Cite this as: Lu HUANG, Dezhi WU, Guoping ZHANG, 2020. Advances in studies on ion transporters involved in salt tolerance and breeding crop cultivars with high salt tolerance. *Journal of Zhejiang University-Science B (Biomedicine & Biotechnology)*, **21**(6):426-441. http://doi.org/10.1631/jzus.B1900510

Advances in studies on ion transporters involved in salt tolerance and breeding crop cultivars with high salt tolerance

Key words: Salinity, Osmotic stress, Ionic stress, Oxidative stress, Salt tolerance

Research Summary

In this review, recent advances in studies on the mechanisms of salt tolerance in plants are described in relation to the ionome, transcriptome, proteome and metabolome, and the main factors accounting for the differences in salt tolerance among plant species or genotypes within a species is presented. Then we illustrate the application and roles of different breeding methodologies in developing salt-tolerant crop cultivars, and in particular the advantages and prospective of gene editing.

Na^+ accumulation in tissues, especially in shoots, is a major factor affecting salt tolerance, which in turn depends on Na^+ uptake, long-distance transportation and distribution in plants mediated by ion transporters like SOS1, HKT and NHX.

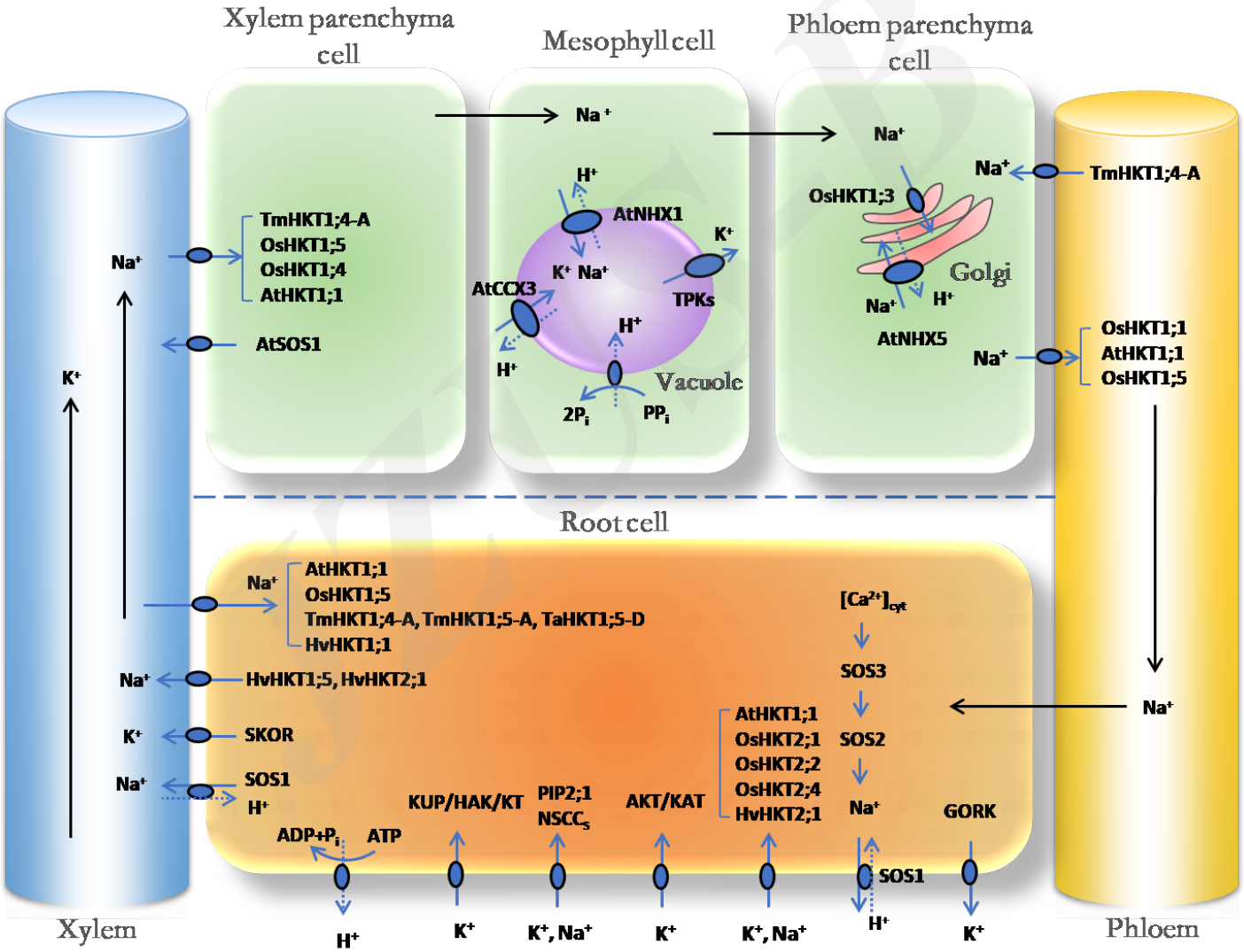

Figure 1

Development of salt-tolerant crop cultivars relies on advanced breeding methodologies, including:

- **molecular marker-assisted breeding**
- **mutagenesis breeding**
- **genetic transformation**
- **genome or gene editing**

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