MATE-type transporters responsible for the vacuolar accumulation of alkaloid in tobacco.

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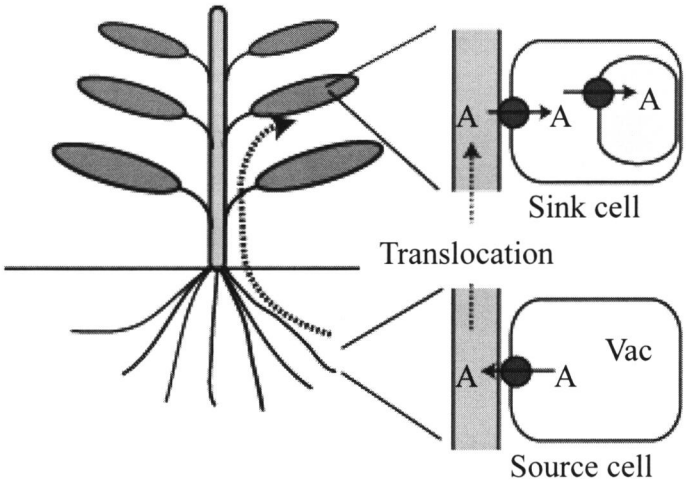
Higher plants produce a large number of secondary metabolites, such as alkaloids, terpenoids, and phenolic compounds. They are often accumulated in particular sink organs, and some are translocated from source cells via long distance transport. The membrane transport of plant secondary metabolites is a newly developing research area. Recent progress in genome sequencing projects.

One of the most well-known examples of long-distance transport is nicotine alkaloids in *Nicotiana* species. Nicotine is biosynthesized in root tissues, where it is specifically increased in the response to attacks by pathogens and herbivores, and the produced nicotine is translocated to the aerial part for accumulation (Figure). As a model system we have been using tobacco plants, and studying the transporter molecules responsible for the membrane transport of nicotine and related alkaloids.



A, alkaloid; V, vacuole; X, xylem

Figure. Scheme of long-distance transport of alkaloids in plants