

**Role of the N-terminal starch binding domains on kinetic properties of starch
synthase III from *Arabidopsis thaliana*.**

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The starch-synthase III (SSIII) is one of the SS isoforms involved in plants starch synthesis and it has been reported that it has a regulatory role in the synthesis of transient starch. SSIII from *Arabidopsis thaliana* contains 1025 aminoacidic residues and possesses an N-terminal transit peptide for chloroplast localization, followed by a specific domain (SSIII-SD, residues 20 to 591) containing three internal repeats and a C-terminal catalytic domain, similar to bacterial glycogen synthases (residues 591 to 1025). We previously described that each of the three internal repeats encodes a starch-binding domain (SBD). In the present work, we constructed recombinant full length and truncated isoforms of SSIII in order to determine the function of the SBDs in the enzyme. Results revealed that the SSIII proteins could use ADPGlc or UDPGlc as substrates. Moreover, the addition of each SBD confers particular properties to each isoform, increasing the apparent affinity for the oligosaccharide substrate. The results presented here suggest that the N-terminal SBDs have a regulatory role, modulating the catalytic properties of SSIII.

Keywords: *Arabidopsis*, starch synthase, starch binding domain