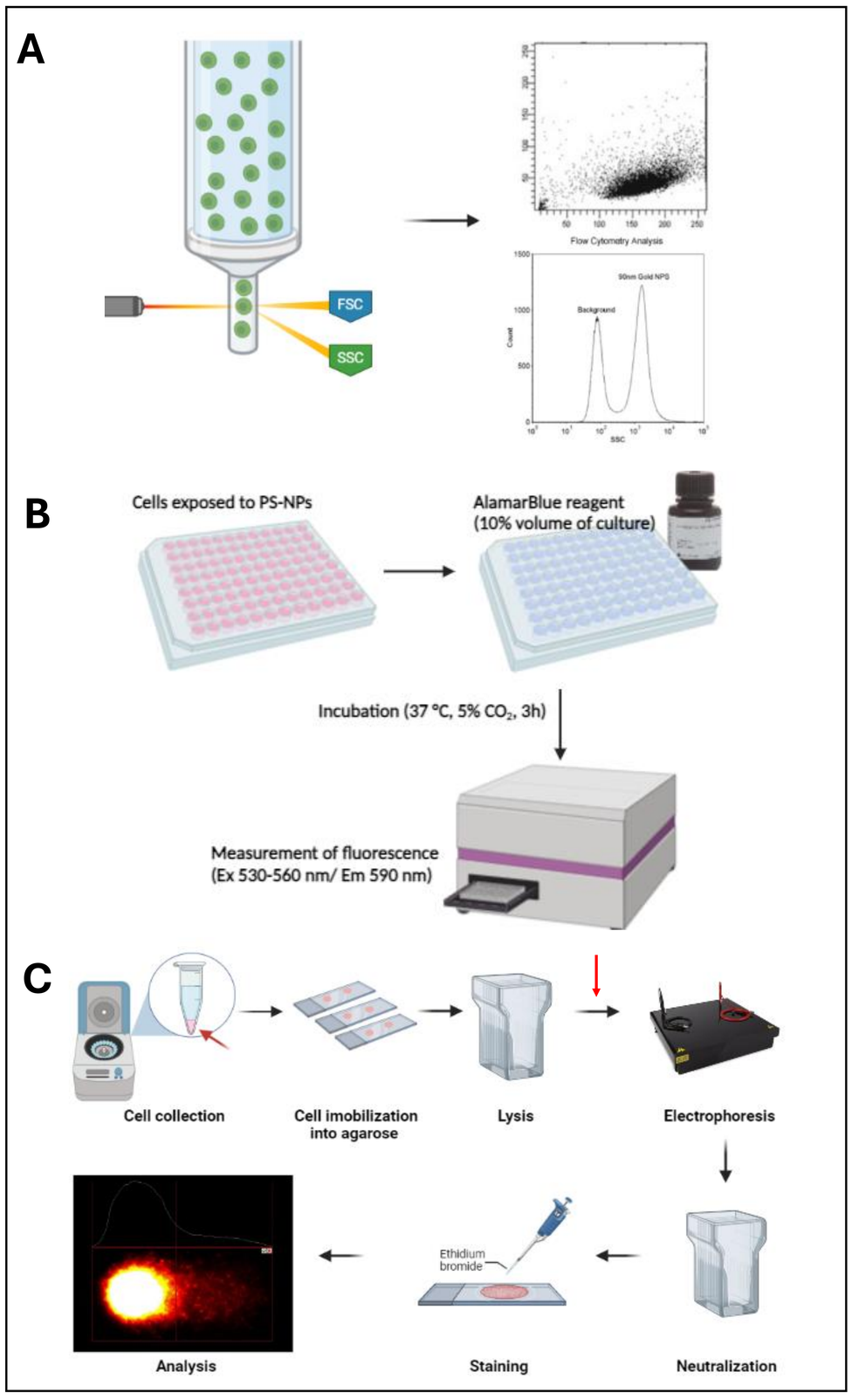
It looks like **nanoplastic particles found a way to** get under **our skin and our DNA**

Analysis of *in vitro* Cytotoxicity and Genotoxicity of Polystyrene Nanoparticles in Human Hepatoma Cell Line (HepG2)

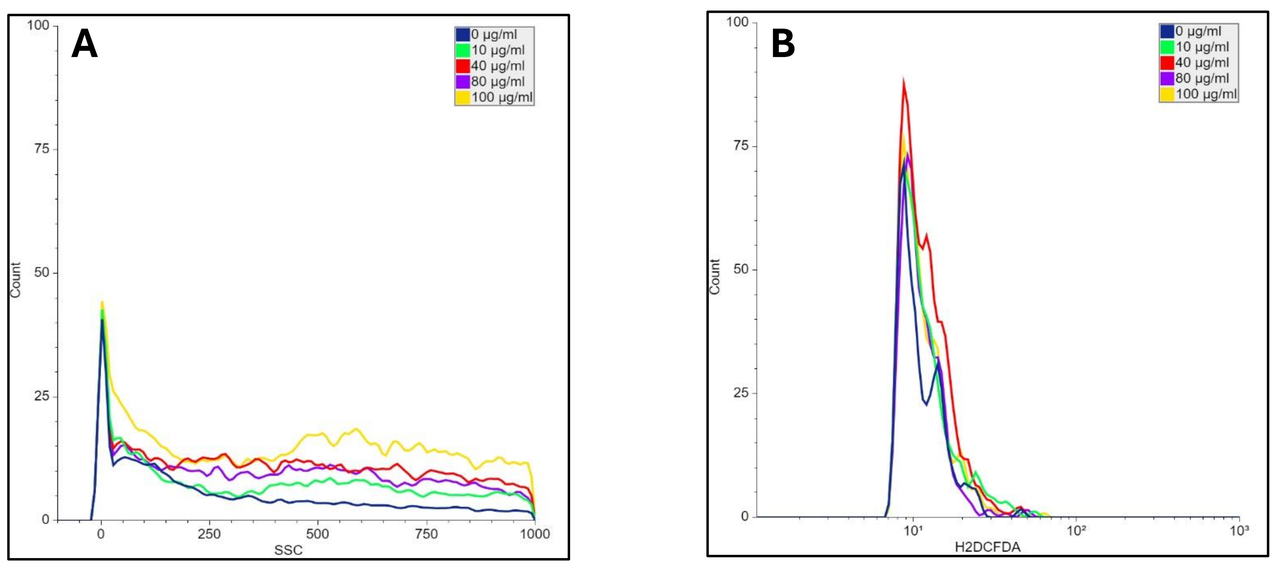
Introduction. Plastics can persist in the environment for hundreds of years and have the potential to degrade into micro- and nanoparticles. Among these, polystyrene nanoparticles (PS-NPs) are commonly used in various applications like food packaging and bioimaging. It is important to conduct genotoxicity studies to assess the potential harm caused by these nanoparticles. **The aim of this study was to assess the cytotoxicity and genotoxicity of polystyrene nanoparticles (PS-NPs) in a human hepatoma cell line (HepG2) *in vitro*.**

Methodology overview. (**A**) Flow cytometry for PS-NPs uptake and ROS measurement, using H_2DCFDA dye. (**B**) AlamarBlue assay for cytotoxicity testing. (**C**) Alkaline and Enzyme-modified (EM) comet assays for genotoxicity testing.

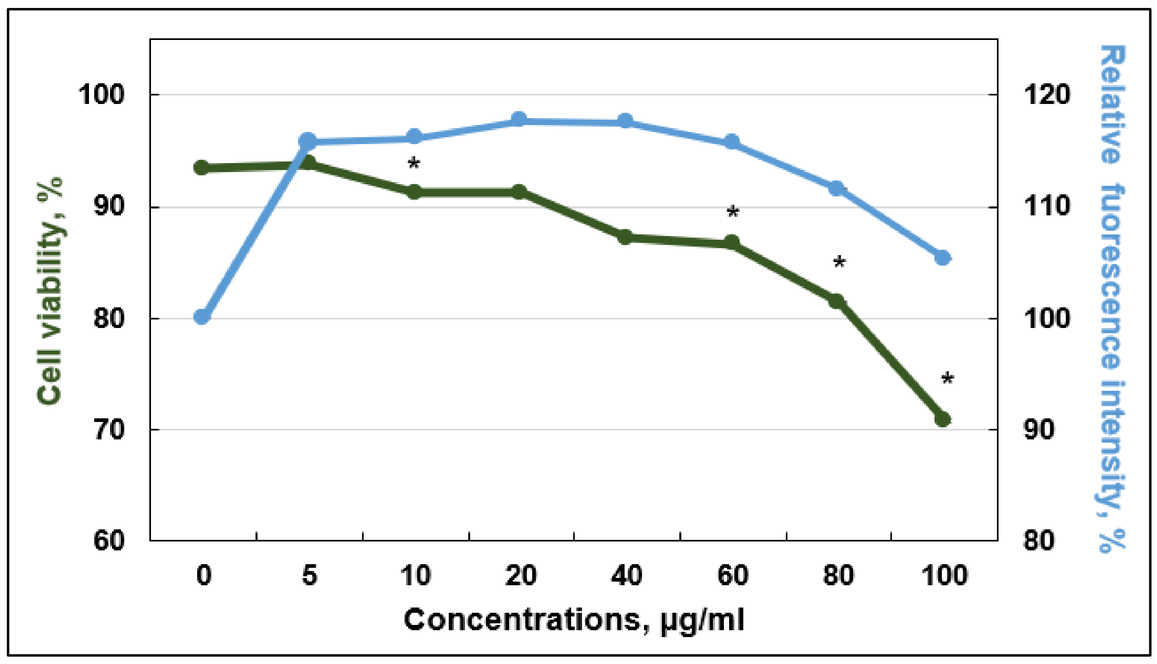


Results

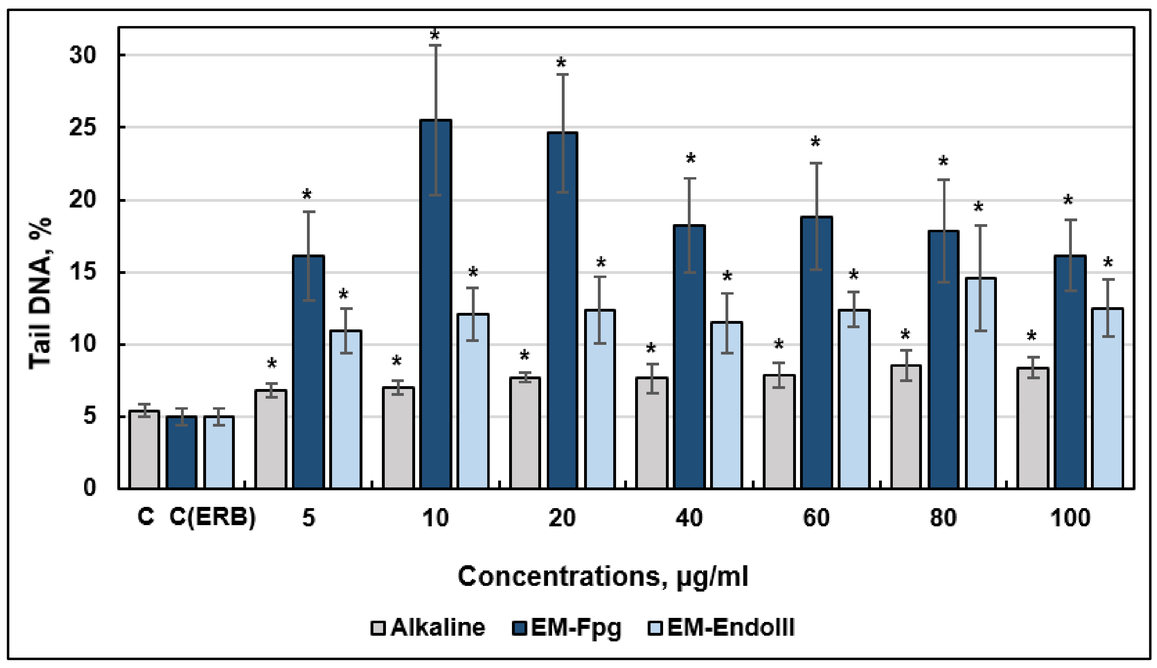
1. Flow cytometry results. (**A**) PS-NPs were efficiently taken up by the HepG2 cells. (**B**) Compared to the negative control, ROS generation is more pronounced in the cells exposed to PS-NPs.



2. Cytotoxicity results. The cytotoxicity of HepG2 cells was assessed by methods based on cell metabolic activity (**AlamarBlue**) and cell permeability (**TrypanBlue**). Both assays showed that polystyrene nanoparticles are non-cytotoxic in HepG2 cells.



3. Genotoxicity results. All concentrations of PS nanoparticles tested (5-100 µg/ml) induced statistically significant levels of primary and oxidative DNA damage in HepG2 cells.



Emilija Striogaitė[1], Milda Babonaitė[1], Juozas Rimantas Lazutka[1]
[1]Department of Botany and Genetics, Institute of Biosciences, Vilnius University, Vilnius, Lithuania
emy.striogaite@gmail.com

Vilnius University