

Compartment specific protection of ascorbate and glutathione during abiotic stress

by Bernd Zechmann

University of Graz, Institute of Plant Sciences, Schubertstrasse 51, 8010 Graz, Austria

Ascorbate and glutathione are important antioxidants and involved in the detoxification of reactive oxygen species, which are commonly formed during environmental stress situations. Changes in ascorbate and glutathione contents are therefore commonly used as stress markers in many fields of plant sciences. Inter- and intracellular ascorbate and glutathione contents and their ratio between certain cell compartments are important measurements of the plants ability to sense and fight oxidative stress and can give key information about the physiological condition of the plant.

Here a method will be presented that allows the quantification of ascorbate and glutathione in all cell compartments simultaneously at a high level of resolution. This method is based on immunogold cytochemistry with anti-ascorbate and anti-glutathione antisera and computer-supported transmission electron microscopy. By applying this method on different *Arabidopsis* mutants during environmental stress situations such as cadmium, light stress and high internal levels of reactive oxygen species it was possible to gain thorough knowledge about the subcellular distribution of ascorbate and glutathione in plants and on the importance of these antioxidants in certain cell compartments during abiotic stress.

