

The emerging story of plant roots

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An international group of European and US scientists led by the Centre for Plant Integrative Biology at The University of Nottingham have uncovered a fascinating new insight into the unseen side of plant biology — the root.

Although less visible than shoots, leaves and flowers, plant roots are critical to our lives. They provide the crops we eat with water, nutrients, a firm anchor and a place to store food. Roots are complex branching organs and show a wide variation in the way they grow through the soil to exploit the available resources.

The way that new lateral roots are formed and grow is key to this process. Lateral roots originate deep within the parent root and must emerge through intervening layers of tissues before entering the soil. Despite its importance to the integrity and architecture of the root system, little is known about the regulation of lateral root emergence. This question has fascinated, yet frustrated, scientists since the nineteenth century.

A paper appearing in *Nature Cell Biology* reveals for the very first time how lateral root emergence is achieved. It reports that new lateral roots reprogramme the cells that overlay them, causing them to separate and enabling the new root to emerge. In short, the scientists have discovered how new roots open the door to the world outside.

Professor Malcolm Bennett, Biology Director for the Centre for Plant Integrative Biology and Head of Division of Plant and Crop Sciences,

said: "In addition to providing new biological insight into lateral root emergence, we have identified a large number of genes that control this process. This is really important because this may enable us to breed crops with improved root architecture in the future."

The Centre for Plant Integrative Biology (CPIB) is funded by the Systems Biology joint initiative of the Biotechnology and Biological Sciences Research Council (BBSRC) and the Engineering and Physical Sciences Research Council (EPSRC) which has provided £27m for six specialised centres across the UK. The Division of Plant and Crop Sciences is one of the largest communities of plant scientists in the UK. Around 160 people work in the division, which welcomes visiting scientists from all over the world, reinforcing its reputation as a world-renowned centre.

This international collaboration involved more than 20 scientists from laboratories based in Belgium, France, Germany, Spain, Sweden, USA and UK.

Source: University of Nottingham

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