Salinity and osmotic stress tolerance mediated by a plant natriuretic peptide via cGMP signaling in *Arabidopsis thaliana*

R.M. Bastian, N.N. Ludidi and **C. Gehring**

University of the Western Cape, Department of Biotechnology, Private Bag X17, Bellville, 7535, South Africa.

Plant natriuretic peptides (PNPs) are systemically mobile proteins that regulate homeostasis at nanomolar concentrations. Northern blot studies have revealed that PNPs are up-regulated under osmotic stress and PNP-dependent processes include changes in ion transport and increases in H_2O uptake into protoplasts and whole tissue. We have established that an *Arabidopsis thaliana* PNP (AtPNP-A) stimulates cGMP biosynthesis in *Arabidopsis thaliana* seedlings. We also demonstrate that cGMP levels in *Arabidopsis* seedlings increase rapidly ($\leq$5 s) and to different degrees after salt and osmotic stress, and that the increases are prevented by treatment with LY, an inhibitor of soluble guanylyl cyclases. In addition, we use green fluorescent protein (GFP) to study tissue\cellular localization and expression pattern of AtPNP-A in response to salt and osmotic stress. We also investigate the temporal and spatial expression pattern of the AtPNP-A transcript using the β-glucuronidase (GUS) reporter system in *Arabidopsis thaliana* and *Nicotiana tabacum*. These studies show that AtPNP-A plays a role in cGMP-mediated signaling towards the maintenance of water and salt homeostasis.