

## НОВОСТИ БИОЛОГИИ РАСТЕНИЙ, Август 2018

### **New process in root development discovered**

Scientists uncover communication at the root tip.

[https://www.eurekalert.org/pub\\_releases/2018-07/iosa-npi072618.php](https://www.eurekalert.org/pub_releases/2018-07/iosa-npi072618.php)

### **Plant mothers talk to their embryos via the hormone auxin**

Scientists solve long-standing question about signal that regulates embryo development.

[https://www.eurekalert.org/pub\\_releases/2018-07/iosa-pmt071318.php](https://www.eurekalert.org/pub_releases/2018-07/iosa-pmt071318.php)

### **New receptor involved in symbiosis between legumes and nitrogen-fixing rhizobia identified**

Identifying receptors important for Nod-factor signaling could provide a basis for new biotechnological targets in non-symbiotic crops, to improve their growth in nutrient-poor conditions.

[https://www.eurekalert.org/pub\\_releases/2018-07/au-nri070418.php](https://www.eurekalert.org/pub_releases/2018-07/au-nri070418.php)

### **Particulate matter increases drought vulnerability of trees**

Particulate matter deposits on leaves increase plant transpiration and the risk of plants suffering from drought. Particulate matter could thus be contributing more strongly to tree mortality and forest decline than previously assumed. This is suggested by results from a greenhouse study, in which tree seedlings grown in almost particulate matter free air or in unfiltered air were compared.

<https://www.sciencedaily.com/releases/2018/07/180716103538.htm>

### **Minimum requirements for changing and maintaining endodermis cell identity in the *Arabidopsis* root**

The *Arabidopsis* root endodermis is a tractable model to address how transcription factors contribute to differentiation. Results demonstrate that other root cell types can be forced to differentiate into the endodermis and highlight a previously unappreciated role for receptor kinase signalling in maintaining endodermis identity.

<https://www.nature.com/articles/s41477-018-0213-y>

### **Fern's sequenced genome holds environmental promise**

A tiny fern -- with each leaf the size of a gnat -- may provide global impact for sinking atmospheric carbon dioxide, fixing nitrogen in agriculture and shooing pesky insects from crops. The fern's full genome has now been sequenced.

<https://www.sciencedaily.com/releases/2018/07/180711122335.htm>

### **Constrained expansion**

Using leaf trichomes as a model, Dan Szymanski of Purdue University, Indiana, and colleagues have shown that the polarised growth of these cells is achieved by the indirect interaction of both the microfilamental and microtubular cytoskeleton.

<https://www.nature.com/articles/s41477-018-0229-3>

### **The Integration of Electrical Signals Originating in the Root of Vascular Plants**

This review deals with aspects of sensory input in plant roots and the propagation of discrete signals to the plant body.

<https://www.frontiersin.org/articles/10.3389/fpls.2017.02173/full>

### **Phloem physics: mechanisms, constraints, and perspectives**

This paper provides an overview of recent research and perspectives on phloem biomechanics and the physical constraints relevant to sugar transport in plants.

<https://www.sciencedirect.com/science/article/pii/S1369526617302066?via%3Dihub>

### **A Pivotal Role of Cell Wall in Cadmium Accumulation in the Crassulaceae hyperaccumulator *Sedum plumbizincicola***

In this study, *Sedum plumbizincicola*, a Crassulaceae hyperaccumulator recently identified specifically in China, was subjected to a genome-scale comparative study. Our results not only revealed common mechanisms conserved in a wide range of hyperaccumulating plants but also discovered that cell wall plays a pivotal role in this specific hyperaccumulator.

[https://www.cell.com/molecular-plant/fulltext/S1674-2052\(16\)30307-0](https://www.cell.com/molecular-plant/fulltext/S1674-2052(16)30307-0)

### **Defence signalling marker gene responses to hormonal elicitation differ between roots and shoots**

These findings suggest that marker gene responses can be organ and species specific and should be interpreted with caution. It is therefore advisable to combine analyses of multiple marker genes with those of phytohormone levels to ascertain more certainly which hormonally regulated defence pathways are activated.

<https://www.botany.one/2018/07/defence-signalling-marker-gene-responses-to-hormonal-elicitation-differences-between-roots-and-shoots/>

### **Plant carbon metabolism and climate change: elevated CO<sub>2</sub> and temperature impacts on photosynthesis, photorespiration and respiration**

Here we review how photosynthesis, photorespiration and respiration are affected by increasing atmospheric CO<sub>2</sub> concentrations and climate warming, both separately and in combination.

<https://nph.onlinelibrary.wiley.com/doi/full/10.1111/nph.15283>

### **Associations between shoot-level water relations and photosynthetic responses to water and light in 12 moss species**

The study investigated the water relations (water holding and retention capacities), photosynthetic water- and light-response curves of shoots of 12 moss species, and explored the associations between these traits and their distributions among the studied species.

<https://www.botany.one/2018/07/associations-between-shoot-level-water-relations-and-photosynthetic-responses-to-water-and-light-in-12-moss-species/>

### **The molecular basis of glandular trichome development and secondary metabolism in plants**

This article introduced the classification, morphology, distribution and biological roles of glandular trichome, also expounded the molecular mechanism of glandular trichome occurrence and development as well as glandular trichome secondary metabolism.

<https://www.sciencedirect.com/science/article/pii/S2352407317300276>

### **Abscisic acid affects rice cell wall phosphate remobilization and P transpiration**

Scientists investigate the mechanism underlying ABA-aggravated P deficiency in rice (*Oryza sativa*).

<https://www.botany.one/2018/07/abscisic-acid-affects-rice-cell-wall-phosphate-remobilization-and-p-transpiration/>

### **Rice plants evolve to adapt to flooding**

Although water is essential for plant growth, excessive amounts can waterlog and kill a plant. In South and Southeast Asia, where periodic flooding occurs during the rainy season, the water depth can reach several meters for many months.

<https://www.sciencedaily.com/releases/2018/07/180712141631.htm>

### **Algae have land genes**

Hedrich's team now wants to harness the decoded *Chara braunii* genome to study which ion channels in the algae are responsible for the action potentials.

[https://www.eurekalert.org/pub\\_releases/2018-07/uow-ahl071218.php](https://www.eurekalert.org/pub_releases/2018-07/uow-ahl071218.php)

### **Plant defense mechanisms**

Plants are able to muster a kind of reserve defense system against different kinds of attacks

[https://www.eurekalert.org/pub\\_releases/2018-07/nuos-pdm071918.php](https://www.eurekalert.org/pub_releases/2018-07/nuos-pdm071918.php)

### **Models and Mechanisms of Stomatal Mechanics**

These investigations are providing a new understanding of the mechanism of stomatal mechanics.

<https://www.sciencedirect.com/science/article/pii/S1360138518301328>

Составила: Жуковская Н.В.