

Applications of styrylpyridinium dyes in elucidating ion-transport mechanisms in plant cells

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Styrylpyridinium dyes have been used in a range of biological applications, including quantitative electrophysiology and qualitative microscopy for the detection of the membrane electric field strength changes. Examples of these dyes include RH421 and di-4-ASPBS. The aims of our project are to extend the applications of styrylpyridinium dyes and to elucidate ion-transporting mechanisms that take place within algal systems. The dyes RH421, di-4-ASPBS, Annine V, RH414, RH795 and RH237 have been tested on a freshwater photosynthetic system, *Chara corallina* and preliminary measurements have shown that all of these dyes are successfully taken up by the membranes of *Chara* cells. The potential of these molecules to detect ATPase activity is under examination. In addition, we are examining the ability of these molecules to detect the effects of membrane transport inhibitors and protonophores. So far, we have concluded that the styrylpyridinium dye, di-4-ASPBS is the most useful dye for resolving these processes in a freshwater alga cell. These preliminary results are encouraging, as these particular dyes have not previously been applied in photosynthetic systems.