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Isolated plant cells in the study of metabolism

With isolated cells, microbiological methods can be used in physiological investigations and it is possible to differentiate between processes which occur at a cellular level and those integrated with a whole organ. Biosynthesis and degradation is investigated by labelling protoplasts with compounds which directly reach the plasmalemma. After application of kinetin and ^{14}C -acetate for only 1 hour, a rise of up to 300 % fatty acid activity was observed. With protoplasts we also observed a rapid cAMP uptake by plant cells. Freshly isolated protoplasts have a positive membrane potential which during an approximately 72 hours period became negative again. This transition we also found with *Nicotiana* protoplasts in a salt medium in which only a "pseudo-wall" is formed. When cytokinins are present in the media, the return of a negative potential and new wall formation are more rapid. Protoplasts are also useful in osmoregulation experiments as different species adapt at different rates to the same hyperosmolarity of the medium. One can assume that investigations on cellular resistances with protoplasts are possible.