Presentation title: The Influence of the Concentration of Plastic Particles in the Air on the Level of Cytokines

Corresponding Author name: Visileanu Emilia

Ph. No.: 0722542851

Email ID's: e.visileanu@incdtp.ro

WhatsApp No:0722542851

Other Authors if any: Alexandrea Gabriela Ene, Catalin Grosu, Alina Vladu, Razvan Scarlat

Presentation type: Oral presentation

ABSTRACT

Microplastics were initially reported in 2004, and the potential adverse effects on living organisms have recently attracted considerable attention. Microplastics are defined as artificial polymer particles with a size less than or equal to 5 mm. Cytokines are signalling proteins that help control inflammation in the human body. They allow the immune system to mount a defence if germs or other substances that can make you sick enter the body. Too many cytokines can lead to excess inflammation and conditions like autoimmune diseases. An important component of the solid particles that generate air pollution in the textile industry are microplastics (MP) and nanoplastics (NP), which also include microfibers (<5mm) and nanofibers (<100 nm), respectively. The particles released into the air during fibre and yarn processing range from 1 µg/m3 to 50 µg/m3. The work presents cytokine levels measured in the plasma of biological samples (blood) collected from people who work in an environment containing plastic nanoparticles generated in the processing of synthetic garments (polyester). An online recording system such as the Laser Aerosol Spectrometer MINI LAS model 11-E is used to determine the concentration and number of NMP in the air. The collection of whole blood, in Na-heparin plastic vacutainers and the processing of biological samples (blood) is described in the dedicated SOP. The cytokine levels of IL8, IL10 and TNFa in 8 samples, 3 different time points each were assessed. ID codes 1-4 and 16 – 19 were used, timepoints 1 – 3. Overall, the cytokine levels are very low. Some variation noticeable between timepoints within the same ID, and between samples was observed. Most levels are not within the linear part of the standard curve but in the lower end. The proteins might bind to the viscous, white part, resulting in an underestimation of the cytokine levels. The presence of possible contaminants is checked. A possible correlation between the concentration of plastic particles in the air and the level of cytokines in the blood is analysed.

Biography

Emilia Visileanu is a scientific researcher in the first degree and a Ph.D. in sciences since 1996. During 1997-2011 General Manager of INCDTP Bucharest. The research activity focused on the topic of more than 100 national and international projects (FP V, FP VI, FP VII, EUREKA, MANU NET, ERASMUS + etc.) both as project manager and member in the inter and transdisciplinary teams. Expertise in smart textile materials obtained by classical and unconventional (electrospinning) technologies, technologies for functionalization textile materials with NP and studies on the influence of NPs on human health, textile medical devices (bandages, 3D textile structures for hernias and eventration, composite structures for healing burns etc.).The research activity was disseminated by publishing over 100 scientific papers in journals and proceedings volumes indexed by ISI/BDI, books and chapters of specialized books, and 27 patents.