Volume 47(1-4):79, 2003
Acta Biologica Szegediensis
http://www.sci.u-szeged.hu/ABS

DISSERTATION SUMMARY

Learning to say NO...

Krisztina Ötvös

Institute of Plant Biology, Biological Research Center, Hungarian Academy of Sciences, Szeged, Hungary

Nitric oxide (NO) is the smallest, lightest molecule – and the first gas – known to act as a biological messenger in animals. It is involved in diverse signal transduction pathways controlling smooth muscle tone, responses to infection, apoptosis, cell proliferation as well as fertilization. Recently, the role of nitric oxide in plants has received much attention. It has been alrady demonstrated that plants not only respond to atmospheric NO, but also possess the capacity to produce nitric oxide enzymatically. Initial investigations of NO functions suggested that plants use NO as signaling molecule via pathways remarkably similar to those found in mammals.

Mounting evidences support the hypothesis that NO is a novel effctor of plant growth, development and defense responses. An excellent experimental system to provide further proofs of the involvement of NO in the regulation of plant development is somatic embryogenesis.

In alfalfa, the homogenous population of leaf protoplasts can be induced to form embryogenic cells with reliable synchrony. To find out the role of NO during the reactivation of somatic plant cell protoplasts were cultured in the presence of a NO donor, sodium nitroprusside (SNP) and/or an inhibitor, NG-monomethyl-L-arginine (L-NMMA). Cell morphology and division parameters have been affected by both compounds indicating a role of NO in these processes. Our results suggest, that NO is required for the dedifferentiation process rather than for cell cycle progression and may affect the acquisition of the embryogenic cell fate.

Supervisor: Dénes Dudits
E-mail: okriszta@nucleus.szbk.u-szeged.hu