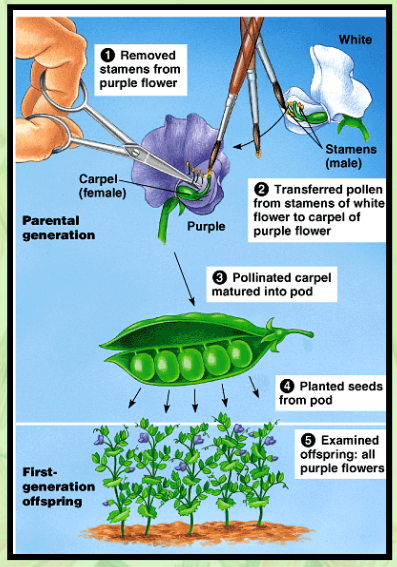
JohannGregor Mendel

The Father of Genetics

1822 - 1884


1 Removed stamens from purple flower
White
Stamens (male)
Carpel (female)
2 Transferred pollen from stamens of white flower to carpel of purple flower
Parental generation
Purple
3 Pollinated carpel matured into pod
4 Planted seeds from pod
5 Examined offspring: all purple flowers
First-generation offspring


JOHANN GREGOR
MENDEL
1822 – 1884
S4
REPUBLIK ÖSTERREICH

Chronology

- 1856
  - Begins his pea-plant experiments
- 1865
  - Mendel first articulates his findings
- 1866
  - ***Experiments with Plant Hybrids*** published
- Elected as abbot of his monastery where his duties prevented him furthering his research

Background

- Born into a German speaking family
- Worked as a gardener, studied beekeeping and as a young man attended the Philosophical Institute of Olomouc in 1840-43
- Upon recommendation of his physics teacher entered the Augustinian Abbey of St. Thomas in Brno in 1843

Background

- Inspired by his professors at the university and his colleagues at the monastery to study variation in plants
- Conducted his study in the monastery's garden
- Between 1856 and 1863 cultivated and tested some 29,000 pea plants (Pisum sativum)

Just Twelve Years

- Only a limited part of his career spent on genetics
- Up to 1856 his time was spent on religious duties or training
- Tried to pass his teaching qualifications but failed in part due to his lack of success in biology
- From 1868 became abbot of his monastery and consequently had to give up the majority of his scientific research

The Humble Pea-Plant

- Mendel's laboratory was the monastery's garden
- His subject was the humble pea-plant
- Was fascinated by what caused the different characteristics of these plants to occur – e.g. Blossom colour, seed colour and height
- Undertook a systematic study of when these features occurred in descendent generations
- Cross-fertilized plants with different characteristics and recorded the results

Understanding Heredity

- Common assumption at the time was that when two alternate features were combined, an averaging of these features occur
- Statistical results Mandel collaborated proved plants did not average out to a medium but instead inherited the original features in a ratio of 3:1 according to the "dominant" trait

Understanding Heredity

- Assumed each parent carried two possibilities for any given trait
- Gene “A” and gene “B” for trait “X”
- Only one gene from each parent would carry into the offspring (now described as Mendel’s law of segregation)

Understanding Heredity

- Gives four possibilities:
  - AA, AB, BA, BB
- The 3:1 ratio would be achieved because the "dominant" gene would feature whenever it were present
- If "A" were the dominant factor, it would occur three times in four, with the "B" scenario only occurring when a "BB" result was obtained

Delayed Recognition

- First articulated his results in 1865
- His conclusions were largely ignored during his lifetime
- Only when three other scientists:
  - **Hugo de Vries (1848-1935)**
  - **Karl Erich Correns (1864-1934)**
  - **Erich Tschermak von Seysenegg (1871-1962)**

  independently came across similar evidence in 1900 that Mendel was rediscovered

Legacy

- Although he did not gain any recognition for his work during his lifetime, he was well respected and liked by his fellow monks and townspeople.
- Today, Mendel is regarded as the father of the study of genetics