

**Flame retardants** are industrial compounds contained in high quantities in various manufactured goods (e.g. furniture and electronic devices) to make them less flammable, and everybody is exposed to them both at home, in the workplace and in the environment (where they leak and disperse from waste). They are complex organic molecules with bromine, chlorine and/or phosphorus atoms, which is important for their non-flammable character, but unfortunately makes them difficult to break down in the environment or in the body, so they are classified as **persistent organic pollutants**. They are known to be bad for your health in various ways, but scientific proof of their toxicity rests on very general measures (results rather than direct mechanisms of toxicity). It is specifically suspected that these compounds can compromise your **immune system** which protects you from infectious diseases, but their mode of action in this respect is unknown. This project has a double goal: accumulation of data on molecules in cells of the human immune system that can be modified/damaged by flame retardants (to provide scientific basis for setting exposure limits, e.g. for concentrations in household objects), and verification of a new theory that many of these effects are related to flame retardant molecules being fat-soluble rather than water-soluble (and thus can damage the function of fatty cellular membranes). Our research will include the **treatment of cells cultured in the laboratory** with flame retardants and subsequently measurement of various biochemical and genetic features of these cells to see which of them are changed for the worse. We will also perform **experiments on laboratory rats** in order to confirm the biochemical mechanisms of deleterious effects in the immune system. This will help verify exactly how bad those chemicals really are for immunity and whether further experiments in animals and humans are needed.