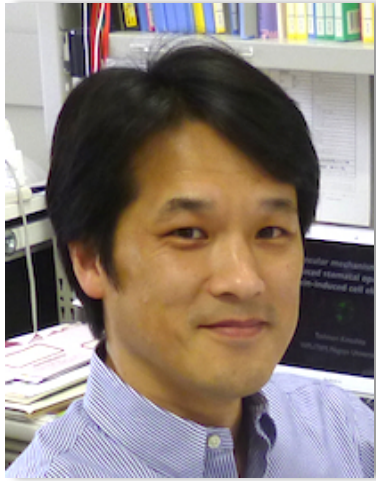


- Technology Presentation #1 -

“Control of stomatal aperture by genetic and chemical approaches”



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Abstract:

Stomata in the plant epidermis control gas exchange between plants and atmosphere. Stomatal aperture is regulated by many environmental signals, such as light, water status, temperature, and CO₂. Under blue light, plasma membrane (PM) H⁺-ATPase in stomatal guard cells is activated via blue light-receptor phototropins and signaling mediators, such as BLUS1, BHP, and PP1. Blue light-activated PM H⁺-ATPase provides driving force for stomatal opening. However, details of the signaling between phototropins and PM H⁺-ATPase still remain unclear. Therefore, we are trying to clarify this signaling pathway by several methods. In addition, based on the results from these basic researches, we are trying to control stomatal aperture by genetic and chemical approaches, and found that enhancement of light-induced stomatal opening by overexpressing PM H⁺-ATPase in guard cells increases photosynthesis and plant growth, and that suppression of stomatal opening by chemicals confers drought tolerance on plants. These results clearly indicate that manipulation of stomatal aperture is very useful technique for controlling plant growth and survive. In this talk, I will present the recent our progress and discuss potential of these approaches.

Biography:

2013-present	Professor, Institute of Transformative Bio-Molecules (ITbM), Nagoya University
2013-present	Director, Center for Gene Research, Nagoya University
2010-present	Professor, Graduate School of Science, Nagoya University
2007-2010	Associate Professor, Nagoya University
2005-2009	PRESTO Researcher, Japan Science and Technology Agency
2003-2004	Visiting Scientist, Salk Institute (Prof. Joanne Chory)
1999-2007	Assistant Professor, Kyushu University
1994-1999	Research Associate, Kyushu University

- Technology Presentation #1 - (continued)

Publications (selected):

Toh et al. (2018) Plant Cell Physiol, in press.

Hayashi et al. (2017) Sci Rep, 7, 45586.

Wang et al. (2014) PNAS, 111, 533-538.

Kinoshita et al. (2011) Curr Biol, 21, 1232-1238.

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