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THE PROTEASOME OF SOLANUM TUBEROSUM EXHIBITS THREE DIFFERENT CATALYTIC FUNCTIONS.

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Proteasomes, cytoplasmic protein particles, ubiquitous from bacteria to man, were isolated by FPLC from potato cell cultures. The particles were incubated at 35° C with the synthetic substrates Z-Gly-Gly-Leu-pNA, Z-Leu-Leu-Glu-BNP and Z-Ala-Arg-Arg-4MBNP containing chromogenic compounds as leaving groups. After 1h the amount of the free dyes was estimated spectrophotometrically. Proteasomes exhibited three different protease activitites: a chymotrypsin-like, a trypsin-like and a peptidylglutamyl-hydrolyzing activity. In all cases the pH-optima were found to be at pH 7.5. The activities were stimulated up to the 4-fold by rise of temperature (55°C) and the peptidyl-glutamyl-hydrolyzing activity also by low concentrations of SDS (0,02%). These findings suggest that proteasomes have to be stimulated by an activator for full activity and that they play an important role in the protein turnover of plant cells.