Exploring the Exposome

Exposomics impact on human health

From the moment a baby is conceived, genes control their development and health, but they don't do it alone. The exposome influences, for better or worse, the genes and proteins they code for. A better understanding of the exposome would help scientists identify how nongenetic factors influence biological reactions and possibly contribute to the development of chronic diseases.

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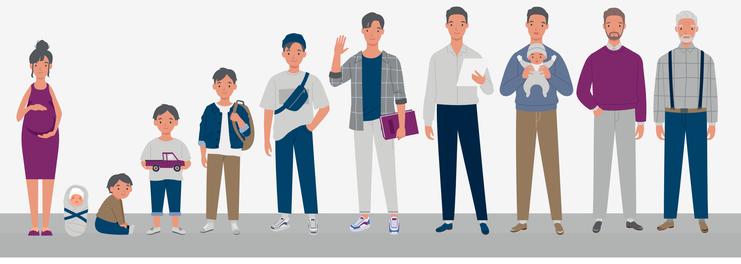
What is the Exposome?

The exposome can be defined as the total sum of all exposures from conception onwards.[1] The human exposome is the environmental equivalent of the human genome. It represents the complex exposures humans are subjected to throughout their lifetime manifested in individuals' internal chemical environment.



Why Study the Exposome?

One of the promises of the human genome project[7] was that it would revolutionize our understanding of the underlying causes of disease and aid in the development of preventions and cures for more diseases.

A Lifetime of Exposures

Human aging from conception to childbirth through adolescence and adulthood to old age is riddled with exposures to the chemicals in the environment.

Nature vs. Nurture

Environmental and lifestyle factors are equally or even more important than genetics in determining susceptibility, onset, and exacerbation of human disease.[4]

A New Era in Environmental Health Science

Considering health-risk assessment, the exposome paradigm opens the door to a new era in environmental health science and chemical risk assessment.[4]

Undertaking the Challenge

Exposures are vast, dynamic, and diverse. Characterizing the exposome begins with measuring as many circulating chemicals as possible in a population to identify putative associations with adverse outcomes followed by hypothesis driven studies to confirm the findings.[6]

Agilent Solutions

Exploring the exposome requires identification, characterization, and quantification of the exogenous and endogenous exposures that humans encounter, as well as modifiable risk factors that predispose a person to disease(s) throughout their lifespan.[4]

Agilent MassHunter Profiler Professional

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Agilent ICP - MS

Agilent GC/Q -TOF

Agilent LC/Q -TOF

Agilent Real -Time PCR

Triple Quadrupole LC/MS

Sources:

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