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CE > Vol.3 No.6A, October 2012

OPEN ACCESS

Analogies for Teaching Mutant Allele Dominance Concepts

PDF (Size: 910KB) PP. 884-889 DOI: 10.4236/ce.2012.326133

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ABSTRACT

Analogies connect new and familiar concepts and ideas by providing a comfortable and known framework within which students can integrate new concepts. Use of analogies to aid understanding of abstract and/or complex ideas is commonly used in molecular sciences, such as genetics, molecular biology, and biochemistry. Five analogies for different mechanisms of mutant allele dominance, a seemingly counter-intuitive idea in genetics, were designed and assessed in an upper division undergraduate/masters level course. Each of the five mechanisms, haploinsufficiency, acquired function, poison product, increased activity, and inappropriate expression, was described in the context of a human disease and molecular mechanism and followed by a descriptive analogy which mirrored the molecular mechanism using real world items or a video clip. The majority of students reported increased interest, understanding, and engagement following the analogies, as well as decreased confusion.

KEYWORDS

Analogy; Genetics; Allele Dominance

Cite this paper

Seipelt-Thiemann, R. (2012). Analogies for Teaching Mutant Allele Dominance Concepts. *Creative Education*, 3, 884-889. doi: 10.4236/ce.2012.326133.

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