Thermal–induced Unfolding of *Staphylococcus xylosus* Lipase Detected by Circular Dichroism

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Lipolytic enzymes have potential applications in many fields of biotechnology because of their broad catalytic spectrum of biochemical reactions, and also for their capacity to detoxify many chemical compounds. A large number of lipases have been screened for applications in various industries including those for pharmaceuticals, foods and detergents *Staphylococcus xylosus* lipase (SXL) is one of these lipases. Although there are many studies on biochemical characterization of SXL, there are no structural and biophysical reports of this enzyme, which implicates a poor understanding of its biological/chemical function. In this work we assessed the secondary structure of a recently isolated recombinant clone of SXL and followed the protein unfolding, during thermal denaturation using CD spectroscopy. CD spectra were recorded on a Jasco J-815 spectrometer with a Peltier temperature control unit with scans from 195 to 280 nm at 20°C, 40°C and 100°C. SXL has a typical a-helix profile (49.65%), minima in 208 nm and 222 nm, and is included on the a/ß-hydrolases family. The thermal treatment revealed that SXL displayed a thermostable profile (Tm 55°C). The a-helix content was reduced to maximum 22.98% at 100°C, which represents a putative thermal resistance of the protein. This high temperature resistance profile is reinforced by SXL refolding at 20°C when the protein shows a slight increase of a-helix content. These results demonstrate a natural tendency of the protein to refold, which is considered an important characteristic in industrial processes.

Keywords: *Staphylococcus xylosus* lipase, CD spectroscopy, a/ß-hydrolase

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