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2009 : December 2009 - Fast Breaking Papers : Angus Murphy Discusses Research on Arabidopsis

## FAST BREAKING PAPERS - 2009

December 2009



**Angus S. Murphy talks with *ScienceWatch.com* and answers a few questions about this month's Fast Breaking Paper in the field of Plant & Animal Science.**



**Article Title: ABCB19/PGP19 stabilises PIN1 in membrane microdomains in Arabidopsis**

Authors: Titapiwatanakun, B;Blakeslee, JJ;Bandyopadhyay, A;Yang, H;Mravec, J;Sauer, M;Cheng, Y;Adamec, J;Nagashima, A;Geisler, M;Sakai, T;Friml, J;Peer, WA;**Murphy, AS**

Journal: PLANT J, Volume: 57, Issue: 1, Page: 27-44, Year: JAN 2009

\* Purdue Univ, Dept Hort, W Lafayette, IN 47907 USA.

\* Purdue Univ, Dept Hort, W Lafayette, IN 47907 USA.

\* Univ Ghent, Dept Plant Syst Biol, B-9052 Ghent, Belgium.

\* Purdue Discovery Pk, W Lafayette, IN 47907 USA.

(addresses have been truncated)

**SW: Why do you think your paper is highly cited? Does it describe a new discovery, methodology, or synthesis of knowledge?**

I believe that one of the key reasons why this paper is being cited is because it describes the interactions between two hormone transport systems and provides a rationale for ABCB function in auxin transport. It is a new discovery. The article is also cited because of the methods used to solubilize ABCB proteins from detergent resistant membranes using beta methyl cyclodextrin.

**SW: Would you summarize the significance of your paper in layman's terms?**

The paper describes interactions between the coordinated, but independent, ABCB and PIN auxin transport mechanisms. The paper also identifies lipid ordered membrane domains as probable sites of interaction between these two systems. The work also suggests that ABCB19 and other ABCB transporters may contribute to the ordering of these membrane domains.

**SW: How did you become involved in this research, and were there any problems along the way?**

This paper is an end product of 12 years of research that began with the identification of ABCB transporters as potential components of auxin transport complexes. The work specifically addresses a previous paper (Bosl Noh *et al.*, 2003), where we misinterpreted results indicating that PIN1 was destabilized in detergent-solubilized membranes as evidence of PIN1 mislocalization in *Arabidopsis* hypocotyls. This paper is consistent with other evidence that PIN1 recruitment into ordered membrane domains may regulate its activity.

*"This work has already led us to new discoveries regarding the regulation of transport complexes by ordered membrane domains..."*

**SW: Where do you see your research leading in the future?**

This work has already led us to new discoveries regarding the regulation of transport complexes by ordered membrane domains, the function of ABCB transporters in plant growth, and the function of ABCB transporters in excluding auxin from the plasma membrane.

**SW: Do you foresee any social or political implications for your research?**

Apart from the implication for improving food supplies and bioenergy sources—no.

**Angus Murphy, Ph.D.**

**Professor**

**Department of Horticulture**

**Purdue University**

**West Lafayette, IN, USA**

**Web**

KEYWORDS: DETERGENT-RESISTANT MEMBRANES; POLAR-AUXIN-TRANSPORT; METHYL-BETA-CYCLODEXTRIN; P-GLYCOPROTEIN ACTIVITY; GNOM ARF-GEF; LIPID RAFTS; MULTIDRUG-RESISTANCE; PLASMA-MEMBRANE; PLANT-CELLS; EFFLUX CARRIER.

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