

## Genetics, Biology 304 Outline of Topics/Terminology – Exam 2

The following is a list of topics and terms/concepts that have been covered during lecture and that you will be responsible for on the exams. This list is intended to help your study for the exam. However, it is NOT a complete list of everything discussed; you are responsible for everything discussed in lectures, including subjects not on this list.

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| Monoploid chromosome number                    | H-W for sex-linked genes               |
| Species that are polyploid → have larger cells | Genetic Drift                          |
| Many polyploid organisms are sterile           | Effect of population size              |
| Univalent                                      | Effect on genetic variation within     |
| Trivalent                                      | populations and between populations    |
| Allopolyploids                                 | Extinction and Fixation of alleles     |
| Autopolyploids                                 | Bottleneck                             |
| Polyloidization                                | Founder effect                         |
| Endomitosis                                    | Gene flow                              |
| Polytene chromosomes                           | Inbreeding                             |
| Aneuploidy                                     | Inbreeding coefficient (F)             |
| Trisomy  | Consequences on inbreeding             |
| Down syndrome                                  | Inbreeding depression                  |
| Nondisjunction                                 | Mechanisms of inbreeding depression    |
| Sex chromosomes                                | Outcrossing (outbreeding)              |
| Monosomy                                       | Outbreeding depression                 |
| Somatic mosaics                                | Optimal outcrossing distance           |
| Dosage compensation                            | Natural selection                      |
| Barr body                                      | Fitness                                |
| Deletion or deficiency                         | Coefficient of selection (selection    |
| Duplication                                    | coefficient)                           |
| Unequal crossing over                          | Selection for dominant vs recessive    |
| Inversions                                     | alleles                                |
| Pericentric inversions                         | Genetic load                           |
| Paracentric inversions                         | Heterozygote advantage =               |
| Inversion loop                                 | overdominance (called <i>balancing</i> |
| Balancer chromosome                            | <i>selection</i> in your textbook)     |
| Position effects                               | Heterozygote disadvantage =            |
| Heterochromatin                                | underdominance                         |
| Translocations                                 | Frequency-dependent selection          |
| Reciprocal translocation                       | Positive vs. negative frequency        |
| Cruciform pairing = quadrivalent               | dependence                             |
| Robersonian tranlocation                       | Quantitative genetics                  |
| Clines   | Normal distribution                    |
| Polymorphism vs monomorphism                   | Central Limit Theorem                  |
| Hardy-Weinberg Equilibrium                     | Properties of a Normal distribution    |
| Heterozygosity                                 | Mean and variance                      |
| Assumptions of Hard-Weinberg                   | P = G + E                              |
| Panmixia (panmictic)                           |  |

$$V_P = V_G + V_E$$

$$G = A + D + I$$

$$V_G = V_A + V_D + V_I$$

Heritability in the narrow sense ( $h^2$ )

versus broad sense ( $H^2$ )

Parent-offspring regression

Half-sib design

Quantitative trait loci

Responses to selection

Breeders' Equation,  $R = h^2 S$

Selection differential

Artificial selection

Selection plateaus

Correlated responses to selection

$r_G$

Threshold traits

Quantitative trait loci

QTL mapping