
{GEN x EPI} x E => P: A systems approach to (epi)genetic inheritance and evolution

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Abstract

We propose to revisit the initial notion of the GxE concept, meaning that genotype x epigenotype interactions bring about the phenotype, and we propose an extension to this concept. Here G would be replaced by "Inheritance system". This system would then be composed of at least two elements: the genotype "GEN" and the epigenotype "EPI". They interact as a dual inheritance system {GEN x EPI} with the environment E, to bring about the phenotype P (i.e. {GEN x EPI}x E => P). The elements of this system (GEN and EPI) will now be defined using their molecular nature, i.e. the DNA for GEN and the bearers of epigenetic information for EPI. Advantages of this view will be discussed, and examples in host-parasite/symbionte interactions will be presented.

Keywords: epigenetics, evolution, parasite

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