Papers of the Week

Clarifying the Mono- versus Di-oxygenase Controversy Surrounding Carotenoid Cleavage Oxygenases

* See referenced article, *J. Biol. Chem.* 2015, 290, 30212–30223

Utilization of Dioxgen by Carotenoid Cleavage Oxygenases

Carotenoid cleavage oxygenases (CCOs) are enzymes that are a part of metabolic pathways involving carotenoids, which are naturally occurring pigments, and related compounds. CCOs are found in all life forms. The RPE65 sub-group of CCOs, which are only found in vertebrates, catalyzes a concerted ester cleavage reaction and trans-cis isomerization of all-trans-retinyl esters. But researchers do not fully understand whether both mono- and di-oxygenases exist within the CCO enzyme family. In this Paper of the Week, a team led by Krzysztof Palczewski at Case Western Reserve University demonstrated that apocarotenoid- and stilbene-cleaving CCOs from distantly related lineages both function as dioxygenases. They also showed that bovine RPE65 did not rely on O₂ for its cleavage/isomerase activity on all-trans-retinyl esters. The authors say, “These data provide compelling evidence for a common dioxygenase mechanism amongst all double bond cleaving CCOs.”

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In *vitro* isotope-labeling analysis of the apocarotenoid oxygenase-catalyzed reaction.
Enzymology:
Clarifying the Mono- versus Di-oxygenase Controversy Surrounding Carotenoid Cleavage Oxygenases*: Utilization of Dioxide by Carotenoid Cleavage Oxygenases

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