P62

Cloning and characterization of OsNRT genes from rice

Yun-Young Lee, Soon-Jae Jeong, Young-Byung Yi,
Jaesung Nam and Doh-Hoon Kim*

College of Natural Resources and Life Science Dong-A University Busan 604-714, Korea

We isolated the 3 different nitrate genes (OsNRT1-3) from rice (Oryza sativa). The encoded polypeptides are 82% identical to other plants and show high degree of amino acid sequence similarity with nitrate transporter gene of Arabidopsis thaliana, tobacco, soybean and barely. The OsNRT1 and OsNRT2 polypeptides are integral membrane proteins predicted to contain 12 membrane-spanning domains separated into two groups of six by a large charged hydrophilic region. OsNRT1 is 1601-bp long and contains an open reading frame encoding a 533 amino acid polypeptide, whereas OsNRT4 is 1550-bp long and encodes a 516 amino acid polypeptide. The two clones are 71% similar in their nucleotide sequence within the coding region. The two polypeptides are 56% identical in their amino acid sequence. The RNA blot analysis showed that expression of OsNRTs are various in response to nitrate deficiency. In particular expression of OsNRT1 and OsNRT4 were up-regulated in nitrate deficiency condition. However, OsNRT10 constitutively expressed in the both nitrate deficient and nitrate sufficient condition. Now we are generating trangenic rice plant overexpressing each OsNRT1 and OsNRT4 genes.