

How Nail Salon Toxins Affect Cognitive Degradation

Common overlooked harms within a nail salon include microplastics from the filing process, ethyl methacrylate (EMA) from acrylic nails, hydroxyethyl methacrylate (HEMA) from gel polishes, and acetone from the removal of polishes. This study investigates the effects of these toxins on the genes Choline O-acetyltransferase (CHAT), solute carrier family 5 member A7 (SLC5A7), and 8-oxoguanine DNA glycosylase (hOGG1). The *Drosophila* were first put into containers with EMA and acetone in beakers, microplastics in the medium, and HEMA piped along the sides of the vials to replicate a nail salon environment. They were then left there for 24 vs 48 hours along with differing microplastic concentrations of 0.7g and 0.3g. The first assay was an Acetylcholine ELISA which aimed to quantify the output of the genes SLC5A7 and CHAT, that are both involved in the production of acetylcholine. The results of this assay indicate that the high exposure treatment group had the least amount of acetylcholine output ($p < 0.5$) while the negative control had the greatest amount of acetylcholine output. The second assay was a reactive oxygen species (ROS) detection assay that aimed to measure the output of the gene hOGG1 which maintains oxidative stress response genes. The results showed that the low exposure group had the greatest ROS output and the high exposure had the least ROS ($p > 0.05$). Therefore, the toxins can not be linked to the gene hOGG1 and the toxins can only be linked to the genes CHAT and SLC5A7.