

Kentucky Class Notes

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BIO 304 Rawls
Fall 2010
Test 1

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Lecture 1 – 8/26/2010

- Chapter 1 – Genetic Approach to Biology
 - The topics covered will mostly be review or remedial material (things covered in introductory biology and cell biology).
- Types of Mutational Analysis
 - Classical or “**FORWARD GENETICS**” approach to understand gene function:
 - You select a process to analyze.
 - You collect mutations that affect your chosen process.
 - You study the mutations and the mutant phenotype to figure out the role of the genes in your chosen process.
 - You clone the gene and do your molecular analysis.
 - Basically, you see what goes wrong if a gene is removed and figure out why those things are wrong.
 - Post-genomics “**REVERSE GENETICS**”:
 - You start with sequences of an unknown gene that has an unknown function.
 - You then create mutants of the selected gene.
 - You then study the mutant phenotype to figure out the biological role of the gene.
- Most contemporary genetics are reverse genetics.
- Basically, you begin with structure and work towards function.

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- Types of Biological Variation
 - Discontinuous (qualitative) variation:
 - These variations are simple alternative forms. They are alternative **PHENOTYPES**, usually due to alternative **GENOTYPES**.
 - They are often caused by interactions of dominant and recessive alleles of genes.
 - They are common alternatives due to polymorphisms.
 - Polymorphisms are naturally occurring.
 - They are rare alternatives due to mutation (vs. wild type).
 - Ex: tall vs. short, red vs. green.
 - They are what Mendel studied.
 - Continuously variable (quantitative) traits:
 - These variations have no distinct increments and are the most common variation.
 - They are usually due to polygenes and/or significant non-genetic influence.
 - Ex: size, speed, etc.
 - They are controlled by many genes.

Figure 1-15 from the book shows a genetic “blueprint.” It shows that, irrespective of the environment, you end up with 2 distinct organisms.