**<This supplementary material is for online publication only>**

**Supplementary materials and methods**

***Bombardment***

Himalaya barley grains were obtained from Jolene Wetterau at Washington State University and stored at 4°C. Embryos were removed with a razor blade and enough embryoless grains for a bombardment experiment (150–300) were placed into a 50-ml tube and incubated in 50 ml of water for 10 min on a rocking incubator. The water was removed and replaced with 50 ml of 10% bleach, and the grains were incubated for 20 min. After removal of the bleach, the grains were rinsed four times for 5 min each in 50 ml of sterile water. The grains were then placed into a sterile glass Petri dish containing vermiculite overlaid with a sheet of filter paper. Enough Imbibing Solution (20 mM sodium succinate, 20 mM calcium chloride, pH 5.0) containing 1 mg ml−1 chloramphenicol was added to the plate to keep the grains moist. The embryoless grains were incubated at 24°C for 2 d. The seed coat was then gently removed from each grain using fine forceps, and the grains were incubated for an additional 16–20 h at 24°C.
 For each treatment, 2.5 μg of *UBI::Luciferase*, 2.5 μg of reporter construct, and in some cases 2.5 μg of one or more effector constructs were combined in a microcentrifuge tube. For all treatments, a total of 10 μg of plasmid was prepared in a volume of 5 μl. To each plasmid mixture, 50 μl of a suspension of BioRad 1.6 μm gold microcarriers (60 mg ml−1, prepared according to the manufacturer’s instructions) was added. After vortexing quickly, 50 μl of 2.5 M CaCl2 was added and the suspension was again briefly vortexed. Twenty microlitres of 0.1 M spermidine was then added and the suspension was vortexed for 2 min. The gold microcarriers were allowed to settle for 1 min, and were centrifuged for 2 s. The liquid was discarded and 140 μl of 70% ethanol was added. This liquid was then discarded and 140 μl of 100% ethanol was added. This liquid was discarded and 48 μl of 100% ethanol was added. The microcarriers were then well suspended in the ethanol and 8-μl aliquots were spread on to macrocarriers and allowed to dry.
 For bombardments, eight embryoless grains were arranged in a radial pattern on filter paper, and placed in the chamber of a BioRad PDS-1000/He Particle Delivery System, at a distance of 6 cm from the stopping screen. The distance between the rupture disc retaining cap and the macrocarrier cover lid was set at the standard distance (6 mm), and the stopping screen support was placed at the (standard) middle position, allowing a macrocarrier travel distance of 11 mm. The chamber was evacuated to 28 inch Hg, and bombardments were carried out using either 1350 psi or 1550 psi rupture discs. Typically, four shots (resulting in eight samples) were carried out for each treatment. The bombarded grains were placed, in groups of four, into 60-mm Petri dishes with 4 ml of Imbibing Solution containing 1 mg ml−1 of chloramphenicol and an appropriate concentration of GA or ABA. After incubation at 24°C for (typically) 24 h, each sample (four seeds) was ground in a chilled mortar and pestle in 800 μl of Grinding Buffer (100 mM sodium phosphate pH 7.2, 5 mM DTT, 10 μg ml−1 leupeptin, 20% glycerol). The grain extracts were centrifuged at 16,000 × *g* at 4°C for 10 min and the supernatants were decanted into fresh tubes and stored on ice.

 For luciferase assays, 100 μl of cleared extract was added to 200 μl of assay mixture (45 mM Tris sulphate pH 7.7, 15 mM MgCl2, 20 mM DTT, 1.5 mM EDTA, 1 mM luciferin, 1 mM ATP) and vortexed for 2 s. The mixture was then immediately placed into a single tube flash luminometer to record the light output. For GUS assays, 50 μl of cleared extract was added to 200 μl of GUS Assay Buffer (50 mM sodium phosphate pH 7.2, 2.5 mM 4-methylumbelliferyl-β-d-glucuronide, 10 mM DTT, 2 mM EDTA, 10 μg ml−1 leupeptin, 20% methanol, 0.02% sodium azide) and incubated at 37°C in the dark for 20 h. The samples were then centrifuged at 16,000 × *g* for 5 min, and 6.25 μl of each resulting supernatant was added to 250 μl of 0.2 M Na2CO3 in a well of a black 96-well microtitre plate. The fluorescence of methylumbelliferone (excitation = 360 nm, emission = 460 nm) was determined using a microplate fluorescence reader. The sensitivity of the instrument was set such that 6.25 μl of 40 μM methylumbelliferone added to 250 μl of 0.2 M Na2CO3 would result in a reading of 1000 fluorescence units. The GUS value for each sample was normalized by dividing by the corresponding luciferase value. Any samples with lower than 20,000 relative luminescence units s-1 were excluded from consideration. Normalized expression from reporter genes was reported relative to the level of expression in the absence of hormones or effector constructs.