

MICR 302 Review Sheet for Test 1

The first test will cover material from 'Bacteria' (Chapter 2) to 'Translation' (Chapter 7). You are responsible for **ALL** the information covered during class. Below are topics that extra focus should be placed on.

- 1) Basic genetics
 - a) Dominant and recessive alleles
 - b) Partial and co-dominance
 - c) Sex-linked traits
- 2) DNA structure
- 3) DNA Replication- all the enzymes involved and their associated activities
- 4) Transcription
 - a) Enzymes involved and their associated activities
 - b) Initiation
 - c) Elongation
 - d) Termination
 - e) Regulation
 - i) Activation
 - ii) Repression
 - iii) Global regulation
 - iv) Catabolite repression
 - v) Quorum sensing
 - vi) Antisense RNA
 - f) Operons
 - g) Differences between prokaryotes and eukaryotes
- 5) Translation
 - a) Enzymes involved and their associated activities
 - b) Initiation
 - c) Elongation
 - d) Termination
 - e) Post-Translational Regulation
 - f) Differences between prokaryotes and eukaryotes

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Review for Dr. Bender's portion of Test 2

(approximately 60 points of the 100 possible)

You will be responsible for ALL information covered in class. Below is a list of areas where extra focus should be placed.

DNA Transfer in Bacteria

- Know the differences and similarities between the three methods discussed in class
- Know the 2 possible fates of transferred DNA if it is not a replicon
- Definition of a replicon
- Differences b/w specialized and generalized transduction
- Properties of plasmids, especially the F plasmid
- Order of events during conjugation
- Generation of a Hfr strain
- Hfr transfer and order that chromosomal genes are transferred

Molecular Techniques

- Steps in isolating DNA
- Gel electrophoresis
- Restriction enzymes
 - Types
 - Recognition sites
 - Probability of cutting
 - Types of resulting ends
- Cloning genes into vectors
- Properties of vectors
- Selecting for transformants
- Selecting for recombinant vectors
- Properties of shuttle vectors and YACs

Products of Biotechnology

- Problems associated with expressing foreign genes in different organisms
- Scheme to manipulate *Zymomonas* into converting cellulose to ethanol
- Enzymes involved in cellulose degradation
- Isoenzymes versus alleles
- Scheme to prevent damage to crops by *P. syringae* and frost
- PHAs and benefit of cloning corresponding genes into a chloroplast of a crop plant
- Indigo production by *E. coli*: genes responsible and source
- Bioreactor properties
- Method for engineering bacteria capable of producing non-clumping insulin