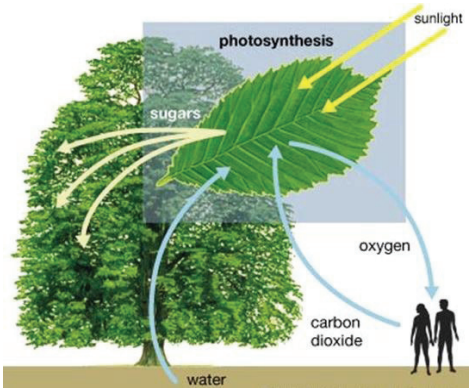
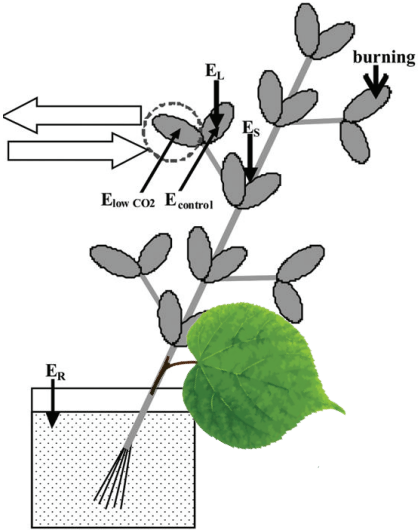
Research (What is it about?)	**Electrical regulation of photosynthesis in plants**
UNN authors	*Sukhov V., Surova L., Sherstneva O., Vodeneev V.*
We find (The result)	The effects of electrical signals on photosynthesis, the mechanisms of the effects, and its physiological role in plants were investigated
Abstract	Local irritations of plants induce various photosynthetic responses in intact leaves, including fast and long-term inactivation of photosynthesis, and its activation. Irritation-induced electrical signals, including action potential, variation potential, and system potential, causes the photosynthetic responses in intact leaves. An induction of fast inactivation of photosynthesis is associated with Ca^{2+}- and (or) H^+-influxes during electrical signals generation; long-term inactivation of photosynthesis might be caused by Ca^{2+}- and (or) H^+-influxes, production of abscisic and jasmonic acids, and inactivation of phloem H^+-sucrose symporters. Subsequent development of inactivation of photosynthesis is mainly associated with decreased CO_2 influx and inactivation of the photosynthetic dark reactions. The ultimate effect of electrical signals induced photosynthetic responses in plant life is the increased photosynthetic machinery resistance to stressors, including high and low temperatures, and enhanced whole-plant resistance to environmental factors at least during 1 h after irritation.

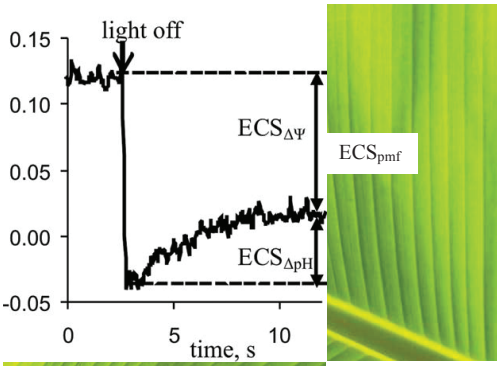
Representative articles 2016-2017, quartiles	1. *Sukhov V., Surova L., Morozova E., Sherstneva O., Vodeneev V.* Changes in H+-ATP synthase activity, proton electrochemical gradient, and pH in pea chloroplast can be connected with variation potential. Front. Plant Sci. **7**:1092 (2016).	Q1
	2. *Sukhov V.* Electrical signals as mechanism of photosynthesis regulation in plants. Photosyn. Res. **130**(1-3), 373-387 (2016).	Q1
	3. *Surova L., Sherstneva O., Vodeneev V., Katicheva L., Semina M., Sukhov V.* Variation potential-induced photosynthetic and respiratory changes increase ATP content in pea leaves. J. Plant Physiol. **202**, 57-64 (2016).	Q1
	Q-index (Qi) of the result	**4**

In collaboration	Russian Acad Sci, Razuvaev Inst Organometall Chem, Ul Tropinina 49, Nizhnii Novgorod 603137, Russia Nizhny Novgorod State Med Acad, Nizhnii Novgorod, Russia



Positions of burning (flame, 3–4s, ≈1 cm^2) and electrical potential monitoring: E_L and E_S, AgC/AgCl electrodes connected to the leaf and stem, E_R, reference electrode.





Kinetics of differences between light absorption at 515 nm and absorption at 550nm, ECS_{pmf}, $ECS\Delta\psi$, and $ECS_{\Delta pH}$ represent electrochromic pigment absorbance shifts proportional to the proton motive force, transmembrane electrical potential, and proton gradient on the thylakoid membrane, respectively

Changes in the surface electrical potential of the stem near the second leaf (E_S) and at the center of its leaflet (E_L), as induced by the burning of the first leaf