

Functional screening of plant hormone transporters using modified yeast two-hybrid systems with receptor complexes

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Studies have indicated that most plant hormones are mobile. However, it remains largely unknown how the transport of plant hormones is regulated. It has been reported that the receptors of plant hormones such as abscisic acid (ABA), gibberellin (GA) and jasmonoyl isoleucine (JA-Ile) interact with regulatory proteins in the hormone dependent manners. Thus, we used yeast two-hybrid (Y2H) systems with the receptor complexes to look for proteins capable of transporting plant hormones. After screening of proteins that can promote interactions between the ABA receptor PYR/PYL/RCAR and PP2C protein phosphatases under low ABA concentrations, we identified a member of Arabidopsis NRT1/PTR FAMILY (NPF) proteins as an ABA importer. We subsequently found that some other members of NPF could transport ABA, GA and/or JA-Ile. Furthermore, we conducted a screening for GA transporters using the Y2H system with the GA receptor GID1a and the DELLA proteins GAI, and identified potential GA importers that belong to a transporter family other than NPF. We are now analyzing in vivo functions of the potential plant hormone transporters.