

ISOLATION OF NOVEL HORMONE SIGNALLING FACTORS FROM BARLEY GRAIN

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JOURNAL REFERENCE:

1. Woodger FJ, Gubler F, Pogson B and Jacobsen JV. (2003) A Mak-like kinase is a repressor of GAMYB in barley aleurone. *The Plant Journal*, 33: 707-717.

2. Woodger FJ, Jacobsen, JV and Gubler, F. GMPOZ, a BTB/POZ domain nuclear protein, is a regulator of hormone responsive gene expression in barley aleurone. *Plant and Cell Physiology*, 45: 945-950.



Plant and Cell Physiology

The steroid-like hormone gibberellin (GA) is integral to the control of plant development including post-germination events in cereal grain. Previous work in barley had identified a GA-stimulated protein, GAMYB, which activates the hydrolytic genes necessary for the mobilisation of sugar reserves by the developing seedling. The aim of this PhD was to isolate factors which regulate GAMYB function within barley grain.

A novel yeast protein-protein interaction screen, deployed in plant systems for the first time in this project, was used to 'fish out' GAMYB-binding proteins from barley grain. Several proteins likely to play a role in the hormonal regulation of genes were isolated. Two of these, a MAK-subgroup kinase-like gene termed KGM and GMPOZ, a BTB/POZ domain protein, were functionally characterised.

Transient expression assays in barley aleurone showed that KGM is located in the nucleus and cytosol and functions to represses GAMYB activity. This work comprised the first functional description of a member of this kinase subfamily in plants¹. GMPOZ, another GAMYB-binding protein discovered during this PhD, is a member of a family of proteins which include transcriptional regulators that function as scaffolds for chromatin organisation. Using transient silencing of GMPOZ, it was found that GMPOZ, which is nuclear localised, is necessary for transmission of the GA-signal in barley aleurone. Although over 100 members of this family exist in *Arabidopsis*, this was only the third BTB/POZ protein to be described in plants.²

fluorescent barley cell showing where the newly discovered molecules reside