Bio

11-1-12

Ch. 5

Mutations

- Point mutation: a single AA is changed for another (e.g. "A" ↔ "T")
- Base-pair insertion/deletion: much more lethal!; addition or removal of an AA; which messes up the proofreading process
  - ea. type caused by chemical or radiation exposure, or just mistakes in DNA copying
- Nuclear Power Plants not as dangerous as believed to be
- Mutations ≈ 1000/min (usually not harmful); usually in junk DNA (non-coding DNA)
  - mutations in gametes (much more dangerous)
    - can be passed on to offspring
- Most genetic diseases are mutations creating enzymes that don't function as intended

DNA

- 2 kinds:

Mitochondrial (m/mtDNA) ○	Nuclear (nDNA) ~
100's copies/cell	1 copy/cell
100% from mother	½ from ea. parent
circular	Long threads
15,000 base pairs	3 billion base-pairs
runs powerplants	builds + runs you

- Use?

determine lineage/mother	ID the individual
ID/species	ID father/evolutionary relatives
	drug effectiveness
	genetic disease screening

Biotechnology

- the use of tech. to modify organisms, cells & molecules by adding/deleting or transplanting genes among organisms
- Advances have 3 categories:
  - disease treatment
  - disease prevention/curing
  - altering Ag products

- 5 steps to biotechnology
  1) Chop DNA
  2) Amplify DNA (into larger quantities)
  3) Insert diff. DNA species into bacteria
  4) Grow bacteria
  5) ID the bacterial colonies

- Development of insulin-producing bacteria became
  - Human growth hormone (HGH)
  - Erythropoietin

- Curing diseases w/ biotech: gene therapy & correction of malfunctioning gene
  - Difficulty getting the working gene into specific cells where needed.
  - Difficulty w/ getting into enough cells

- Ethical Dilemmas
  - Discrimination, health Ins., etc.