Book review

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Z. Yang (ed): Intracellular Signaling in Plants, volume 33 (of the Annual Plant Reviews)

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The mechanisms regulating intracellular signalling in plants are being investigated for several years. Higher plants are not able to move or migrate. Although exhibiting such immobile behaviour plants perceive changes in the environment, and respond to various signals. The volume “Intracellular signalling in plants” characterises most of the elements of cellular signalling pathways existing in plant cells.

Signals are first sensed by a receptor. Chapter 1 written by Keiko Torii summarises our knowledge on receptor-like kinases and their ligands. Chapter 2 describes one of the key signalling elements in eucaryotes—heterotrimeric G proteins. Its function in phytohormone signalling, sugar sensing and reaction to biotic and abiotic stresses is presented. After signal perception, it needs to be transmitted to the nucleus by a complex network. Protein kinase cascades, predominantly mitogen-activated protein kinases which sequentially phosphorylate and activate a series of proteins, are the heroes of Chapter 4 by Shugun Zhang. Calcium ions are recognised as ubiquitous cellular regulator and changes in cytosolic calcium concentration are known to act as second messenger. Calcium signature and calcium

switches, as well as function of calcium sensors (CaM, CBL) are the topics of two next chapters. Oxidative stress seems to be induced by many biotic and abiotic stresses. Miller et al. gave us an overview of the ROS network in plants and discuss its complexity. Lipids are not only components of biomembranes, but also they modulate protein structure and function and by dynamic flux respond to chemical and physical cues. We do not know whether plants sense the turnover of the lipids or simply second messenger produced, but as authors of the Chapter 8 states that both are important. Signalling between organelles and nucleus is manifested in the nucleus as a change in the activity of DNA-binding proteins, which are mainly transcription factors that specifically interact and modulate the regulatory regions of genes. Chapter 11 summarises data on plastid-to-nucleus and mitochondria-to-nucleus communication, while Chapter 13 is focused on interaction of multiple signals modulating guard cell movement.

The volume consists of 14 chapters written by 32 authors from all over the world. It is well edited. Authors presented a new important data, reflecting mainly a genetic progress in plant communication and signal transduction. Therefore, the book may be intended rather for academic staff and/or researcher than undergraduate students.

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