Happy New Year

GENETICS

TUESDAY 1

what is genetics?

- The study of heredity is one of the most important sub-divisions of the biological sciences.

— The word "genetics" coined by Bateson in 1906. It is derived from the Greek word "gen"

— 'gene' means "to become" or "to grow into".

"Webster" defines genetics as "the branch of biology which deals with heredity and variations among related organisms, largely in their evolutionary aspect".

WEDNESDAY 2

"Heredity" may be defined as "tendency of the animals to resemble their ancestors and relatives"

whereas the 'Variation' is "the tendency through which the organisms differ in specific ways from one another."

3 THURSDAY

Genes

The genes are the important constituent located in chromosomes which initiate the action leading to the distinct hereditry charact They are the "ultimate unit of heredity"

- all animals and plants are composed are cells, either singly or in complex organizational patterns.

- Each cell has a nucleus which is very rich in highly complex nucleo-proteins

- DNA appears to be the basic living substance which has the capability of duplicatin itself to form more DNA, a prerequisite of

4 FRIDAY

any living thing.

Chromosomes

which are responsible for the passing of the hereditary traits from parent to offsprings.

Chromosomes are the carriers of genetic specifications that direct the fertilized egg to become a complete organis m.

All plants and animals

Interaction of genes or Non allelic interaction or factor hypothesis (or) Inter genic interaction

- Many characters are influenced by the interaction of two or more pairs of genes.

- Depending upon the form of interaction, Phenotypic ratios are modified in various ways, although the fundamental laws of the transmissions and heredity remain the same.

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① Complementary genes

② epistasis or inhibiting gene.

(Suppressor gene)

(i). Dominant epistasis

(ii). Recessive epistasis

effect of two alleles in a gene locus inhibiting another gene 2 alleles in a locus called R. epistasis.

- gene B expresses their character when epistatic gene 'A' dominant nature (AA or Aa)

In the epistasis 9:3:3:1 ratio 9:3:4 is 4 new

JANUARY 2013

1 TUE 2 WED 3 THU 4 FRI 5 SAT 6 SUN 7 MON 8 TUE 9 WED 10 THU 11 FRI 12 SAT 13 SUN 14 MON 15 TUE 16 WED

11 FRIDAY

eg: Mice fur Colour

① . Agouti
② . Black
③ . Albino .

Agouti Colour - responsible gene 'A'
A gene - hypostatic gene .
C' gene - epistatic gene .

① . gene arrangement ~~for agouti colour~~
ccAA, ccAa, ccaa - Colour - Albino

② . dominant allele C', when absence of dominant allele 'A', now ~~got~~ expres

12 SATURDAY "Black" fur - CC'aa, C'caa .

③ . dominant allele 'A' dominant C'
Double Gene Agouti Colour expressed gene arrangement
C'C'AA, C'cAA, C'C'Aa
~~C'cAa~~ C'cAa .

P, when C'C'aa Black X ccAA Albin

C'a

cA

F1 generation ♂ C'cAa X C'cAa ♀

cA Ca CA Ca

SUNDAY 13

	CA	C'a	cA	ca
C'A	C C' A A Agouti	C C' A a Ag	C c A A Ag	C' c A a Ag
C'a	C C' A a Agouti	C' C a a B	C c A a Ago	C c a a B
cA	C c A A Agouti	C c A a Agou	c c A a albino	c c A a Albino
ca	C' c A a agouti	C c a a B	c c A a albino	c c a a Albino

F2 phenotype ratio 9:3:4

9 : Agouti

3 : Black

4 : Albino.

MONDAY 14

Supplementary factors or gene.

[illegible] may be defined as two independant pairs of dominant genes, which interact in such a way that one dominant gene produces its effect whether the other is present or not, but when the second dominant gene is added to the first, a new character is expressed.

15 TUESDAY

Coat Colour in mice

Inheritance of Coat col in mice studied by Castle. B different varieties of mice ①. Agouti (grey), black and albino (white)

Agouti C is dominant to both black & albino.

Black is dominant to albino but recessive to agouti.

Albino is recessive to both agouti & black.

16 WEDNESDAY Agouti is produced by dominant gene A in the presence of another dominant gene B.

Dominant gene B alone produces black Colour.

Dominant gene A alone produces albino.

Castle crossed a homozygous black mice (BBaa) with a homozygous albino (bbAA).

The F1 individ are agouti

when the F, gouti crossed with THURSDAY 17
female agouti

Parents Black male albino female

BBaa bbAA

gametes Ba bA

F, generation BbAa

Agouti

F, individuals Agouti ♂ × A. ♀

crossed BbAa BbAq

FRIDAY 18

gametes

B.

	BA	Ba	bA	ba
BA	BBAA Aq	BBAa Aq	BbAA Aq	BbAa Aq
Ba	BBAa Aq	BBaa B	BbAa Aq	Bbaa B
bA	BbAA Aq	BbAa aq	bbAA a	bbAa a
ba	BbAa Aq	Bbaa B	bbAa a	bbaa a

9 : 3 : 4

Aq	B	1

19 SATURDAY

② Inheritance of Combs in fowls (9:3:3:1)

The interaction of two dominant genes, to control the same character was discovered by Bateson + Punnet (1908) in fowls.

They found four varieties of comb.

Rose Comb is controlled by a dominant gene R

pea is " by another dominant gene P

— The recessive alleles of the above genes in the homozygous condition (rrpp)

20 SUNDAY

produce single comb

— But when the two genes (cd) R + P are kept together they interact and produce a new comb called Walnut (similar in shape to a walnut meat).

— walnut comb is controlled by interaction two nonallelic dominant genes R and P

— the single comb is due to the interaction of two recessive genes r + P

MONDAY 21

Parent Rose comb ♂ × pea comb female

RRpp

rrPP

gamete

Rp

rP

RrPp

walnut

F1 generation

F1 fowls are crossed

walnut ♂ × walnut ♀

RrPp RrPp

	RP	Rp	rP	rp
RP	RRPP	RRPp	RrPP	RrPp
Rp	RRPp	RRpp Rose	RrPp walnut	Rrpp Rose
rP	RrPp	RrPp walnut	rrPP pea	rrPp pea
rp	RrPp	Rrpp Rose	rrPp pea	rrpp single

TUESDAY 22

9 - W

3 - Rose

3 - pea

1 - Single.