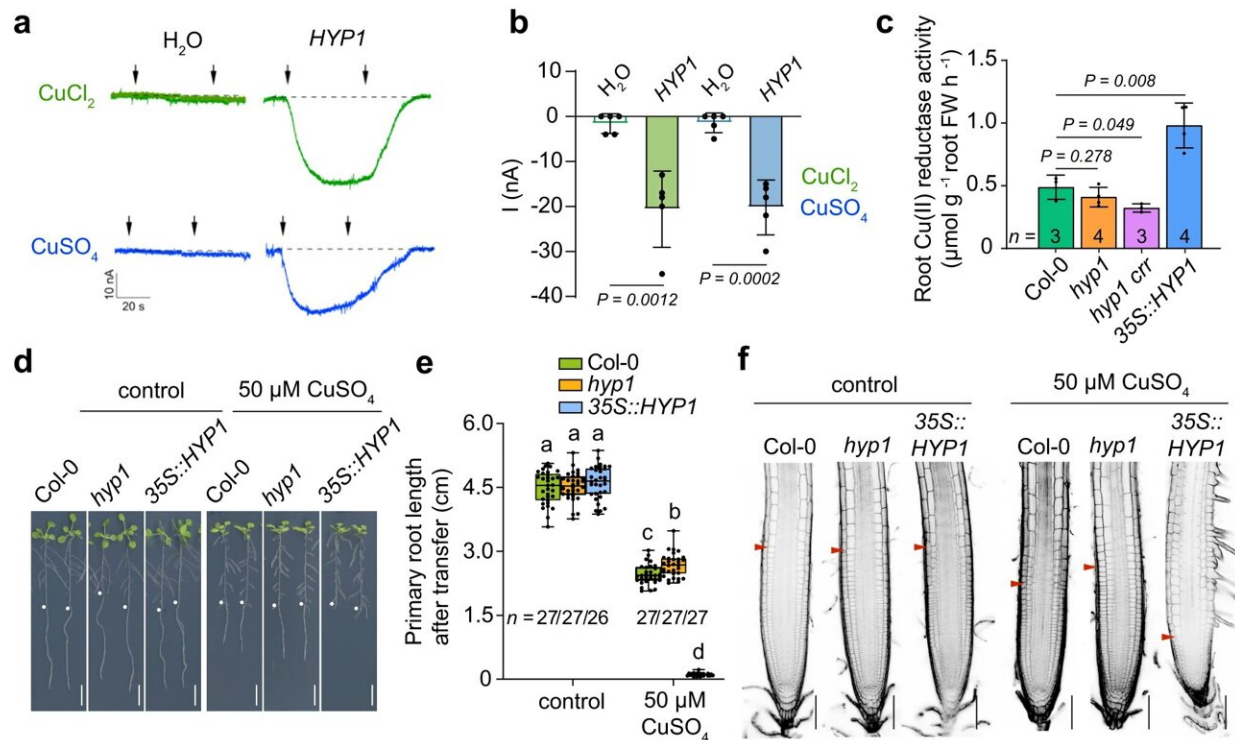


# A new type of plant metalloreductase maintains root growth under low phosphorus

January 11 2024



HYP1 can mediate cupric reduction activity and alter Cu sensitivity of roots. **a**, **b** Trans-plasma membrane current recordings (**a**) and calculated mean currents (**b**) in *X. laevis* oocytes injected with water ( $\text{H}_2\text{O}$ ) or cRNA of *HYP1* (*HYP1*) in response to two sources of Cu(II) ( $\text{CuSO}_4$  and  $\text{CuCl}_2$ ) in standard bathing solution (pH 5.5), at a holding potential of  $-20$  mV. The left and right arrows indicate the addition and removal of the Cu substrates, respectively. Bars represent means  $\pm$  SD ( $n = 5$  independent oocytes).  $P$  values according to two-sided Student's  $t$ -test. **c** Cu(II) reductase activity of wild-type (Col-0), *hyp1*, *hyp1 crr* and one transgenic line overexpressing *HYP1* (35S::*HYP1*). Ten-day-old seedlings grown on standard half-strength MS medium were used for the assay.

Bars represent means  $\pm$  SD ( $n$  = biological replicates constituted of 6 plants each as indicated in the plot).  $P$ -values according to two-sided Student's  $t$ -test. **d–f** *HYP1* overexpression increases the sensitivity of primary roots to high Cu concentrations. Appearance of plants (**a**), primary root length ( $n$  = independent roots as indicated in the plot) (**b**) and root tip morphology (**c**). Ten-day-old seedlings were transferred to fresh medium containing 0.05  $\mu$ M (control) or 50  $\mu$ M  $\text{CuSO}_4$  and analyzed after 6 days. For the box plots, horizontal line, median; edges of boxes, 25th (bottom) and 75th (top) percentiles; whiskers, minimum and maximum values; and dots, individual biological replicates. Different letters indicate significant differences (one-way ANOVA followed by post-hoc Tukey's test,  $P$

Citation: A new type of plant metalloredutase maintains root growth under low phosphorus (2024, January 11) retrieved 28 April 2024 from <https://phys.org/news/2024-01-metalloredutase-root-growth-phosphorus.html>

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