Safety evaluations and Risk assessment for human protection is historically and up to nowadays based on some long-established practices and assumptions for hazard identification and characterisation, such as a) testing in high doses, b) testing only of single chemicals, and c) linear extrapolation to low doses. Though these practices were considered handy and useful for many decades, it is now globally recognised that they are not simulated real life conditions. Real life risk is coming from the exposure to complex mixtures of many different chemicals and their toxicity in mixtures might be altered in relation of their toxicity when studied in isolation. In addition, real life exposure is mainly exposure to low doses. However, the assumption that low dose's toxicity is covered from experimentation in high doses because all effects are following a linear and monotonic dose-response curve, is seriously challenged through a number ofstudies of the last three decades. As many of the technical drawbacks of the past are nowadays eliminated and new technologies and methodologies are available, we consider that it is time to go ahead with toxicology for Real Life Risk Simulation. As more are known in relation to real life combined exposure, we focus our research in an area with complete lack of data, meaning the low-dose-long-term toxicity testing of complex chemicals' mixtures that simulates real life exposure. The Toxicology of the 21st century faces with the challenge of explain why from epidemiological studies we found that chemicals in doses consider safety are important factors that lead to the development of different chronic diseases. Precision medicine approach based on metabolome, genome, and microbiome relate data on the effect of toxic exposure to the phenotype. Toxic exposure inflicts damage at metabolic, genetic and microbiome levels, increasing thus cellular turnover, telomere attrition and the rate of aging. Data from our ongoing research in this direction will be presented.