

Oklahoma School of Science and Mathematics  
Genetics  
Lecture Outline  
Exam 3

Mutations

- Forward
- Reverse
- Mutation event
- Mutation Frequency
- Point mutation
  - Base substitution
  - Base addition/deletion
    - Transition
    - Transversion

Silent

Mis-sense

- Synonymous
- Non-synonymous

Nonsense

Somatic

Germinal

Lethal

Mutagens

- Physical
- Chemical
- Biological

Cancer

- Oncogenes
- Benign
- Encased/encapsulated
- Metastasis
- Interferon
- Monoclonal antibodies

Spontaneous mutations

Induced

Tautomers

Transition

Transversion

Frame shift

Conditional mutations

Restrictive

Permissive

Biochemical mutations

Prototrophic

Auxotrophic

Deletion

Duplication

Depurination

Deamination

Oxidation

Induced

Base analogs

Alkylating agents

Intercalating agents

Base damage

Loss of function

Gain of function

Repair

Prevention of errors

Direct reversal

Alkyl transfers

Excision repair

TFIIH

Specific excision

Change in Chromosome structure

Deletion

Duplication

Inversion

Translocation

Changes in chromosomal number

Haploid

Diploid

Polyploidy

Probability of getting an even chromosome number from odd

polyploidy =  $(1/2)^{x-1}$

## Aneuploidy

2N-1

2N+1

2N-2

N+1

## Monosomics

Non-disjunction

Somatic aneuploids

Gynandromorphs

## Ecological Genetics

Natural selection

## Population Genetics

Hardy-Weinberg Law of Equilibrium

Conditions

- 1) Large population
- 2) No net mutation
- 3) No immigration no emigration
- 4) Random mating
- 5) Reproductive success

$(a+b)^2$

Gene Pool

Gene frequency

Gene drift

Population

Deme

Transient polymorphisms

Balanced polymorphisms

Natality

Mortality

Genetic Selection

Directional selection

Disruptive selection

Stabilizing selection

Net selection

Sexual selection

Intra

Inter

Species

Cline

Subspecies

Races

Allopatric

Sympatric

Reproductive isolation

Prezygotic

Habitat

Seasonal

Behavioral

Mechanical

Postzygotic

Gametic

Developmental

Hybrid inviability

Allopolyploidy

Phylogeny

Divergent evolution

Parallel evolution

Convergent evolution

Homologous structures

Analogous structures

Adaptive radiation

Darwin's Finches