



Corrigendum: The Arabidopsis ATP-BINDING CASSETTE Transporter ABCB21 Regulates Auxin Levels in Cotyledons, the Root Pericycle, and Leaves

Mark K. Jenness¹, Nicola Carraro², Candace A. Pritchard¹ and Angus S. Murphy^{1,2*}

¹ Department of Plant Science and Landscape Architecture, University of Maryland, College Park, MD, United States,

² Department of Horticulture and Landscape Architecture, Purdue University, West Lafayette, IN, United States

Keywords: ABCB transporter, Arabidopsis thaliana, auxin, development, seedling

A Corrigendum on

The Arabidopsis ATP-BINDING CASSETTE Transporter ABCB21 Regulates Auxin Levels in Cotyledons, the Root Pericycle, and Leaves

by Jenness, M. K., Carraro, N., Pritchard, C. A., and Murphy, A. S. (2019). *Front. Plant Sci.* 10:806. doi: 10.3389/fpls.2019.00806

OPEN ACCESS

Edited and reviewed by:

Markus Geisler,
Université de Fribourg, Switzerland

*Correspondence:

Angus S. Murphy
asmurphy@umd.edu

Specialty section:

This article was submitted to
Plant Traffic and Transport,
a section of the journal
Frontiers in Plant Science

Received: 19 February 2020

Accepted: 10 March 2020

Published: 09 April 2020

Citation:

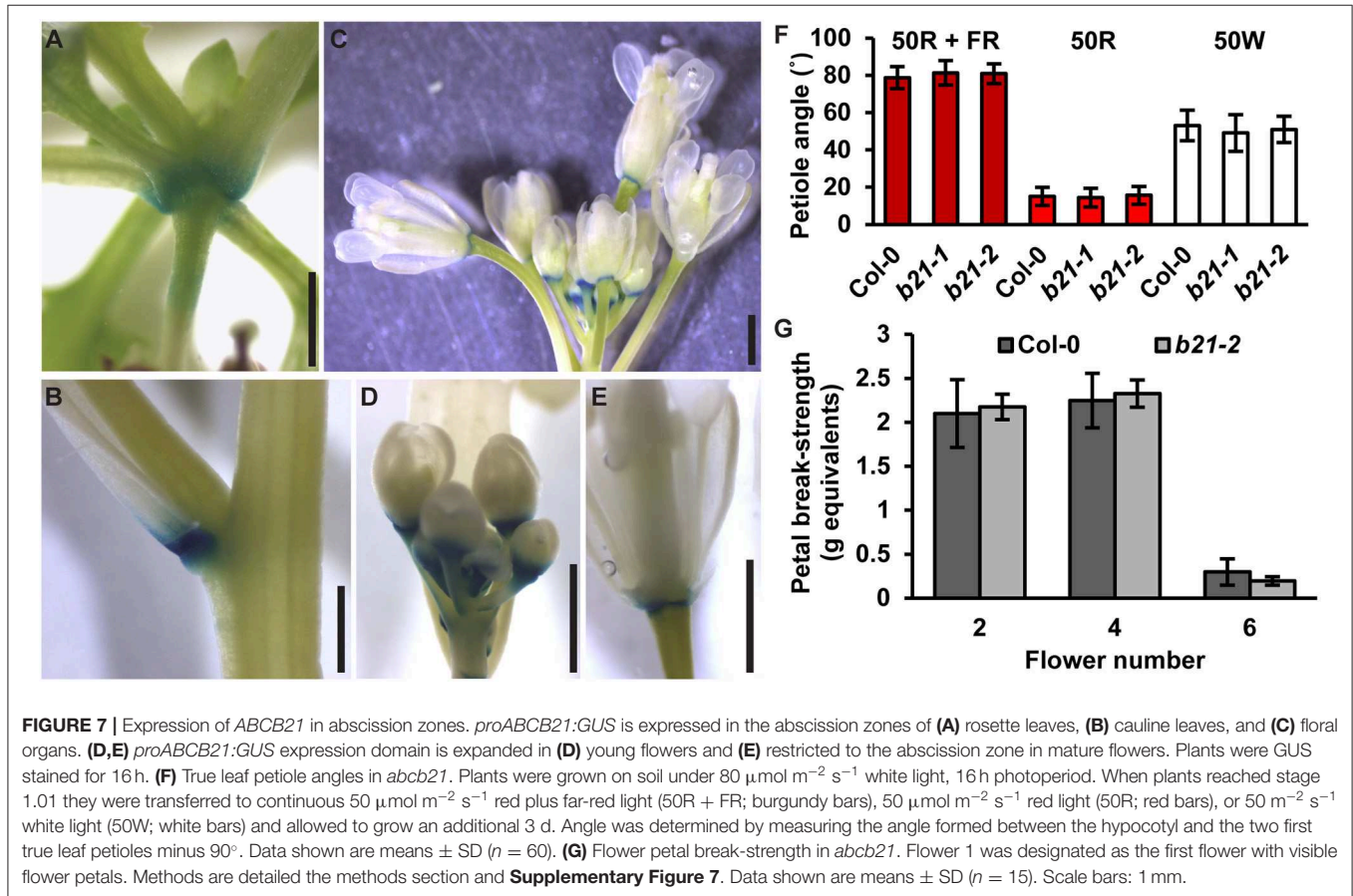
Jenness MK, Carraro N, Pritchard CA
and Murphy AS (2020) Corrigendum:
The Arabidopsis ATP-BINDING
CASSETTE Transporter ABCB21
Regulates Auxin Levels in Cotyledons,
the Root Pericycle, and Leaves.
Front. Plant Sci. 11:351.
doi: 10.3389/fpls.2020.00351

In the original article, there was a mistake in **Figure 7F** as published. The red light source used was subsequently found to emit a small amount of far-red. The experiments were repeated with a light setup that eliminated all far-red spectra. Under these conditions, *abcb21* mutants were still not different from Col-0. A correction has been made to **Figure 7**, its legend and the Results section. The Results section, subsection *ABCB21* Expression Is Rapidly Induced During Wounding:

“As reported previously (Kamimoto et al., 2012), *proABCB21:GUS* expression in late stage mature tissues is restricted to the abscission zones of flowers, as well as rosette and cauline leaves (**Figures 7A–E**). Auxin regulation of leaf positioning (Peeters et al., 2009; de Carbonnel et al., 2010) and floral organ shedding/abscission (Tang et al., 2013) suggests a possible role for ABCB21 in regulation of localized auxin accumulations in these tissues. However, no differences in light-mediated leaf positioning were observed in *abcb21* mutants when responses under continuous 50 $\mu\text{mol m}^{-2} \text{s}^{-1}$ red plus far red light, 50 $\mu\text{mol m}^{-2} \text{s}^{-1}$ red light, or 50 $\mu\text{mol m}^{-2} \text{s}^{-1}$ white light were examined (**Figure 7F**), and measurements of petal break-strength was not different between Col-0 and *abcb21-2* (**Figure 7G**). It is unclear whether *ABCB21* expression at these junction sites is responsive or causal. However, wounding increases *ABCB21* expression $\sim 1.7\text{X}$ between 30 and 60 min before returning to pre-wound levels or below (Kilian et al., 2007). Rapid induction of *proABCB21:GUS* expression is observed in stem tissues after wounding (**Figure 8A**). No GUS staining was observed in Col-0 indicating staining was not due to non-specific enzymatic activity. However, similar discrete *DR5:GUS* signals are initially observed in both Col-0 and *abcb21-2* suggesting initial auxin accumulations are not affected (**Figure 8B**). A downstream role in wound-induced vascularization is possible, but does not appear to involve monolignol transport, as is observed with *ABCG29* (Alejandro et al., 2012). No differences in seedling root growth on *p*-coumaryl alcohol were observed in *abcb21* under conditions where *abcg29* root growth is more inhibited than Col-0 (**Supplementary Table 1**), and no differences in lignin content or speciation were detected in

seedling roots (**Supplementary Table 2**). A more localized impact on auxin-dependent vascularization is possible, but could not be reproducibly verified.”

The authors apologize for this error and state that this does not change the scientific conclusions of the article in any way. The original article has been updated.



REFERENCES

- Alejandro, S., Lee, Y., Tohge, T., Sudre, D., Osorio, S., Park, J., et al. (2012). AtABCG29 is a monoglucosyltransferase involved in lignin biosynthesis. *Curr. Biol.* 22, 1207–1212. doi: 10.1016/j.cub.2012.04.064
- de Carbonnel, M., Davis, P., Roelfsema, M. R. G., Inoue, S.-I., Schepens, I., Lariguet, P., et al. (2010). The Arabidopsis PHYTOCHROME KINASE SUBSTRATE2 protein is a phototropin signaling element that regulates leaf flattening and leaf positioning. *Plant Physiol.* 152, 1391–1405. doi: 10.1104/pp.109.150441
- Kamimoto, Y., Terasaka, K., Hamamoto, M., Takanashi, K., Fukuda, S., Shitan, N., et al. (2012). Arabidopsis ABCB21 is a facultative auxin importer/exporter regulated by cytoplasmic auxin concentration. *Plant Cell Physiol.* 53, 2090–2100. doi: 10.1093/pcp/pcs149
- Kilian, J., Whitehead, D., Horak, J., Wanke, D., Weinl, S., Batistic, O., et al. (2007). The AtGenExpress global stress expression data set: protocols, evaluation and model data analysis of UV-B light, drought and cold stress responses. *Plant J.* 50, 347–363. doi: 10.1111/j.1365-313X.2007.03052.x
- Peeters, A. J., van Zanten, M., Millenaar, F. F., Voesenek, L. A., Pierik, R., and Cox, M. C. (2009). Differential petiole growth in *Arabidopsis thaliana*: photocontrol and hormonal regulation. *New Phytol.* 184, 141–152. doi: 10.1111/j.1469-8137.2009.02921.x
- Tang, S., Shahid, A. A., González-Carranza, Z. H., Roberts, J. A., Basu, M. M., and Azam-Ali, S. (2013). The manipulation of auxin in the abscission zone cells of Arabidopsis flowers reveals that indoleacetic acid signaling is a prerequisite for organ shedding. *Plant Physiol.* 162, 96–106. doi: 10.1104/pp.113.2.16234

Copyright © 2020 Jenness, Carraro, Pritchard and Murphy. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.