

First in Plants

Plants are the foundation for virtually all agricultural systems and ecosystems on the planet, so it is important to understand how they work. But discoveries made in plants can have an impact well beyond this. Plant science has provided, and will continue to provide, many of the fundamental concepts for the whole of biology and medical science. Here are just a few examples.



Cells (1655) Microscopic observations of thin sections of cork led Robert Hooke to discover cells, the building blocks of life.



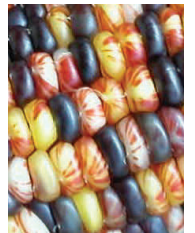
Cork cells as seen by Robert Hooke.¹

The principles of genetics (1866) Gregor Mendel's experiments with pea plants allowed him to formulate the basic rules for genetic inheritance of traits.



Round and wrinkly peas.²

Transposons (1948) Barbara McClintock used genetics and observations of maize chromosomes to discover transposons, sometimes called jumping genes. These are bits of DNA that move about the genome and can influence the expression of other genes.



Many colour variants in corn are caused by transposons.³

Totipotency of cells (1957) Using tobacco cell cultures, Folke Skoog proved the idea proposed by Gottlieb Haberlandt that adult cells could give rise to all cell types. This is the fundamental basis for stem cell biology.



Impatiens propagation with new roots growing from a stem.⁴

Post transcriptional gene silencing (1990s) The discovery that extra copies of a gene introduced into the genome can trigger silencing of both the introduced and endogenous gene was made first in petunias. The mechanism involved was later shown to involve small RNAs.



Introduced extra copies of a gene can turn off the gene making purple pigment in petunias.⁵

1. ['Cells in cork oak from Robert Hooke'](#), uploaded by Martin LaBar. 3. Cropped from ['Indian Corn'](#), by Vilsesbogen S. ['Petunia'](#), by Yash Gupta. All available under a [Creative Commons CC BY-NC Licence](#). 2. ['Pisum sativum subsp. sativum Sativum-Gruppe \(Saatgut\)'](#) by andreasbalzer. Available under a [Creative Commons CC BY-NC-SA Licence](#). 4. ['Impatiens propagation'](#), by mellowynk. Available under a [Creative Commons CC BY-NC-ND Licence](#). Text and image collection for this poster is licenced under [Creative Commons CC BY-NC-SA Licence](#) © Sainsbury Laboratory, University of Cambridge, 2014.

