A new type of flexible CP12 protein in the marine diatom *Thalassiosira pseudonana*

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Video Byte

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Abstract

Chloroplast protein of 12 kDa (CP12) participates in the Calvin Benson Bassham (CBB) cycle and many other processes in higher plants, microalgae, and cyanobacteria. The CP12-encoding gene is conserved in many diatoms, but CBB cycle regulation differs between diatoms and other photosynthetic organisms, and CP12 has not been characterized in these ecologically important and evolutionarily complex microalgae. A recent study addressed this knowledge gap by characterizing CP12 in the marine diatom *Thalassiosira pseudonana*. Using a variety of techniques, researchers found that this CP12 is expressed under both light and dark conditions and throughout growth and that it exhibits some features of intrinsically disordered proteins, like CP12 proteins in other organisms. The protein is an elongated cylinder with kinks and numerous unstable dynamic α -helices. In addition, it exists as a dimer, in contrast to previously characterized monomeric CP12s. The structural findings and in silico predictions suggest that both disordered regions and coiled coils are present. Overall, the results increase our understanding of the diversity of CP12s and support further research on the roles of previously understudied CP12s in photosynthesis, stress responses, and other processes in diatoms.