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Molecular dissection of a rice salt-induced RING finger protein 3 (*OsSIRP3*) and its potential role in salt stress

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[Introduction]

As sessile organisms, plants always exposed to various abiotic stresses. For these reasons, plants develop their defense mechanisms against to abiotic stresses. Ubiquitin-mediated proteasomal degradation is an important mechanism to control protein for regulation the balance of plants. Here, we describe *Oryza sativa* salt-induced RING finger protein 3 (OsSIRP3), a functional RING E3 ligase that is likely involved in a salt related mechanism. Transcript level of *OsSIRP3* gene highly expressed in whole rice samples, such as root and shoot, after exposed to high salinity stress. In addition, *In vitro* ubiquitination assay demonstrated that OsSIRP3 showed E3 ligase activity by RING H2 domain. Interestingly, we found that the OsSIRP3 interaction with both two salt-induced and non-induced two proteins and then led to protein degradation via ubiquitin (Ub)/26S proteasome-dependent pathway. Overexpression of *OsSIRP3* in Arabidopsis resulted in hypersensitivity for salinity stress during seed germination and root growth. Our finding suggest that OsSIRP3 acts as a negative regulator of salinity stress response by modulating levels of its target proteins.

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