



Mendel 1865

Miescher 1869

Boveri y

Sutton 1902

Morgan 1911

Griffiths 1928

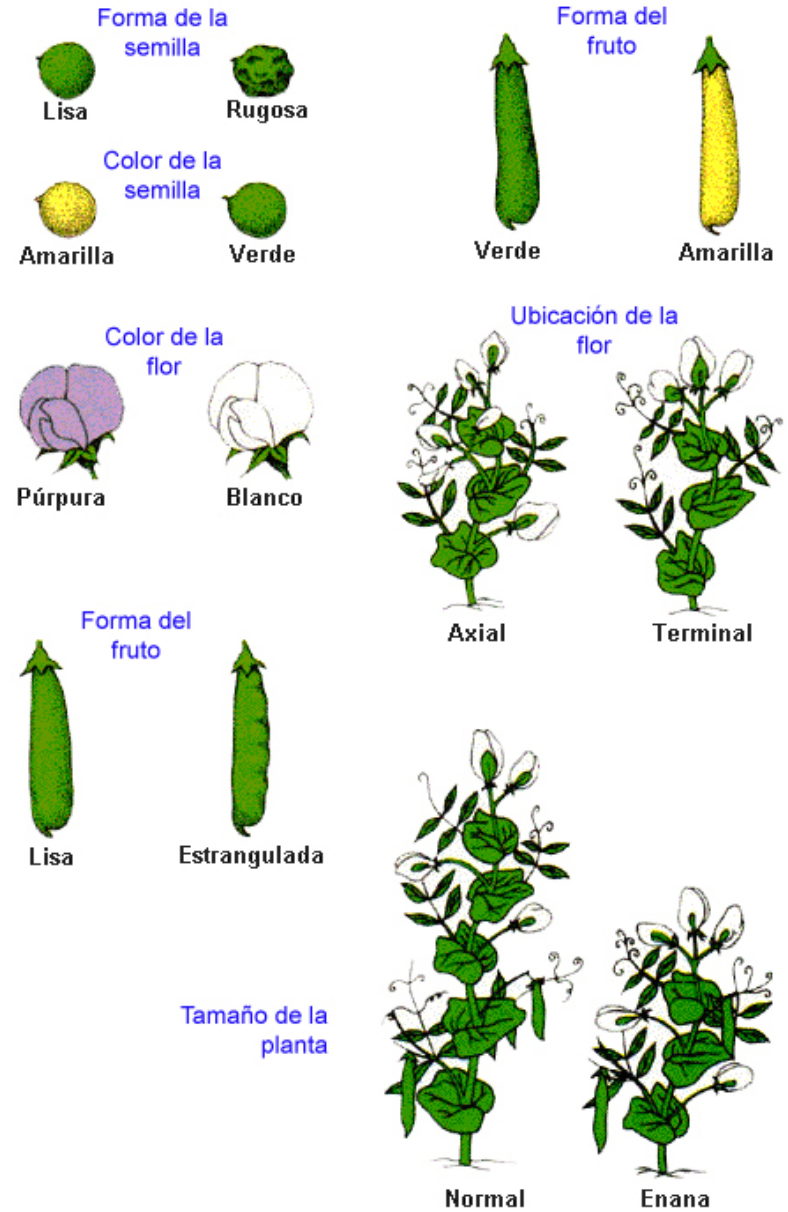
Avery et al 1944

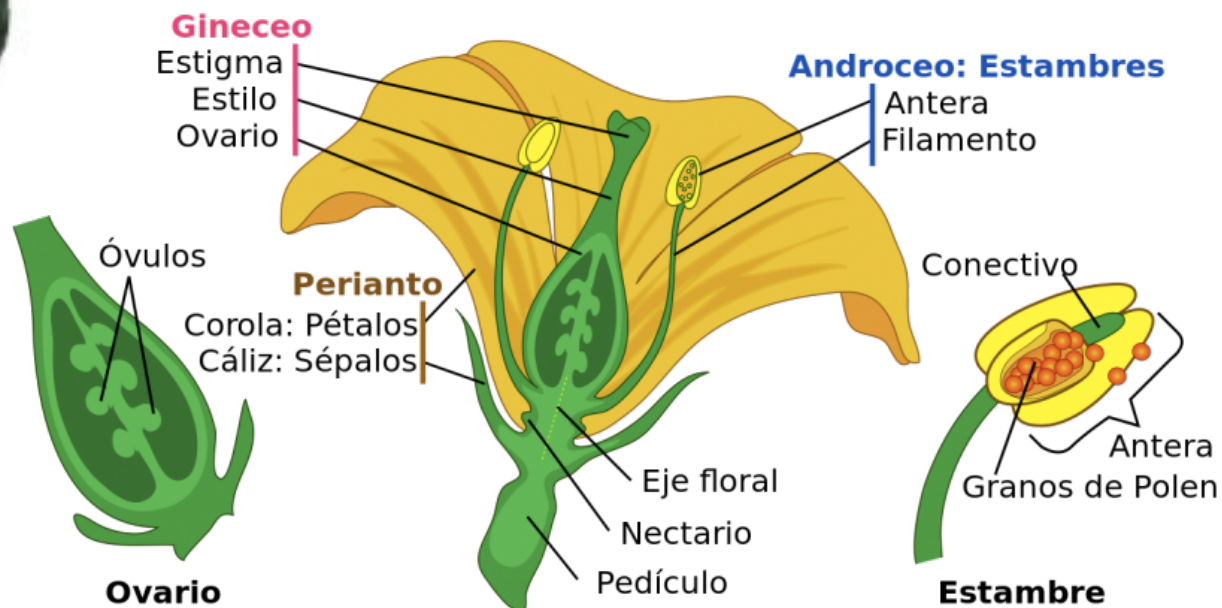
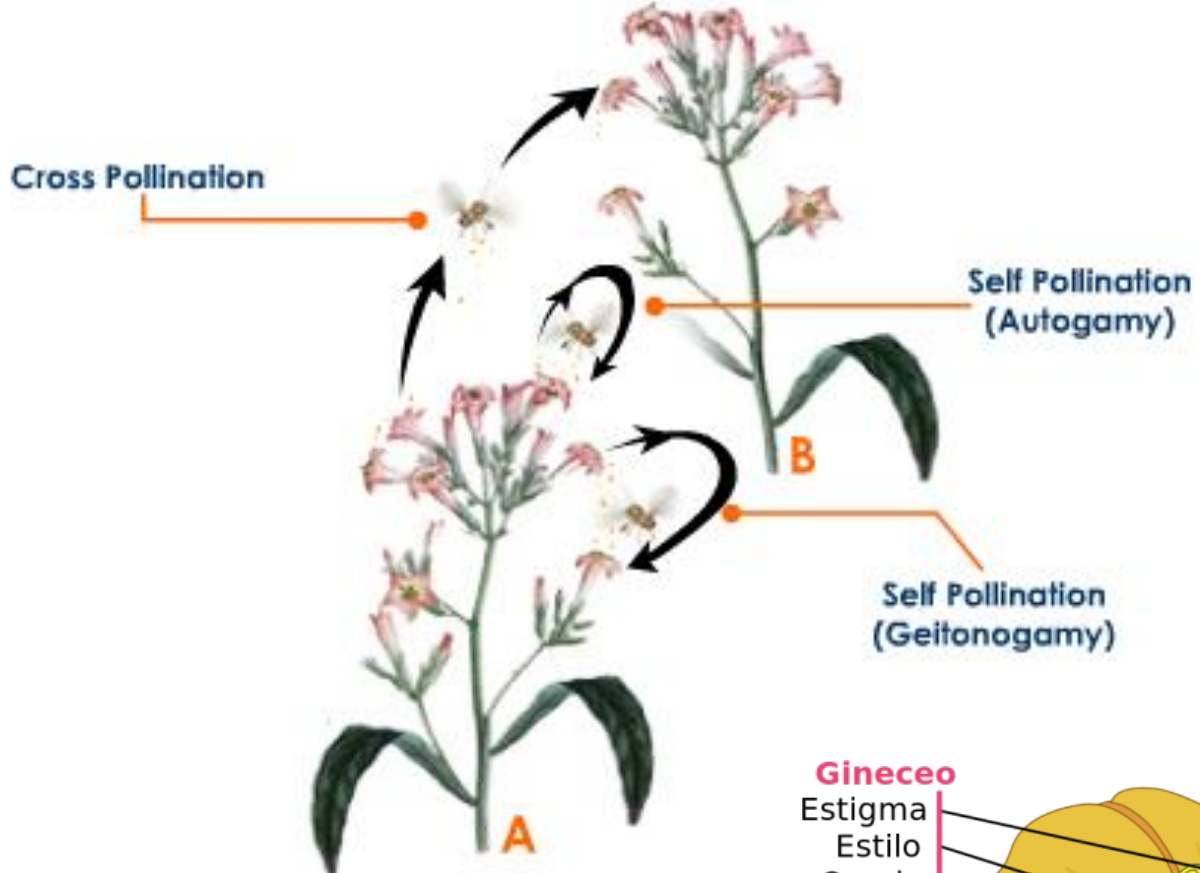
Hersy Chase 1952
Watson Crick 1953

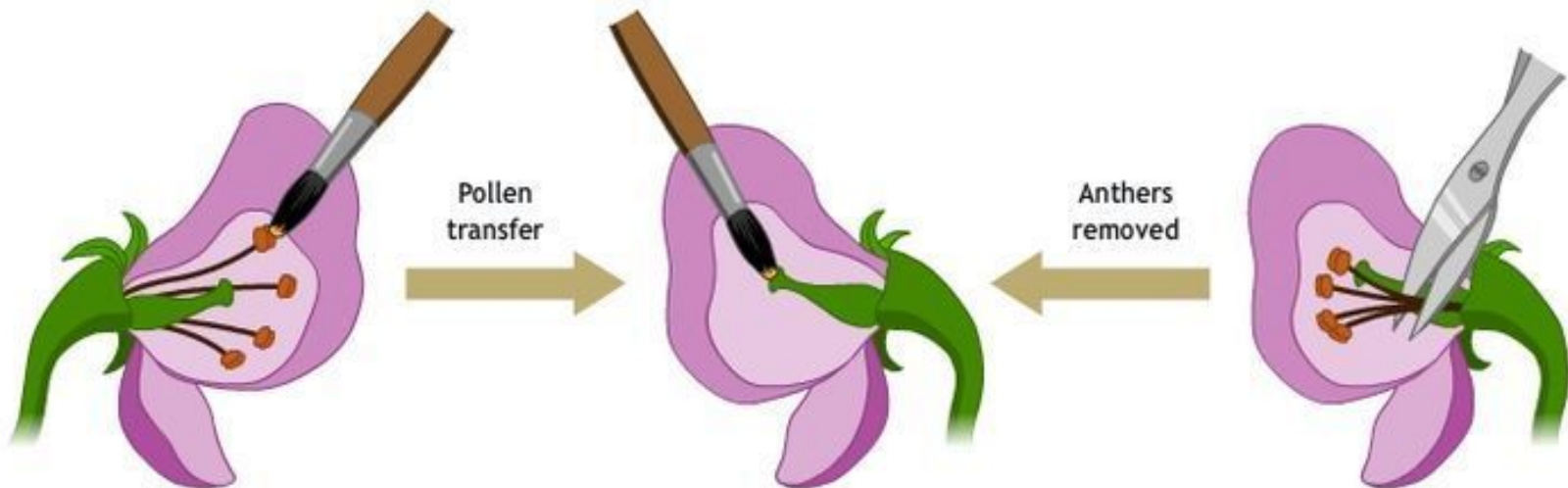
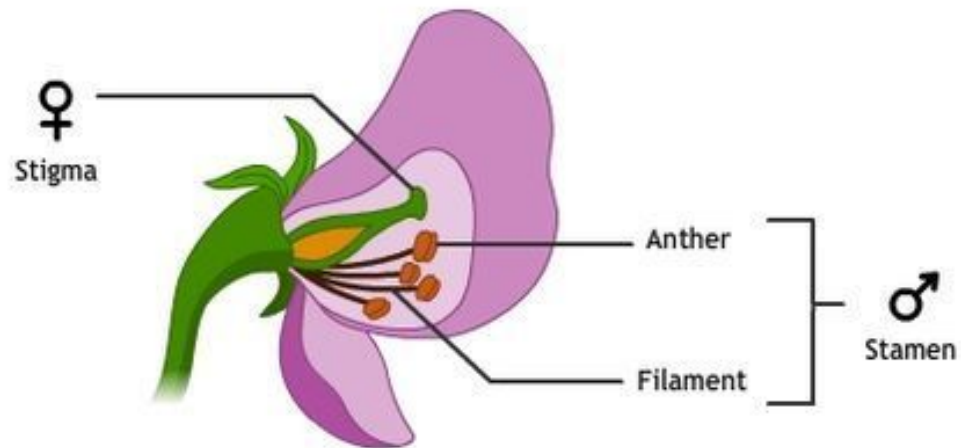
Meselson Stahl 1958



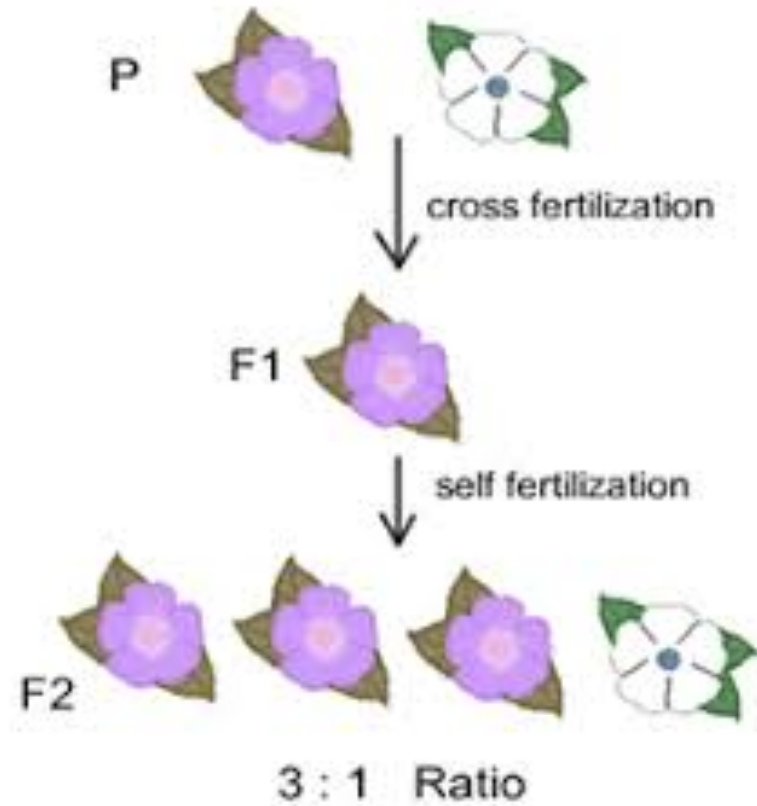
Gregor Johann Mendel
1822 - 1844

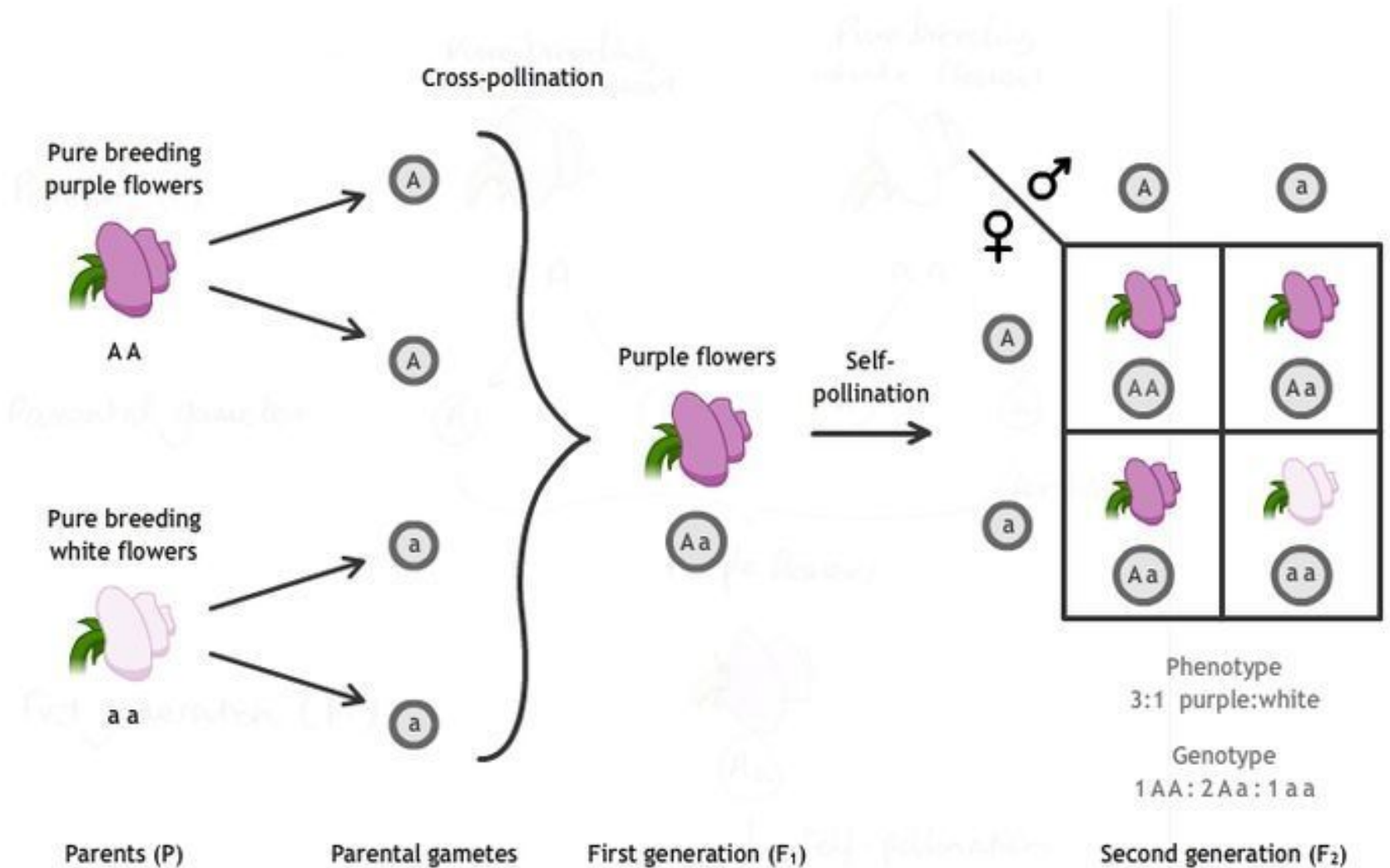






Líneas Puras





Pure breeding
round, yellow
seeds



$RRYY$



RY

Pure breeding
wrinkled, green
seeds



$rryy$



ry

Round, yellow
seeds



$RrYy$

Self-
pollination

RY

rY

Ry

ry

	RY	rY	Ry	ry
RY	 $RRYY$	 $RrYY$	 $RRYy$	 $RrYy$
rY	 $RrYY$	 $rrYY$	 $RrYy$	 $rrYy$
Ry	 $RRYy$	 $RrYy$	 $RRyy$	 $Rryy$
ry	 $RrYy$	 $rrYy$	 $Rryy$	 $rryy$

Parents (P)

Parental gametes

First generation (F_1)

9 Yellow, round
3 Green, round

3 Yellow, wrinkled
1 Green, wrinkled

Second generation (F_2)

Mendel 1865
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Morgan 1911

Griffiths 1928

Avery et al 1944

Hearsy Chase 1952
Watson Crick 1953

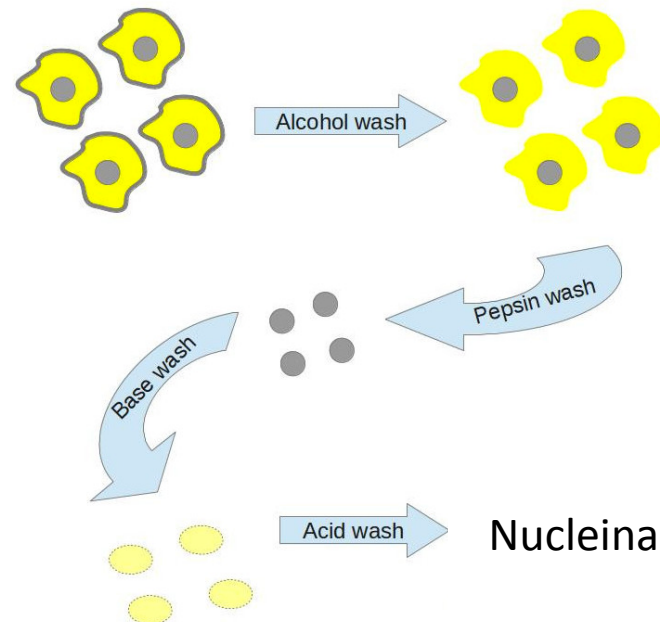
Meselson Stahl 1958



Friedrich Miescher

Courtesy of Mr. Courvoisier, Portrait Sammlung,
University of Basel.
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A partir de muestras extraídas de vendajes usados de un hospital, purifico la “nucleína” de glóbulos blancos, más tarde llamada “ácido nucleico”.



Nucleína

Mendel 1865
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Sutton 1902
Morgan 1911

Griffiths 1928

Avery et al 1944

Hearsy Chase 1952
Watson Crick 1953

Meselson Stahl 1958



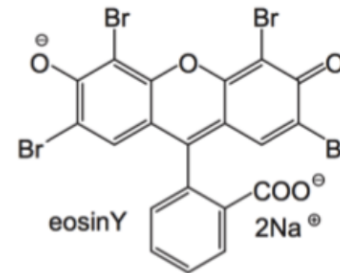
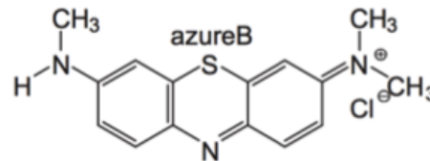
Walter Sutton
(izquierda) y Theodor
Boveri (derecha)

Teoría Cromosómica



Cuerpo de color

Tinción con Giemsa



Cariotipo: conjunto de cromosomas de una especie o individuo

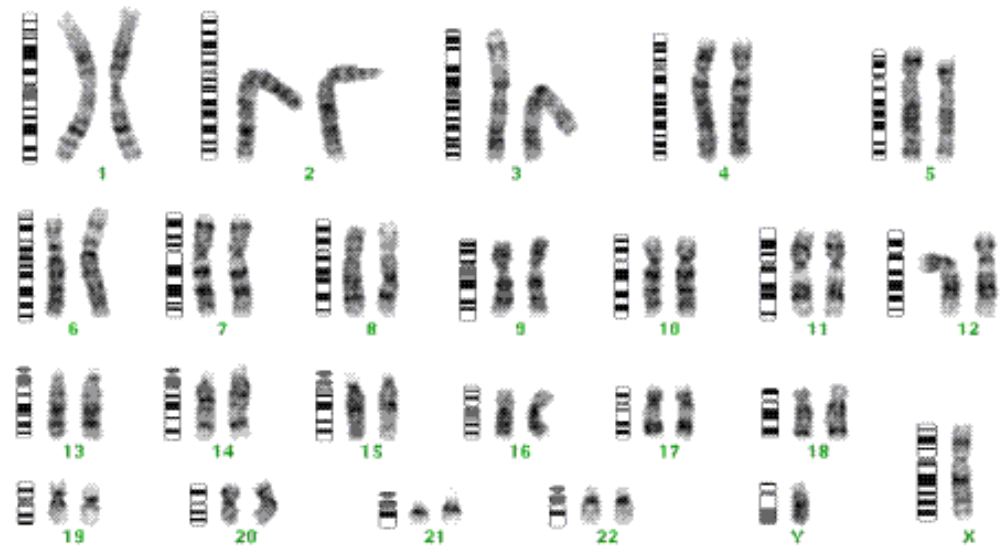
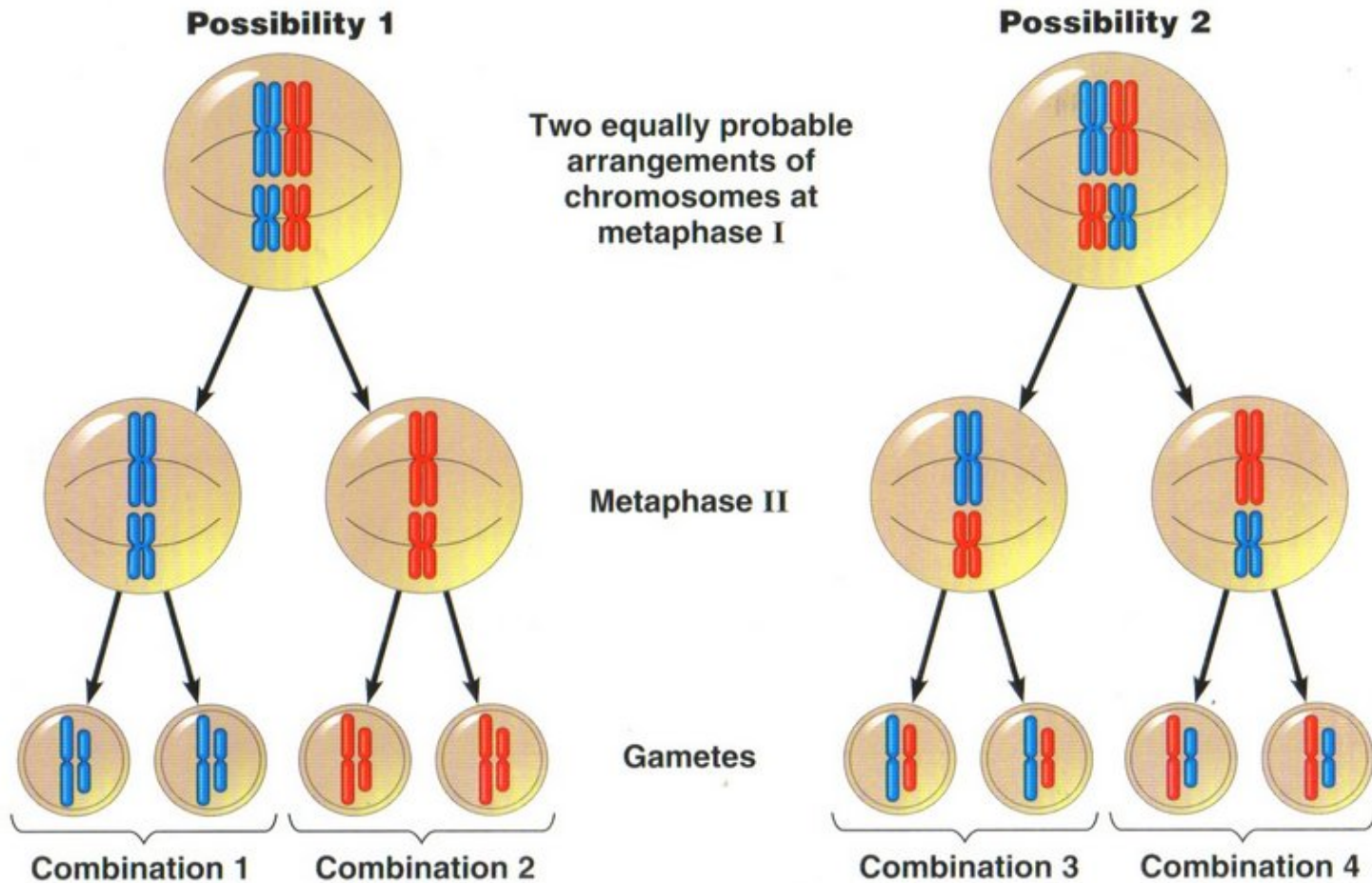


Figure 8.16 Results of the independent orientation of chromosomes at metaphase I





Thomas Hunt Morgan
1866-1945

Mendel 1865
Miescher 1869

Boveri y
Sutton 1902
Morgan 1911

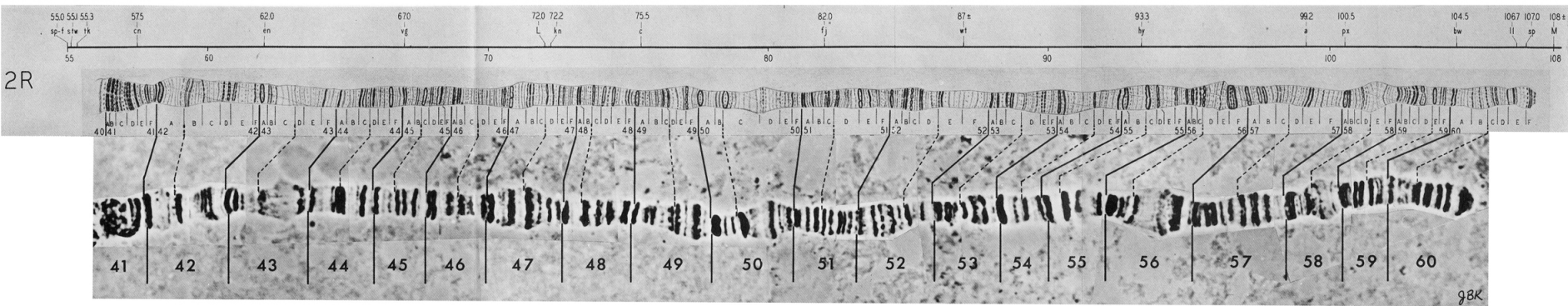
Griffiths 1928

Avery et al 1944

Hearsy Chase 1952
Watson Crick 1953

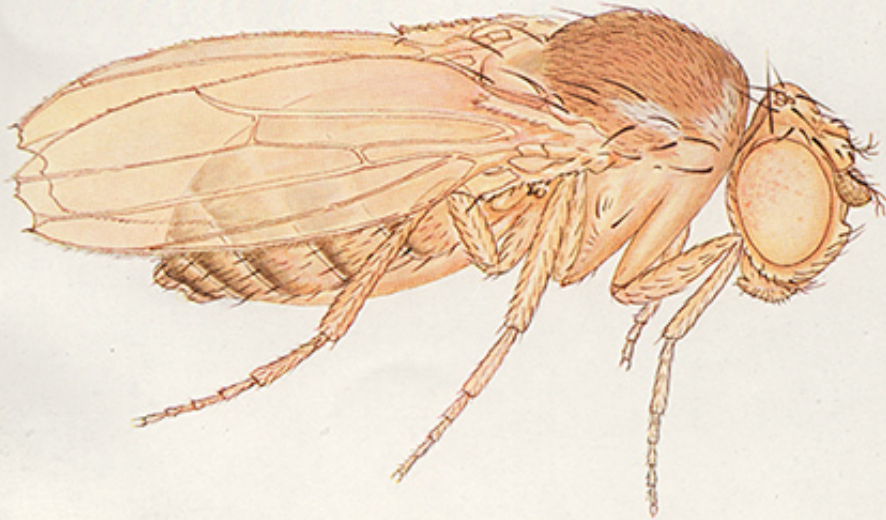
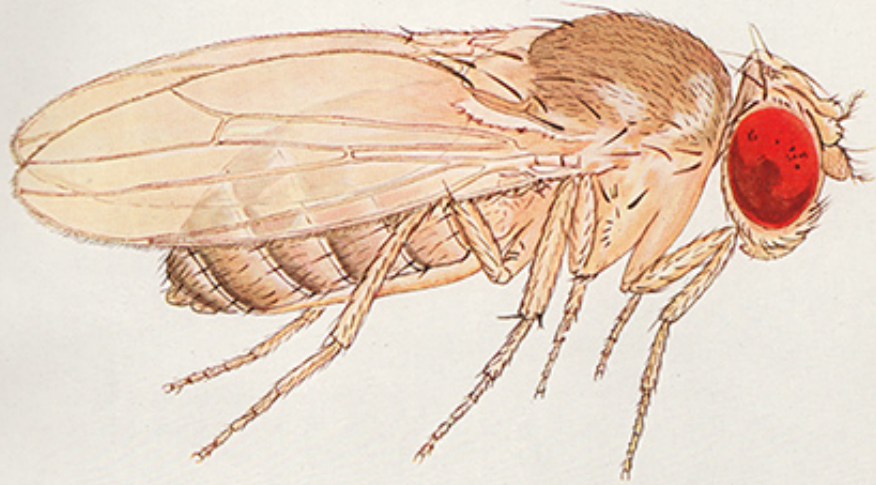
Meselson Stahl 1958

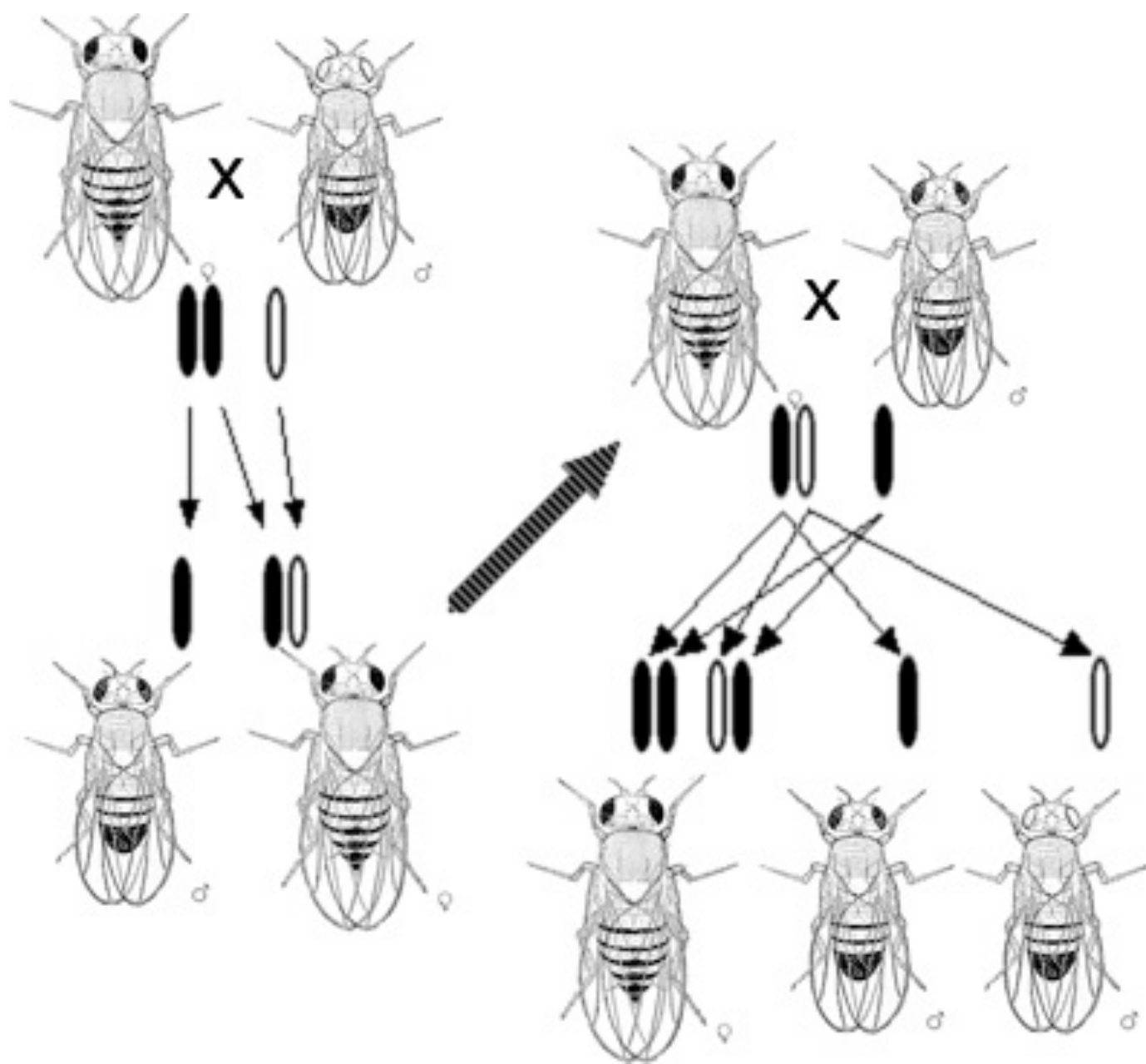




Cromosomas politénicos

FIGURE 3



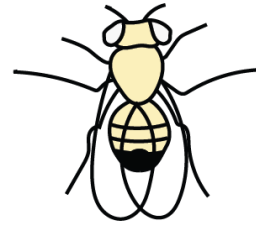


P



♀ red-eyed female
(wild type)

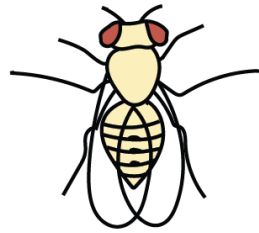
x



white-eyed male ♂

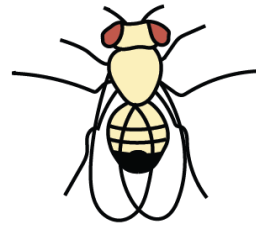


F₁



♀ red-eyed females

x



red-eyed males ♂



F₂

2



:

1



:

1



♀ red-eyed females

red-eyed males ♂

white-eyed males ♂

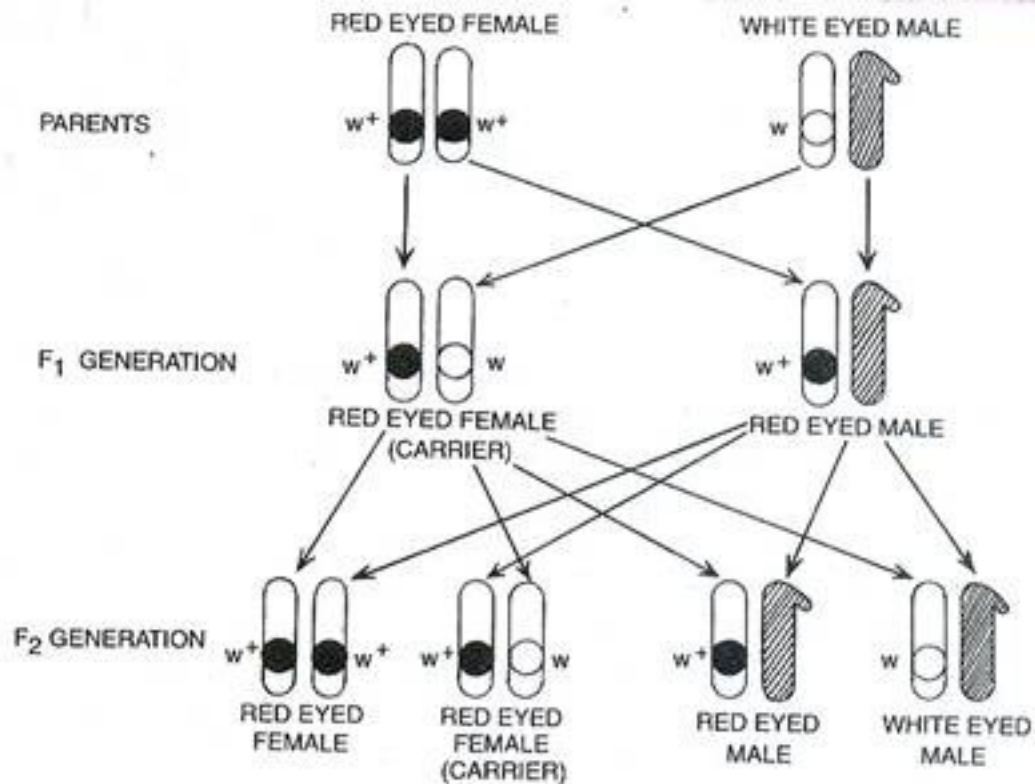


Fig. 5.28. Cross 1 of Morgan involving red eyed female *Drosophila* and white eyed male *Drosophila*. F₁ generation consisted of only red eyed flies. In F₂ generation all female flies were red eyed. 50% of the male flies were red eyed and the remaining 50% white eyed.



Frederick Griffith
(1879–1941)

Mendel 1865
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Sutton 1902
Morgan 1911

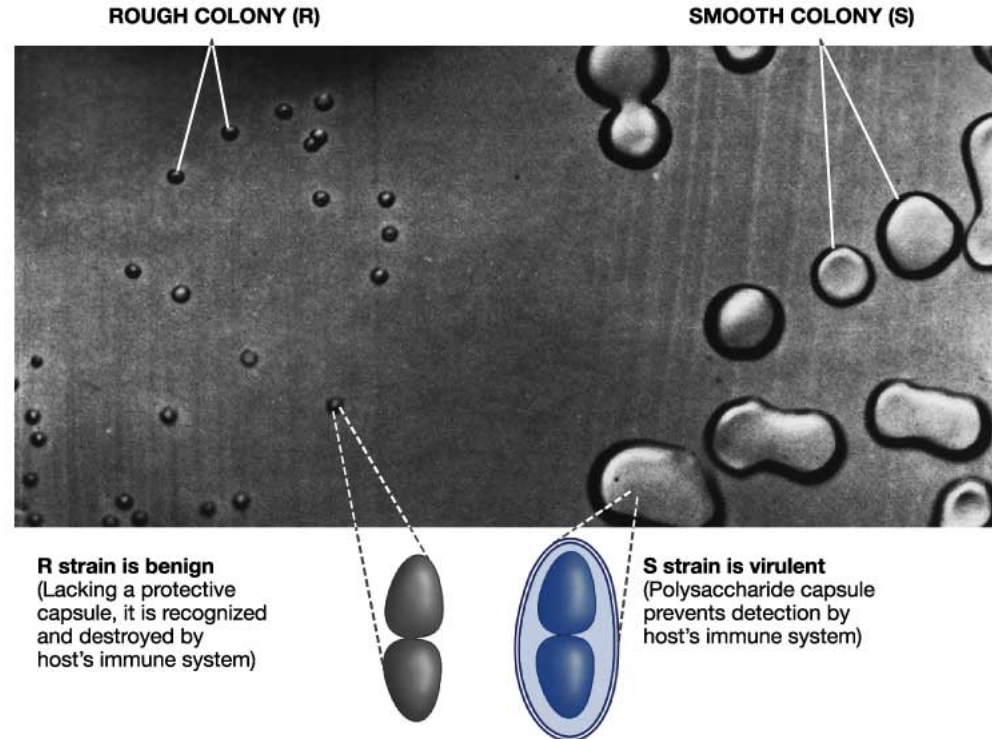
Griffiths 1928

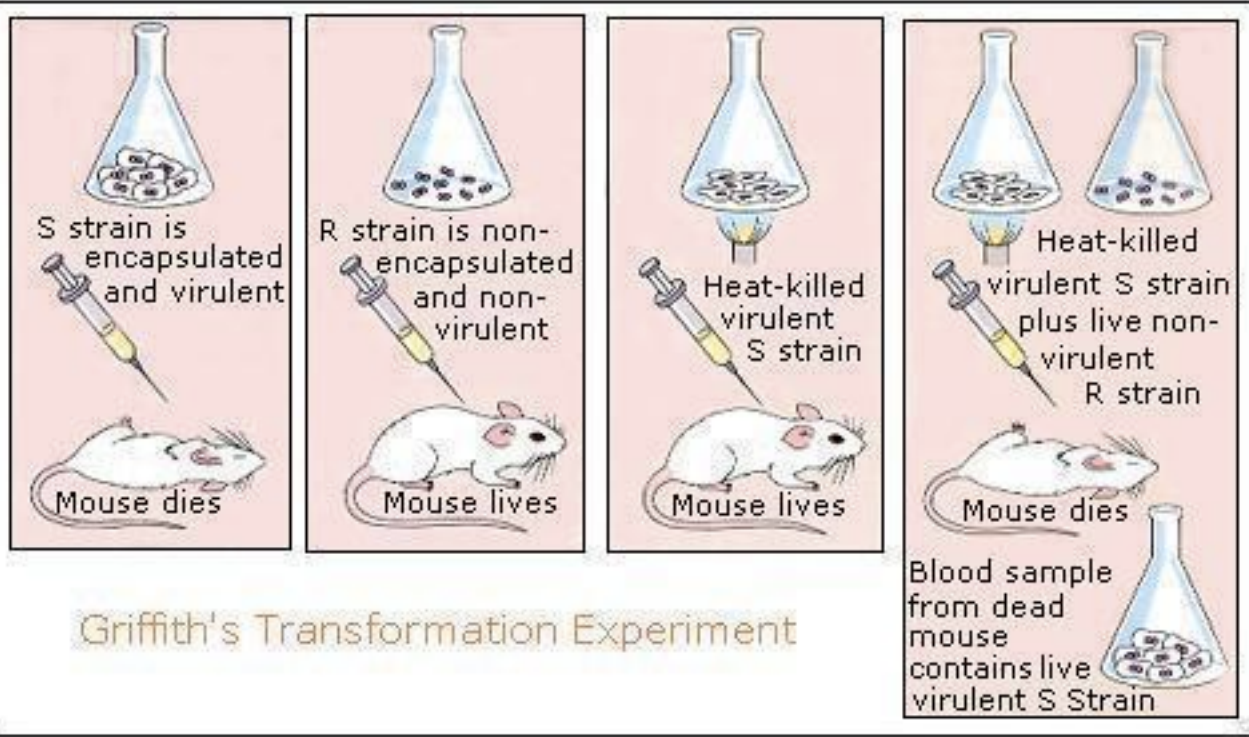
Avery et al 1944

Hearsy Chase 1952
Watson Crick 1953

Meselson Stahl 1958

There are two strains of *Streptococcus pneumoniae*.





Mendel 1865
Miescher 1869

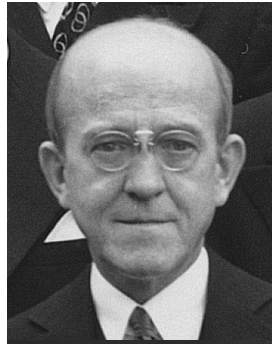
Boveri y
Sutton 1902
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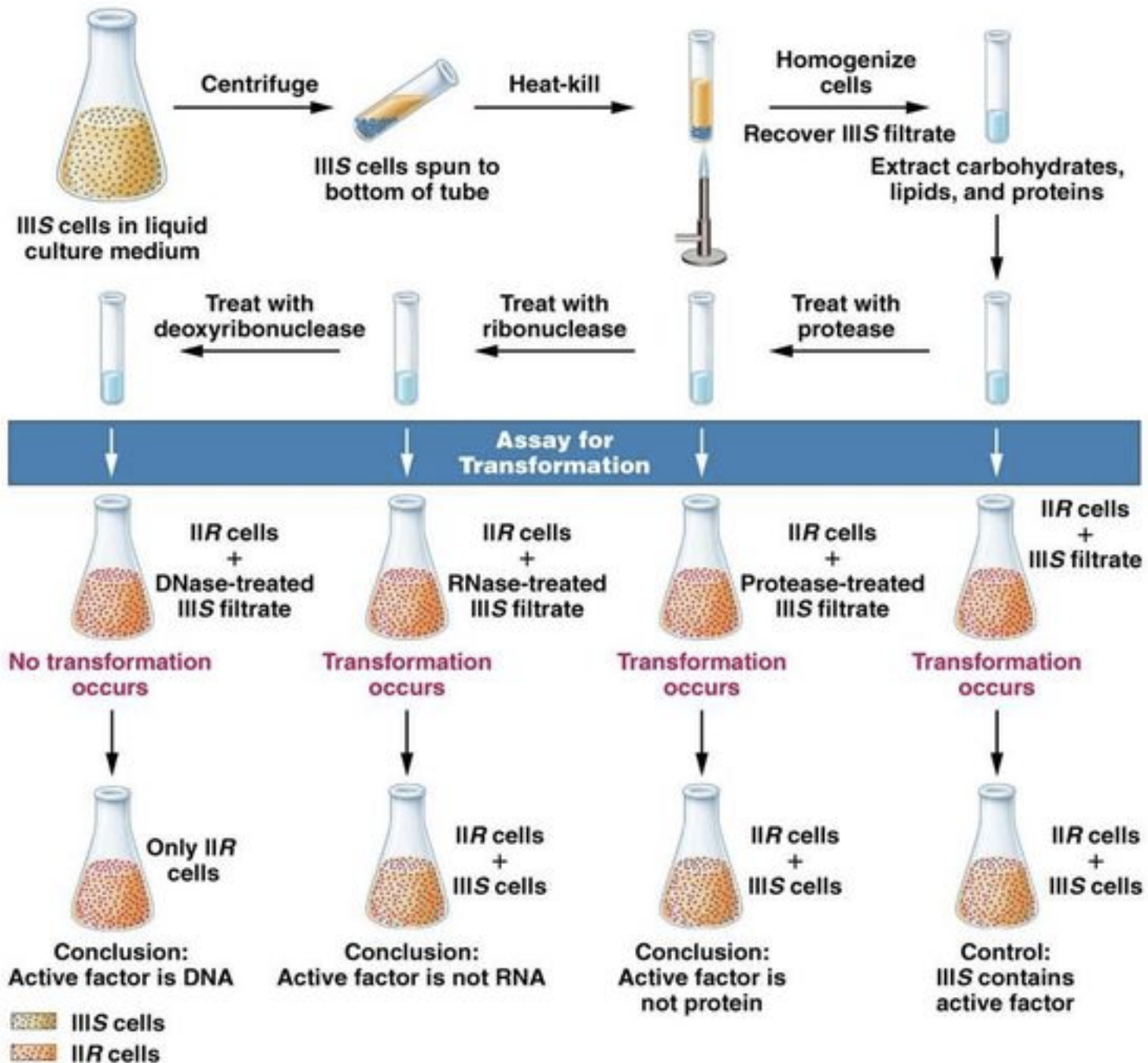


Oswald Theodore Avery
1877 - 1955



Colin Munro MacLeod
1909 - 1972

Maclyn McCarty
1911 - 2005



Mendel 1865

Miescher 1869

Boveri y

Sutton 1902

Morgan 1911

Griffiths 1928

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Watson Crick 1953

Meselson Stahl 1958

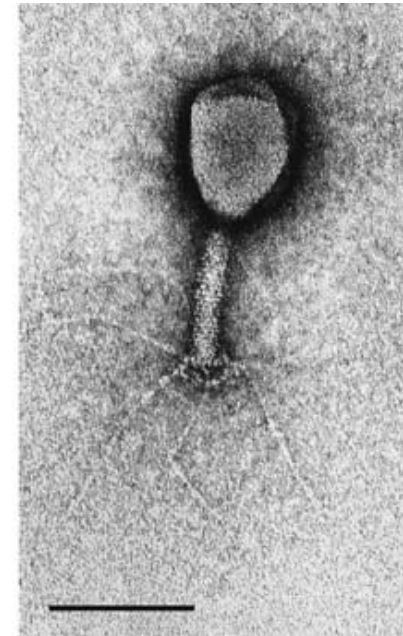
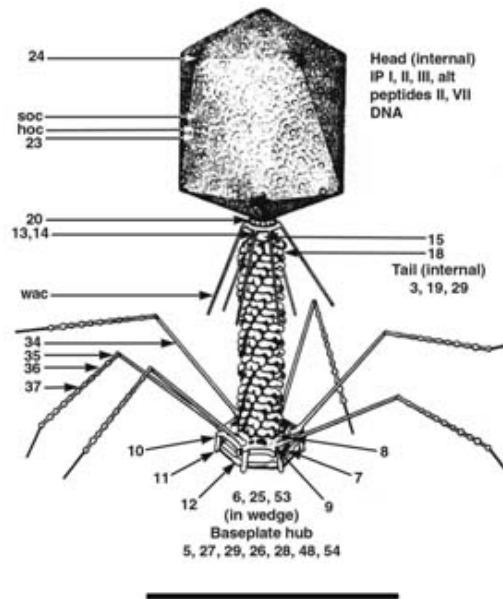


Alfred Day Hershey 1908 - 1997



Martha Cowles Chase
1927 - 2003

Bacteriófago T2



Experiment 1

1a T2 phage are grown in a medium containing ^{32}P (P is an element in DNA but not in proteins).

^{32}P -containing DNA

Bacteria

METHOD

Experiment 2

1b T2 phage are grown in a medium containing ^{35}S (S is an element in proteins but not in DNA).

^{35}S -containing protein coats

Bacteria

2 The labeled viruses are used to infect bacteria.

3 After a short time, mixing in a blender detaches viruses from bacterial cells.

4 Centrifuging forces the bacterial cells to the bottom of the tube, forming a pellet. Supernatant fluid contains the viruses.

RESULTS

5a Most of the ^{32}P is in the pellet with the bacteria.

Pellet

5b Most of the ^{35}S is in the supernatant fluid with the viruses.

Supernatant fluid

Conclusion: DNA, not protein, enters bacterial cells and directs the assembly of new viruses.

The Hershey-Chase Experiment Because only DNA entered the bacterial cell during infection by labeled bacteriophage, the experiment demonstrated that DNA, not protein, is the hereditary material.

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Miescher 1869

Boveri y

Sutton 1902

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Griffiths 1928

Avery et al 1944

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Watson Crick 1953

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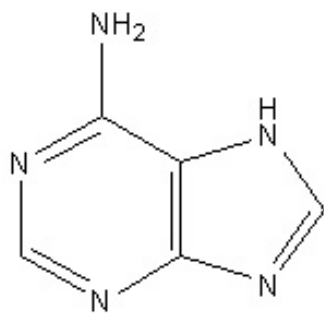
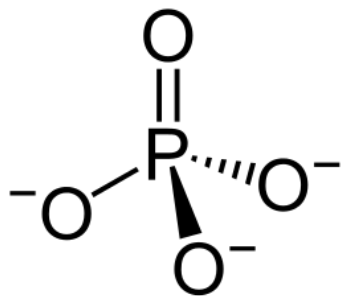
Courtesy of Cold Spring Harbor Laboratory Archives. Noncommercial, educational use only.

Francis Harry Compton Crick
1916 - 2004

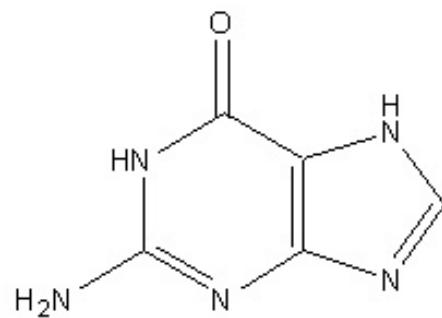
James Dewey Watson
1928



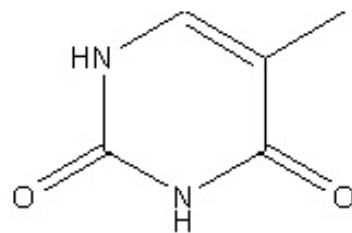
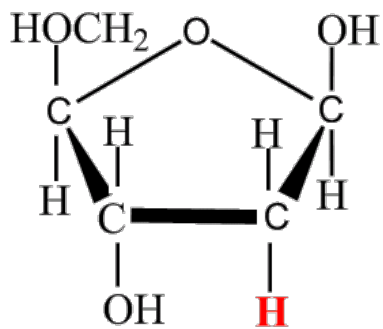
Rosalind Elsie Franklin
1920 - 1958



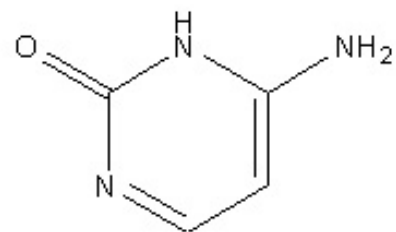
adenine



guanine

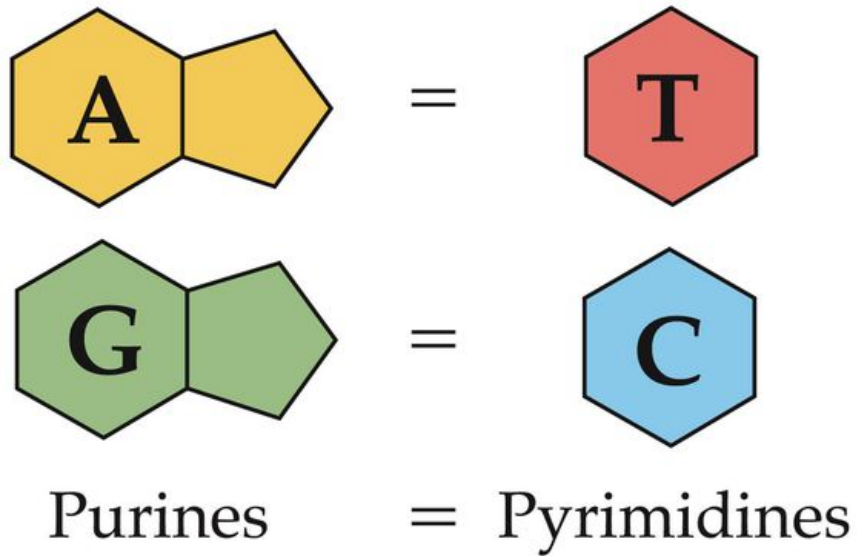


thymine



cytosine

Reglas de Chargaff



LIFE: THE SCIENCE OF BIOLOGY, Seventh Edition, Figure 11.5 Chargaff's Rule
© 2004 Sinauer Associates, Inc. and W. H. Freeman & Co.

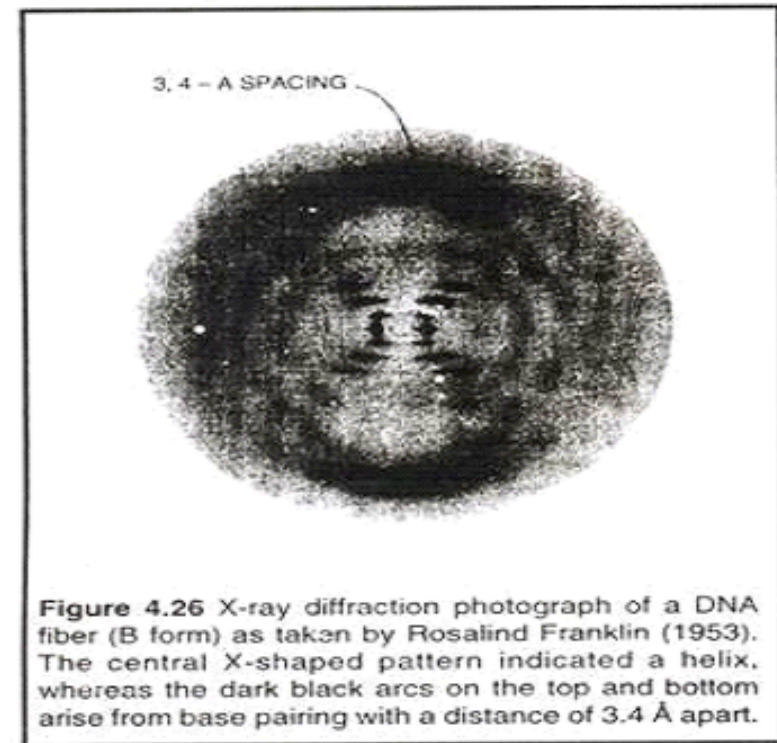


Figure 4.26 X-ray diffraction photograph of a DNA fiber (B form) as taken by Rosalind Franklin (1953). The central X-shaped pattern indicated a helix, whereas the dark black arcs on the top and bottom arise from base pairing with a distance of 3.4 Å apart.

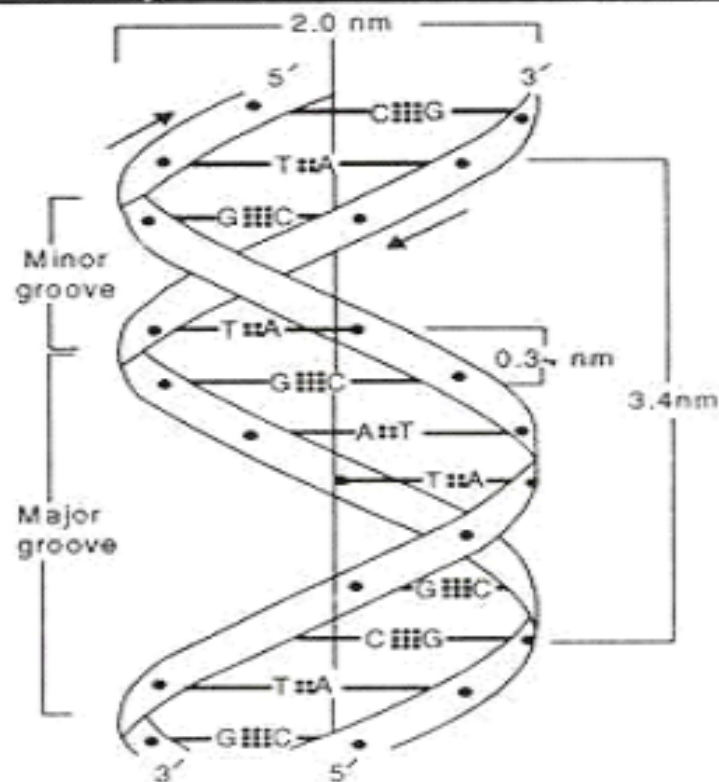


Figure 4.27 The structure of the Watson and Crick model of double-helical structure of the B-form of DNA (diagrammatic).

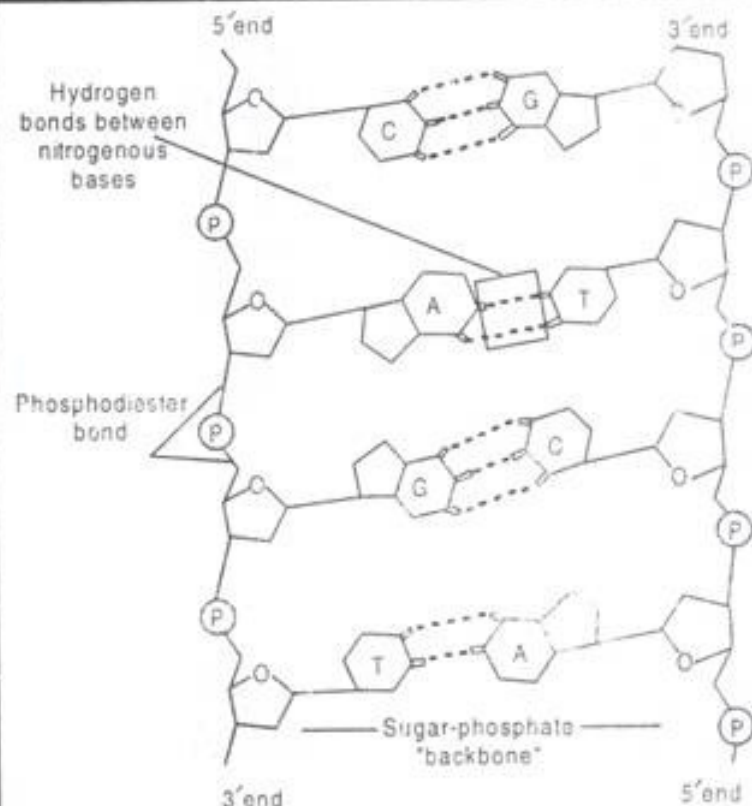
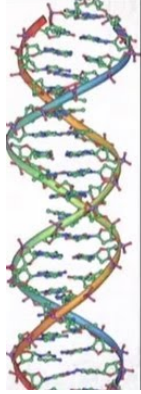


Figure 4.28 DNA. A hypothetically untwisted DNA lie flat to show the ladder-like appearance. The two sides of the ladder are called the DNA's "backbone". The steps inside the ladder represent "base pairs".



Mendel 1865
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Sutton 1902
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Griffiths 1928

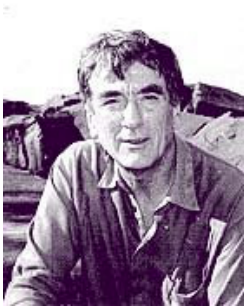
Avery et al 1944

Hersy Chase 1952
Watson Crick 1953

Meselson Stahl 1958



Matthew Stanley Meselson
1930



Franklin William Stahl
1929

(a) Conservative replication

(b) Dispersive replication

(c) Semiconservative replication

Original DNA

First replication

Second replication

