Apr 14th, 9:00 AM - 10:00 AM

The Phylogenetic Distribution of Porphobilinogen Synthase (PBGS) Among Invertebrate Phyla: An Investigation of the Presence of PBGS in Nematostella Vectensis

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Poster Presentation P71

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The enzyme porphobilinogen synthase (PBGS) is known to catalyze the biosynthesis of tetrapyrroles such as heme and chlorophyll. The PBGS enzyme has been found in microorganisms, plants, vertebrate and invertebrate animals. This study was an investigation of the phylogenetic distribution of PBGS among invertebrate phyla. There is one example of an animal that lacks the PBGS enzyme, Caenorhabditis elegans (phylum Nematoda), thereby necessitating the acquisition of tetrapyrroles from its diet. Using a standard assay for PBGS, the presence of the enzyme was confirmed in the photosynthetic bacterium Rhodobacter capsulatus. No evidence of PBGS activity was demonstrated in Nematostella vectensis, a sea anemone (phylum Cnidaria); although, it was established that the Nematostella vectensis contained heme using a qualitative pyridine hemochromogen method.