Plant α-glucan phosphatases SEX4 and LSF2 display different affinity for amylopectin and amylose - DTU Orbit (08/11/2017)

Plant α-glucan phosphatases SEX4 and LSF2 display different affinity for amylopectin and amylose

The plant glucan phosphatases Starch EXcess 4 (SEX4) and Like Sex Four2 (LSF2) apply different starch binding mechanisms. SEX4 contains a carbohydrate binding module, and LSF2 has two surface binding sites (SBSs). We determined K_{Dapp} for amylopectin and amylose, and KD for β-cyclodextrin and validated binding site mutants deploying affinity gel electrophoresis (AGE) and surface plasmon resonance. SEX4 has a higher affinity for amylopectin; LSF2 prefers amylose and β-cyclodextrin. SEX4 has 50-fold lower K_{Dapp} for amylopectin compared to LSF2. Molecular dynamics simulations and AGE data both support long-distance mutual effects of binding at SBSs and the active site in LSF2.

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