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Common good practices in biomarker development in toxicology

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EU-COST DiMoPEx Action is based on developing new concepts for a better understanding of health-environment interactions in the etiology of non communicable diseases. DiMoPEx partners have identified some of the emerging research needs, which include the lack of evidence-based exposure data, the need for human-equivalent animal models implying human life- span and low dose cumulative exposures. To record environmental health exposures and internal hazard absorption, human biomonitoring is the most suitable strategy. Biomarkers used can be any substances that are measureable and indicate exposure or susceptibility or that predict the incidence or outcome of disease. The choice of the relevant marker depends on the sampling time and the knowledge of foreign substance metabolism. However, there are no magic biomonitoring biomarkers that fulfill the criteria of both substance specificity and provision of an integrated estimate of individual health risk. To improve the characterization of possible risks to health, dose monitoring should be complemented by studies of biological effects. A biomarker of exposure should be specific for the chemical, be detectable in small quantities, and be associated with prior exposure. A biological marker that is pertinent to the preclinical lesions of a disease is likely to be an excellent positive predictor of disease status. The newest developments in effect biomonitoring have been able to bridge the gaps in the clarification of a potential association between exposure and the development of disease.

Keywords

Environmental health exposures, human biomonitoring, biomonitoring biomarkers, human-equivalent animal models, non-communicable diseases

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