Modulation of an alpha-amylase by synthetic peptides based on surfactin

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A number of designed non-cyclic peptides derived from the sequence of surfactin, a cyclic decapeptide with surfactant and antibiotic properties produced by strains of Bacillus subtilis, was synthesized, and their effects on the modulation of an alpha-amylase from Photobacterium profundum were tested. Each one of the peptides was added to the amylase medium in concentrations increasing from 0.025 to 5 µM. Amylase activity was assayed with 0.5% starch for 20 min, at 35°C. The formation of reducing sugars was measured with the DNS method. The peptides demonstrated different effects depending on their sequence. As a general rule, they presented a biphasic behavior, initially activating the amylase, at submicromolar concentrations, and later inhibiting it while reaching the micromolar range. This was very similar to what was obtained by adding SDS as surfactant at similar concentrations. Although further studies are needed, our results indicate that biodegradable synthetic peptides derived from the structure of surfactin might be interesting and suitable surfactants for diverse applications.

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