Precision Environmental Health Science

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Precision Medicine, "getting the right drug to the right patient to treat the right disease", has replaced the old trial and error strategy for finding the most effective treatments for patients. Analogous to Precision Medicine, where treatments are tailored to the individual and specific disease, Precision Environmental Health has the goal of individualized risk assessment and interventions to prevent disease. Precision Medicine and Precision Environmental Health are similar in the use of "omic" data, but differ in the former has the goal of disease treatment, while the later focuses on disease prevention. The ultimate goal of Precision Environmental Health is to reduce the adverse health effects of exposures that make their way to us through the air we breathe, the water we drink, and the food we eat by identifying individuals who are specifically susceptible to environmental threats and enabling precise, targeted, and effective prevention. Exciting advances in Precision Environmental Health Research are occurring at the intersection of genomics/epigenomics, environmental health, and data science. This research is providing new knowledge regarding mechanisms by which environmental exposures cause disease, increasing our understanding the basis of inter-individual differences in disease susceptibility, enabling development of biomarkers of exposure and disease risk, advancing risk prediction, and facilitating the development and delivery of interventions to prevent disease that are tailored to the individual rather than the population as a whole.