METHODS FOR THE INVESTIGATION OF CYTOTOXICITY AND GENOTOXICITY OF AIR SAMPLES

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Air pollution means the presence of a mixture of solid particles and gases in the air. This significantly harms human health and the environment. Though in Europe, there is a substantial improvement in air quality in the last decades, the concentrations of different air pollutants are still too high.

The Department of Microbiology started to take part in a project (TÁMOP-4.2.2.A-11/1/KONV-2012-0047) in which a multidisciplinary research action targets practical aspects (e.g. detection) of air pollution. In the frame of this, cytotoxicity and genotoxicity investigations are in progress with filters derived from various air sampling sites. Experiments were started to work out methodologically solid sample processing protocol. Gentle sample pre-processing method applied, which ensure, that besides bulk of the toxic compounds get to solution from the filter, the samples become germ free. The filter extracts are processed in Eppendorf-tubes in a high frequency Eppendorf-tube shaker, with sterile glass beads. An important task is the removal of the heat and radiation resistant *Bacillus* spores which are present in substantial amount on the surface of the air filters. Instead of heat or radiation treatments – which other ways could cause undesired chemical reactions with the toxic compounds – the extracts are centrifuged through a nitrocellulose membrane (0.22 micron pore size) containing spin column. With the germfree extracts citotoxicity investigations are performed with *Pseudomonas putida* test strain in a microplate-based cultivation system. The growth of the *Pseudomonas* cultures is followed with turbidimetry with microtiter plate photometer. Genotoxicity investigations are carried out with the same extracts applied in Ames tests with the TA98 and TA 1535 *Salmonella typhimurium* tester strains.

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