

Characterization of MATE-type transporter involved in alkaloid transport in *Nicotiana tabacum*

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Alkaloids play a key role in the defense mechanism in plants to protect themselves from pathogens and herbivores. The major alkaloid of the *Nicotiana* species, nicotine, is translocated via xylem transport from the root tissues where it is biosynthesized to the accumulation sites, the vacuoles of leaves. However, its transport mechanism is still largely unknown. Recently, our transcriptome analysis of methyl jasmonate-elicited tobacco BY-2 cells identified four transporter genes (Nt-JAT1, C215, T408, T449) which were highly up-regulated in a coordinate manner with the nicotine biosynthetic genes.¹⁾ Characterization of *Nicotiana tabacum* jasmonate-inducible alkaloid transporter 1 (Nt-JAT1), belonging to the family of multidrug and toxic compound extrusion (MATE) transporters, showed that this protein was expressed in roots, stems, and leaves, and localized in the tonoplast of leaf cells. Biochemical analyses showed that Nt-JAT1 functioned as a nicotine/proton antiporter. Furthermore, we analyzed other MATE-type transporters such as C215. The possible role of these transporters in nicotine translocation is discussed.

1) Morita M et al. (2009) PNAS 106: 2447-2452

