

The Plant

(*Arabidopsis thaliana*)

“A plant is like a

Despite its weedy appearance, *A. thaliana*, commonly known as thale cress or mouse-ear cress, is the undisputed model plant. Ease of cultivation, rapid life cycle, and high seed production are bolstered by small genome size and ease of transformation. As a result of evolutionary conservation, many of the fundamental advances using *Arabidopsis* are finding useful application in the improvement of crops such as maize, wheat, and rice.



‘Omics

Genome size: 125 Mb
(115,409,949 bp sequenced)

Average gene: 2 kb,
5 exons per gene

Chromosomes: 5

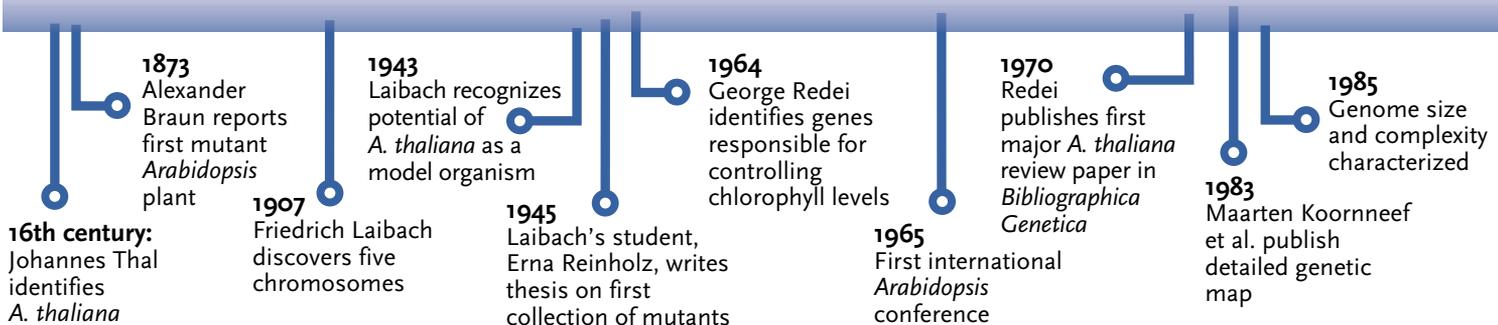
Proteins: ~25,500

Number of genes: 25,498 from
11,000 gene families

Web Sites

Arabidopsis Information Resource: www.arabidopsis.org

Arabidopsis Principal Investigators Index:
www.arabidopsis.com/main/com/!ac.html



self-willed man, out of whom we can obtain all which we desire, if we will only treat him his own way.”

—Johann Wolfgang von Goethe (1749–1832)



Stats

Height: 15–20 cm

Life cycle: 6 weeks from germination to production of mature seeds

Fertilization: Readily self-fertilizes to produce homozygous stocks

Seed production: 5,000 per plant

Feature Technology

DNA Microarrays: These provide a way of measuring the activity of thousands of genes simultaneously. The array is an orderly presentation of immobilized nucleic acids, each of which is specific for a given gene sequence. RNA is purified and translated into cDNA (complementary DNA), which is fluorescently labeled and allowed to react with the array. Gene expression is indicated by binding of the fluorescent samples to the immobilized probes. Researchers use arrays to study oxidative stress, plant-pathogen interactions, circadian cycle, and many other topics.

Nobel (non)Moment

In 1998, three pharmacologists won the Nobel Prize in physiology for their work in discovering the importance of nitric oxide in the human body. The Nobel Assembly announced: “This was the first discovery that a gas can act as a signal molecule in the organism.” Actually, R. Gane identified ethylene gas as a signal molecule in plants in 1934; ethylene pathways were mapped in *Arabidopsis* by the mid-1990s. Only two plant biologists have ever won the Nobel Prize.

Illustration: Tammy Irvine, Rear View Illustration

1986
Transformation protocols using *Agrobacterium* established

1986
First *Arabidopsis* gene sequence published

1990
Arabidopsis Genome Project initiated

1991
Stock centers and database established

1991
Gerd Jurgens uses saturation mutagenesis to find source of crucifer mutation

1992
First chromosome walk published

1994
cDNA sequencing efforts initiated

1996
Arabidopsis Genome Initiative established

1997
Physical map of all chromosomes completed

2000
Genome sequence completed