

Computational Models for Studying Signalling Control Mechanisms behind Legume Autoregulation of Nodulation

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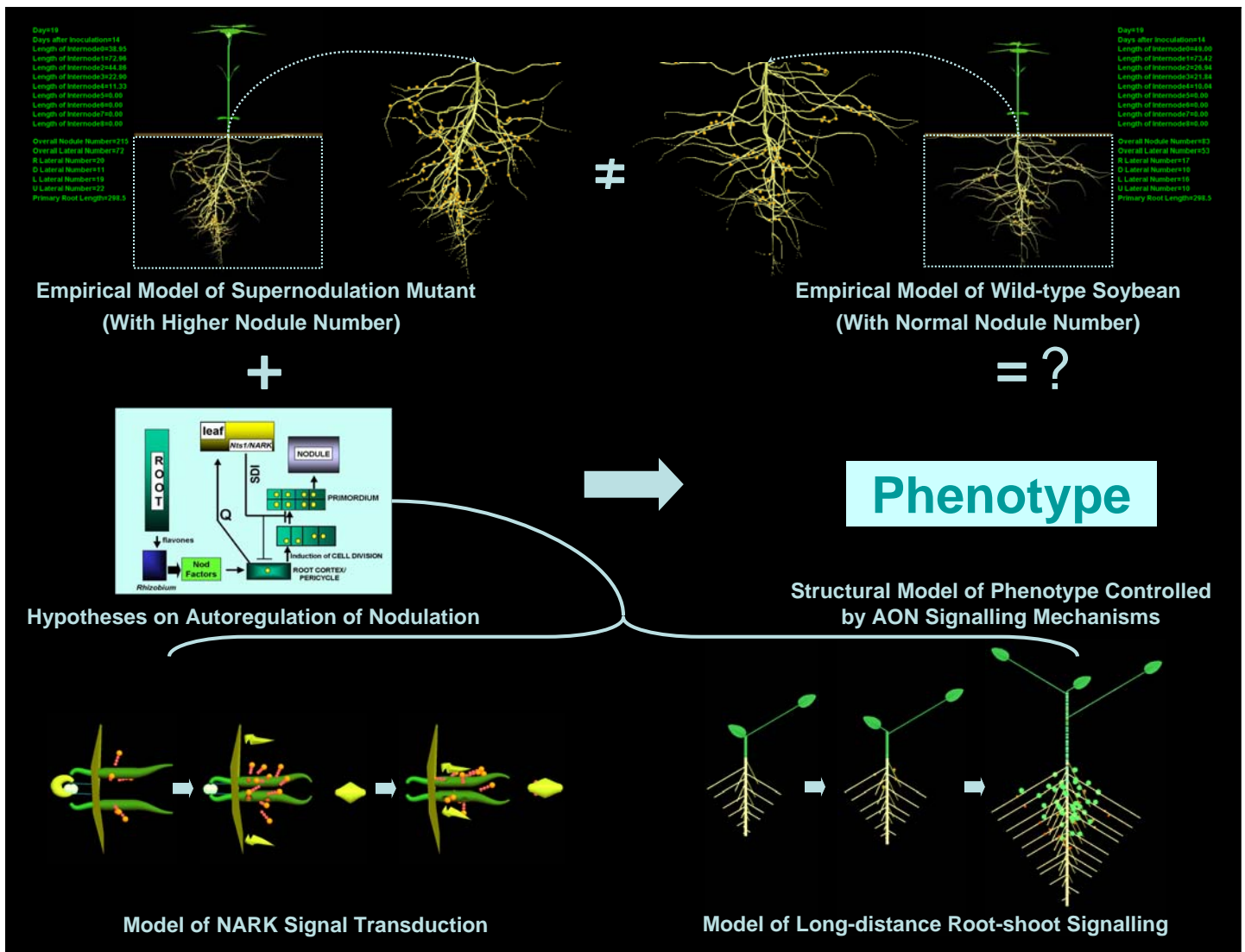
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Nitrogen fixation by legumes is the product of a symbiosis of legume plants and a group of soil bacteria known as rhizobia, in which the plant invests its resources in new organs called nodules to house the bacteria. A balance between nodulation and other growth processes is maintained by a regulatory process called autoregulation of nodulation (AON), which is still incompletely known. The purpose of this study is to develop L-system¹ computational models for further investigating signalling control mechanisms behind AON. The general methodology is to build multi-scale models incorporating intra- and inter-cellular signalling, long-distance signalling and phenotypic development controlled by these mechanisms. These models could then serve as tools for hypotheses verification and prediction.



¹Prusinkiewicz, P. and Lindenmayer, A. 1990. The Algorithmic Beauty of Plants, Springer-Verlag New York, Inc, New York.