

Webinar « Photosynthesis and Metabolism »

December 2nd, 2021

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Holliday junction resolvase MOC1 mediates plastid and mitochondrial genome segregation

When DNA double-strand breaks occur, four-stranded DNA structures called Holliday junctions (HJs) form during homologous recombination. Because HJs connect homologous DNA by a covalent link, resolution of HJ is crucial to terminate homologous recombination and segregate the pair of DNA molecules faithfully. We recently identified Monokaryotic Chloroplast1 (MOC1) as a plastid DNA HJ resolvase in algae and plants. Although Cruciform cutting endonuclease1 (CCE1) was identified as a mitochondrial DNA HJ resolvase in yeasts, homologs or other mitochondrial HJ resolvases have not been identified in other eukaryotes. We found that MOC1 dually targeted to plastids and mitochondria in some land plant lineages, such as the moss *Physcomitrella patens*, a liverwort and a fern. Moreover, mitochondrial targeting of MOC1 was also predicted in charophyte algae and some land plant species. Taken together, we propose that MOC1 resolves HJs in mitochondria of some lineages of algae and plants as well as in plastids in algae and plants.