A computational approach to chemical etiologies of diabetes. - DTU Orbit (09/11/2017)

A computational approach to chemical etiologies of diabetes.

Computational meta-analysis can link environmental chemicals to genes and proteins involved in human diseases, thereby elucidating possible etiologies and pathogeneses of non-communicable diseases. We used an integrated computational systems biology approach to examine possible pathogenetic linkages in type 2 diabetes (T2D) through genome-wide associations, disease similarities, and published empirical evidence. Ten environmental chemicals were found to be potentially linked to T2D, the highest scores were observed for arsenic, 2,3,7,8-tetrachlorodibenzo-p-dioxin, hexachlorobenzene, and perfluorooctanoic acid. For these substances we integrated disease and pathway annotations on top of protein interactions to reveal possible pathogenetic pathways that deserve empirical testing. The approach is general and can address other public health concerns in addition to identifying diabetogenic chemicals, and offers thus promising guidance for future research in regard to the etiology and pathogenesis of complex diseases.

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