

GENETICS HISTORY

rvsd 27 Sept '96, 3 Jan 00, 3 Jan 01, 6 Jan 03, 6 Jan 04, 9 Jan 08, 7Jan09, 3Jan10, 4Jan12
 For excellent overview, see BKH, 6th, *World of the Cell*, pp 510-518 and p 10

Early practical Genetics: 10,000 yrs ago with domestication (**selective breeding** of animals with desirable traits)
 Probably dogs were the first to be selectively breed (keep the friendly wolf puppy, dispatch the others...)

The ancients made two critical observations must be explained:

Why do offspring look *like* their parents: = **HEREDITY**

Why do offspring look *different* from their parents: = **VARIATION**

deGraaf	1640	observed Graafian follicle on an ovary. Supporters proposed maternal inheritance
Leeuwenhoek	1644	semen under microscope, names animalcules , spawned those who thought they saw human form in sperm head, proposed paternal inheritance (maternal prenatal influence)
Jenken	19 th cent	supported blending of traits : Snapdragons: red x white yields pink, skin color (anti-Darwin)
Gregor Mendel (His paper was ignored for 35 yrs)	1866	interbred and studied peas, using mathematical analysis. Proposed two laws: FIRST LAW OF EQUAL SEGREGATION : Each trait is due to a pair of hereditary factors which segregate during gametogenesis with equal probability in a gamete. SECOND LAW OF INDEPENDENT ASSORTMENT Multiple sets of factors assort independently
DNA IS THE GENETIC MATERIAL:		
Karl W. von Nägeli	1842	Observed thread-like structures in cells producing pollen (disputed).
Friedrich Miescher (75 yrs ahead of time)	1869	Swiss physician, alkali extraction of "nuclein" from human pus from surgical bandages and salmon sperm (which is 90% nucleus). Proposed it to be the genetic material.
Walther Flemming	1880	used aniline dyes to see thread-like structures in dividing cells, termed the process mitosis .. Waldeyer-Hartz later termed the threads chromosomes .
Eduard Zacharias	1880s	botanist, showed that extraction of DNA from cells caused staining of chromosomes to disappear, inferred that DNA is genetic material.
Wilhelm Roux	1883	suggested that chromosomes might carry genetic information
Correns, von Tschermak, de Vries	1900	three scientists published that they independently and simultaneously rediscovered Mendel's work, understood its significance
Walter Sutton	1903	proposed "chromosome theory of heredity", linking Flemming's threads with Mendel's factors
Thomas H. Morgan	1910-1920	he and his grad students at Columbia used <i>Drosophila melanogaster</i> to show Sutton correct. (Inheritance of identifiable chromosome determined specific trait.) [END OF FIRST DAY?]
Robert Feulgen	1914	developed a stain preferential for DNA, showed component in chromosomes. But most thought DNA not the genetic material: 1) different degree of staining in cells 2) only four bases
Fredrick Griffith	1928	Showed transformation of rough (avirulent) <i>Pneumococcus</i> to smooth (virulent) <i>in vivo</i>
Avery, MacLeod and McCarty	1944	Demonstrated that DNA could transform bacteria (not protein, RNA, CH ₂ O or lipids). Concluded that "transforming principle" genetic material is DNA.
Beadle and Tatum	1940s	formulated "one gene-one enzyme" hypothesis using mutants of <i>Neurospora crassa</i> (The purpose of a gene is to specify a specific protein.)
Hershey and Chase	1952	Labeled protein with ³⁵ S, DNA with ³² P. Phage infection injects ³² P (DNA), not ³⁵ S (protein).
James Watson and Francis Crick [& Rosalind Franklin]	1953	elucidated the structure of DNA, relying heavily on Franklins Xray diffraction images.