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On the Cover: Increasing phosphate uptake by plant roots as well as its transport to the shoot are critical for maximising plant growth with less fertiliser input. At the molecular level, these processes are controlled by a number of negative regulators, including the E2 ubiquitin conjugase PHO2 (PHOSPHATE2) and inhibitors of MYB transcription factor PHR1 (PHOSPHATE STARVATION RESPONSE1) such as SPX1 (SPX DOMAIN GENE 1) and SPX2. These regulators act not only on phosphate transport, but also on plant development and general stress acclimation. Their removal dramatically increases shoot accumulation of phosphate, but knock-out plants often grow poorly or are more sensitive to abiotic stress. In the July issue 174(3), Linn et al. (pp. 1969–1989) used a bioinformatics approach to identify root-cell enriched genes that are either induced by low phosphate stress or that are predicted to interact with a PSI (phosphate-starvation induced) gene product in a root-cell specific manner. The final selection of eleven candidate genes revealed that an unknown WD40 repeat-containing protein, WDD1 (WD40-DOMAIN1), and the abiotic stress responsive calcium sensor CBL1 (CALCINEURIN B-LIKE PROTEIN1) are strong negative regulators of the phosphate starvation response. The image shows that knock-out of either *CBL1* or *WDD1* not only resulted in moderate accumulation of phosphate in shoots, but also significantly improved root and shoot growth in P-limited seedlings (represented by radar plots and root images). Knock-out mutants for both genes showed mis-regulation of PHR1-dependent PSI genes (represented by heat map). *WDD1* is co-expressed with its predicted interactor PHT1;2 (PHOSPHATE TRANSPORTER1;2) in the root epidermis and endodermis, while *CBL1* is expressed in all root cell types with strong expression in the root vasculature (shown here) with increased expression in P-limited roots. Image by Oliver Berkowitz.

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