

Dielectric behavior of the flagellate *Euglena gracilis* SM-ZK, a permanent chloroplast-lacking mutant

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SUMMARY

Dielectric analysis is a non-invasive technique that can characterize the passive electrical properties of biological cells including free-living protozoans. This study was undertaken to examine whether dielectric measurements are useful to elucidate electrical properties of chloroplasts in the flagellate *Euglena gracilis* Z (wild type) and SM-ZK (chloroplast-deficient mutant) at frequencies of 100 Hz – 100 MHz. Different dielectric behaviors of wild-type and chloroplast-deficient mutant cells were detected. Dielectric shell-model analysis showed that the broadening of dielectric dispersions could be simulated using a vesicle-inclusion one-shell ellipsoidal model. These results indicate that the dielectric monitoring can detect electrical properties of intracellular organelles in living organisms.