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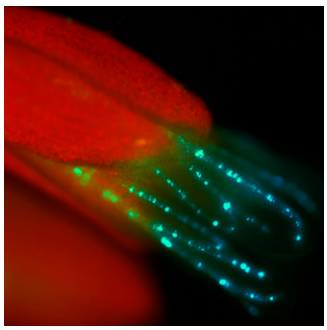
ON THE COVER



Sieve tubes are the functional units for long-distance transport and signaling in the phloem. The tube architecture defines frictional interactions with the fluid, so sieve tube structure has a direct impact on translocation. There has been debate about the in vivo structure of sieve elements and the pressure flow hypothesis for many decades; in particular, the shape and location of P proteins remained unresolved. Froelich et al. (pages 4428–4445) present in vivo observations of transgenic *Arabidopsis thaliana* plants carrying P proteins from the Sieve-Element-Occlusion-Related (SEOR) family, tagged with yellow fluorescent protein. New protocols for transmission electron microscopy reveal the in vivo ultrastructure of sieve tubes. The authors show that massive protein agglomerations in the flow path are common but do not impede translocation, and implications for understanding phloem translocation are discussed. The cover shows an epifluorescence micrograph of an *Arabidopsis* flower. Yellow fluorescent protein–tagged SEOR proteins outline the phloem files in the petals (green/blue).

IN BRIEF

LETTERS TO THE EDITOR

PERSPECTIVE

LARGE-SCALE BIOLOGY ARTICLES

RESEARCH ARTICLES

CORRECTIONS

C Some figures in this article are displayed in color online but in black and white in the print edition.

W Online version contains Web-only data.

OA Open Access articles can be viewed online without a subscription.

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