

Effects of the Polyamines in the Activity of Proton Pumps in Embryogenic Cultures of *Araucaria angustifolia*

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The polyamines (PAs) putrescine (Put), spermidine (Spd) and spermine (Spm) are related to various processes of plant development, including somatic embryogenesis and modulation of the hydrolytic activity in proton pumps. However, it is still not clear how PAs can modulate the pumps activities during somatic embryogenesis process. The aim of this study was to evaluate the effects of different PAs in the H⁺-ATPases (types P and V) and H⁺-PPase activities in embryogenic cultures of *A. Angustifolia*. Put, Spd and Spm were supplied into the BM culture medium at 1.0 mM concentration. After 21 days of culture, the activities of ATPases and H⁺-PPase were analyzed. Different PAs showed no effects in the activity of the P-type H⁺-ATPase. However, these PAs showed significant effects on the vacuolar pumps activities, V-ATPase and H⁺-PPase. Cultures supplemented with Put showed higher ATPasic activity, while Spd and Spm stimulated PPasic activity. The activation of the V-ATPase by Put may represent a key element of the process of cell division and growth upon high cellular ATP levels, condition in which the V-ATPase is the main H⁺-pump active in vacuoles. Conversely, the Spd and Spm effects could be related to somatic embryogenesis regulation driven by these PAs during conditions of energetic stress that was found to involve the H⁺-PPase activation. (Supported by FAPERJ, CNPq, CAPES and FAPESP).