[n this work, we present the characteristics of kha 1 6,. strains in the background of various multiple mutations in genes encoding alkali-metal-cation transporters. Two main phenotype manifestations of the khal deletion were growth defect on high externa\ pH and hygromycin sensitivity. The correlation between these phenotypes and the kha 1 deletion was confirmed by plasmid complementation. Fluorescence microscopy of GFP-tagged Kha 1 p showed that this antiporter is localized preferentially intracellu\arly (in contrast to the plasma-membrane Na+/H+ antiporter Nha 1 p). Based on these findings, Kha 1 p is probably not localized in plasma membrane and do es not mediate efflux of alkali metal cations from cells (as published before in RammÍrez el aJ., 1998), but is important for the regulation of intracelular cation homeostasis and optima\ pH contro l, similarly as the Nhx l p. The khal deletion phenotypes were complemented by heterologous expression of a plant antiporter AtChx 17, showing that the proteins AfChx 17 and SeKhal could have similar t'unction and that S cerevisiae khal deletion mutants could serve for heterologous expression and characterization of some plant transporters in yeast, especially those localized intracellularly.

We also showed that the presence of the Tokl channel strongly infl uences membrane potential: Deletion of the TOKl gene resu\ts in significant plasma membrane depolarization, whereas strains overexpressing the TOKl gene are hyperpolarized.

A decrease in membrane potential is now the second known phenotype (besides the changes in Cs+ tolerance) of the tokl deletion in S cerevisiae cells. We proved that plasma membrane potential is not the only parameter determining the hygromycin B sensitivi ty of yeast cells and that the role ot' intracellular transporters in protecting against its toxic effects must also be considered.