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**Kinetic characterization and structural modeling of an NADP<sup>+</sup>-dependent succinic semialdehyde dehydrogenase from *Anabaena* sp. PCC7120**

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<sup>1</sup> These authors contributed equally to this work. Succinic semialdehyde dehydrogenases (SSADH) of cyanobacteria played a pivotal role in completing the cyanobacterial tricarboxylic acid cycle. The structural information of cofactor preference and catalysis for SSADH from cyanobacteria is currently available. However, the detailed kinetics of SSADH from cyanobacteria were not characterized yet. In this study, an *all3556* gene encoding SSADH from *Anabaena* sp. PCC7120 (ApSSADH) was amplified and the recombinant ApSSADH was purified homogenously. Kinetic analysis showed that ApSSADH was an NADP<sup>+</sup>-dependent SSADH, which utilized NADP<sup>+</sup> and succinic semialdehyde (SSA) as its preferred substrates and the activity of ApSSADH was inhibited by its substrate of SSA. At the same time, the Ser157 residue was found to function as the determinant of cofactor preference. Further study demonstrated that

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