

## Ch 20 Biotechnology

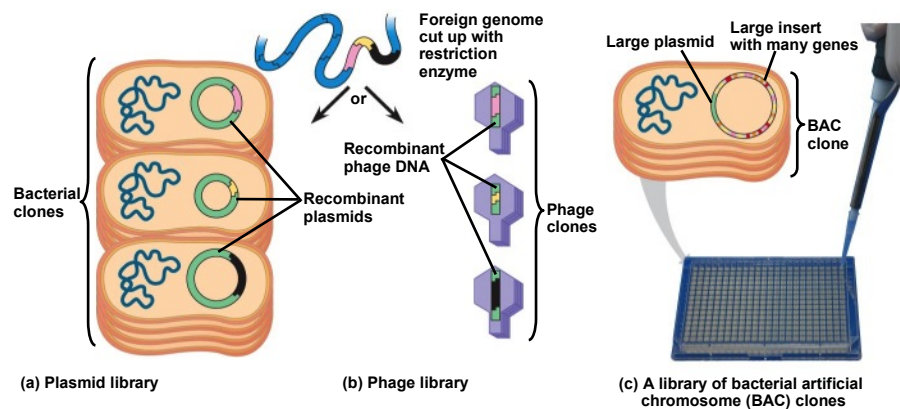
### A. Bacteria

- a. Restriction enzymes (palindromes)
- b. Plasmids : supplemental extra chromosomal
- c. Recombinants : use same restriction enzymes to cut desired gene from host and insert into a vector that was cut with the same restrictions enzymes
  - i. Sticky ends match up
- d. Transformation
  - i. Change the phenotype of an organism by inserting foreign DNA

### B. Sorting DNA

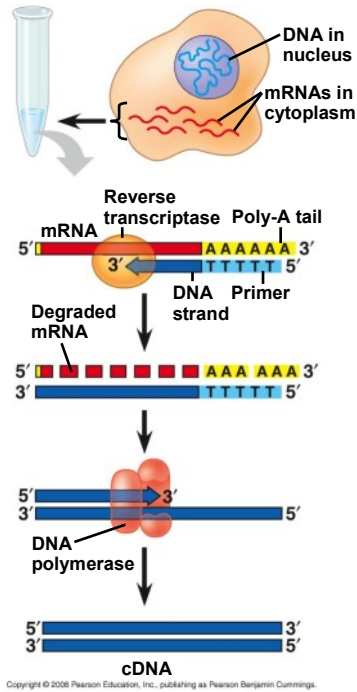
#### a. Genomic libraries

Fig. 20-5



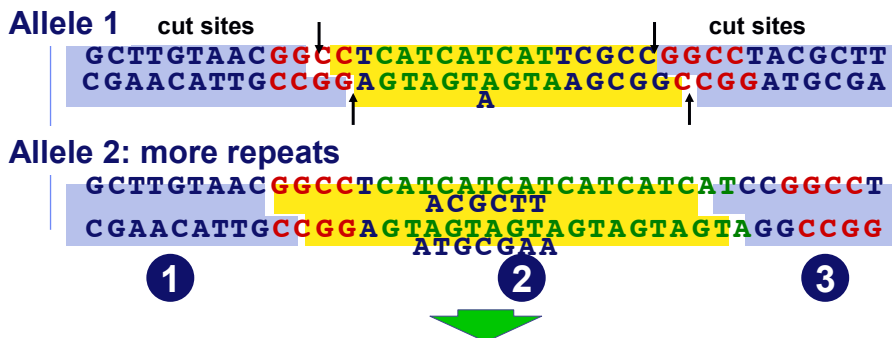
- b. cDNA libraries: use reverse transcriptase to make DNA from mRNA
  - i. no introns

Fig. 20-6-5

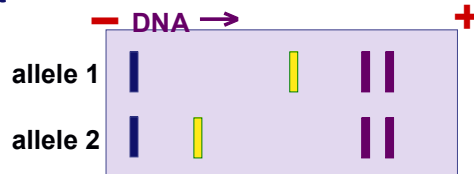


- C. Analyzing DNA sequence for identification purposes: use variable regions of DNA
- Relatedness (INTRONS)
  - Diseased allele (EXONS)

## Differences between people



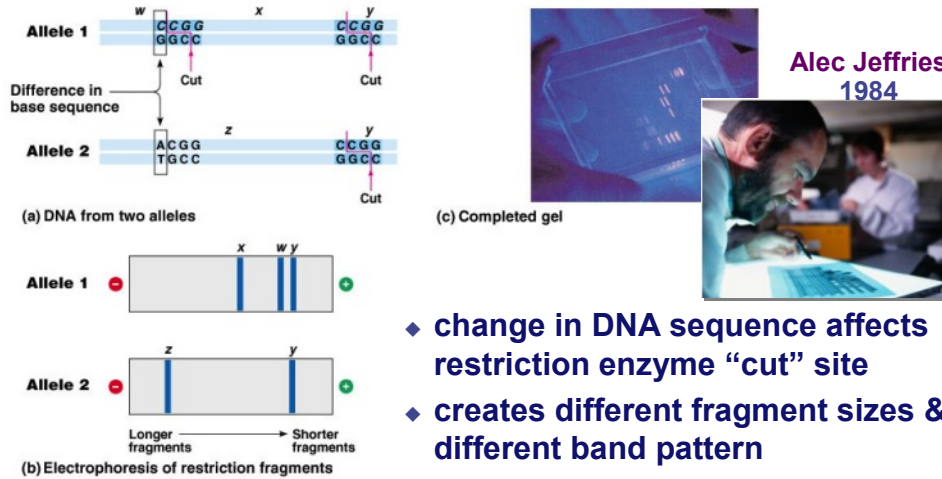
### DNA fingerprint



# RFLPs

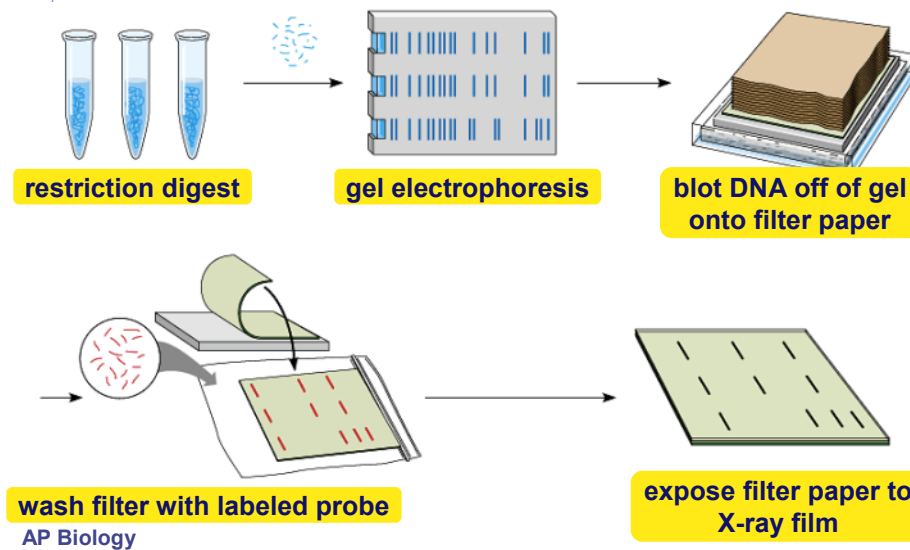
## Restriction Fragment Length Polymorphism

◆ differences in DNA between individuals



If use RFLP old school, have to do SOUTHERN BLOTTING to ID a specific sequence/allele  
 Run gel and blot onto paper then place in bath with probes: DNA HYBRIDIZATION

# Southern blotting



RFLP and VNTR : Variable Number Tandem repeats are OLD SCHOOL  
 Cut up all the DNA and then make probes for specific variable regions

Probes have certain VARIABILITY in the population

Ex. 1 in 10 or 1 in 100

Forensics: crime scene

Use a combination of probes in order to prove no one else in the city, state, country or world could have the same DNA

STR: SHORT TANDEM REPEAT POLYMORPHISM NEW SCHOOL

[http://www.biology.arizona.edu/human\\_bio/activities/blackett2/overview.html](http://www.biology.arizona.edu/human_bio/activities/blackett2/overview.html)

2 to 5 nt repeated sections are highly variable: POLYMORPHIC

Ex. Individual 1 : 18 repeats at a locus and another 30

PCR STR and run on a gel

PCR: hi heat = denature, med = dNTP, Taq polymerase REPEAT

DO NOT NEED PROBES

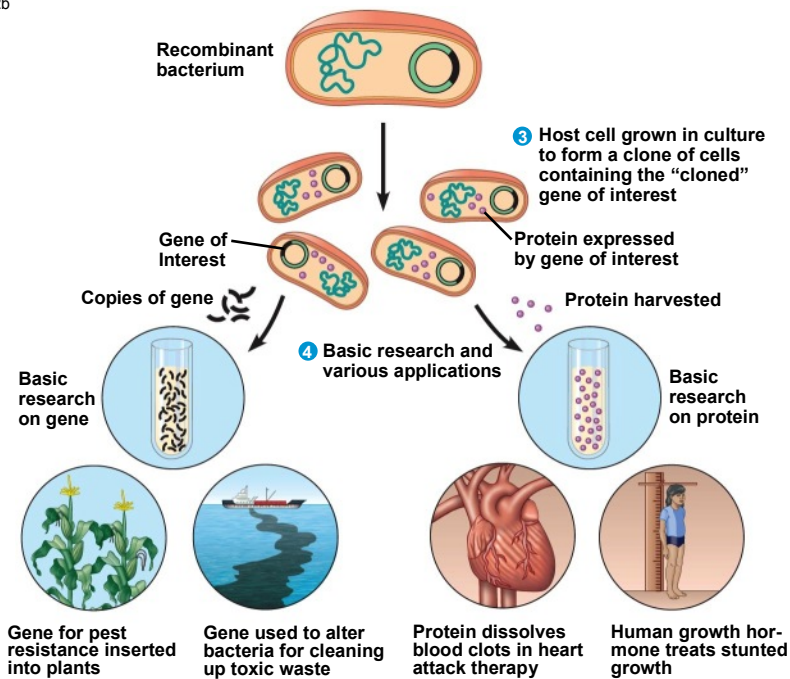
do not need to do Southern Blotting (faster, cheaper)

D. Finding a gene of interest in a library or patient

- a. Use a single stranded nucleic acid probe in a library or southern blotting technique

E. Engineering

Fig. 20-2b



F.