Biological Frameworks for Engineers ME 411 / 511

ME 411 / ME 511

Biological Frameworks for Engineers

UNIVERSITY OF WASHINGTON

Class Organization

- Lab 1 worksheet due Mon,10/15
- Lab 2 – Lab-on-a-Chip
  - Wed, More 320

Biological Frameworks for Engineers

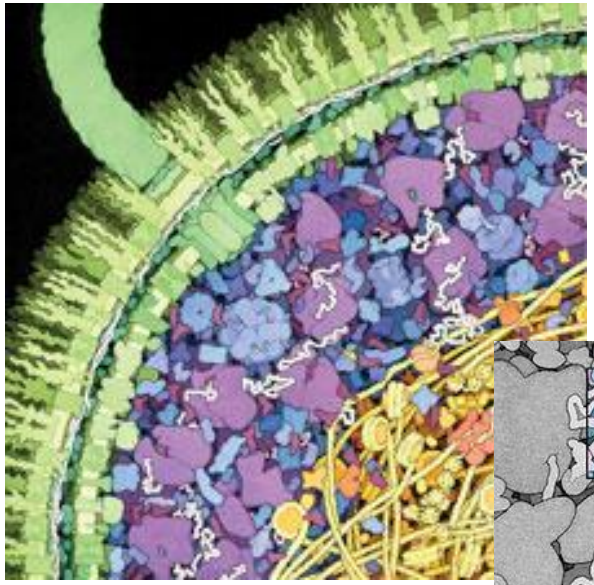
ME 411 / 511

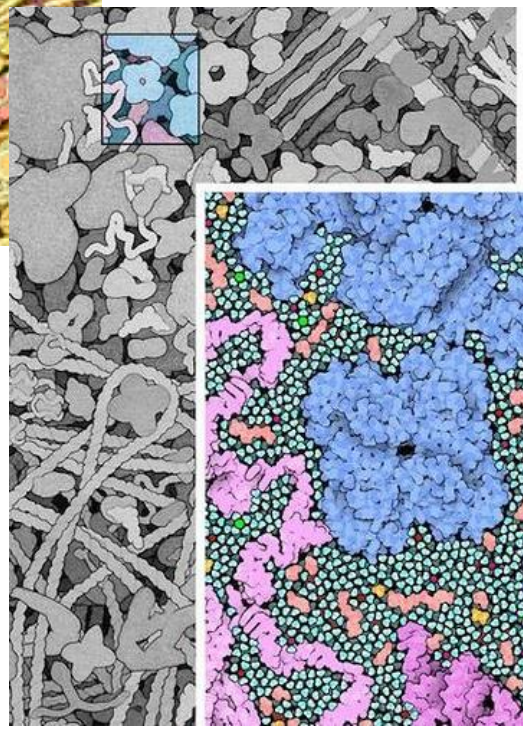
ME 411 / ME 511

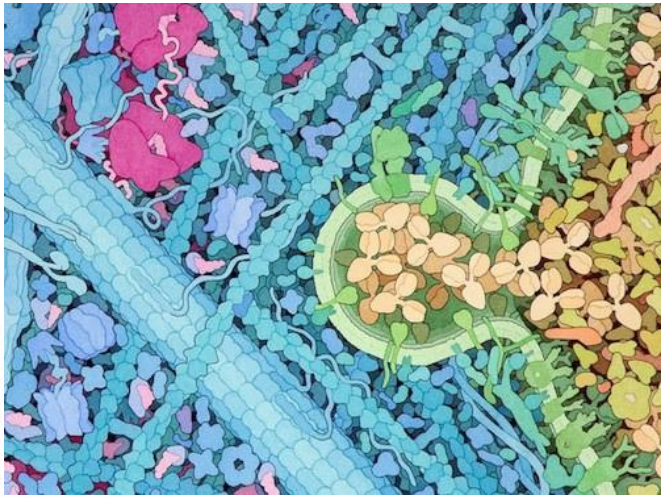
Decoding Proteins and Protein Functions

UNIVERSITY OF WASHINGTON

A cell is a crowded place…







Protein Purification

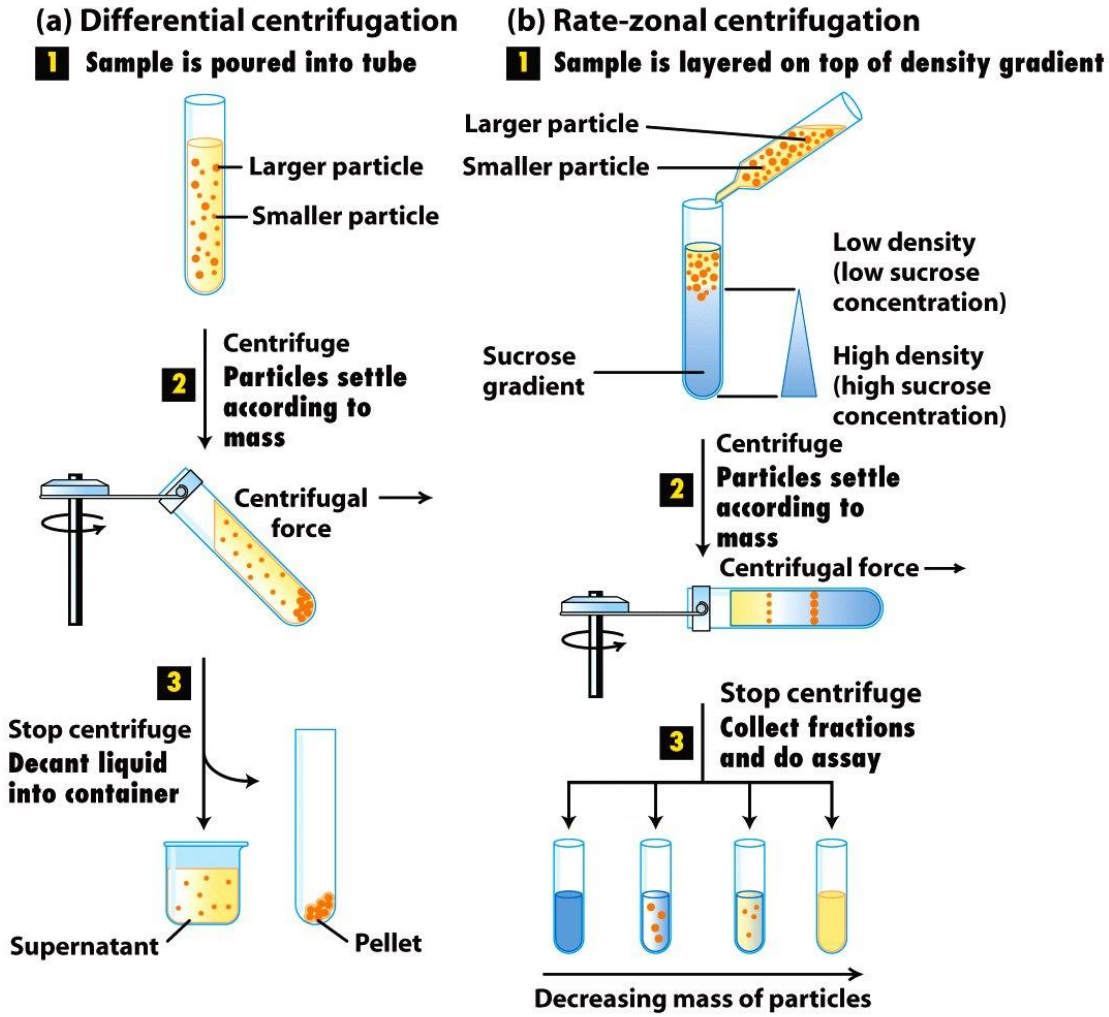


Figure 3-34
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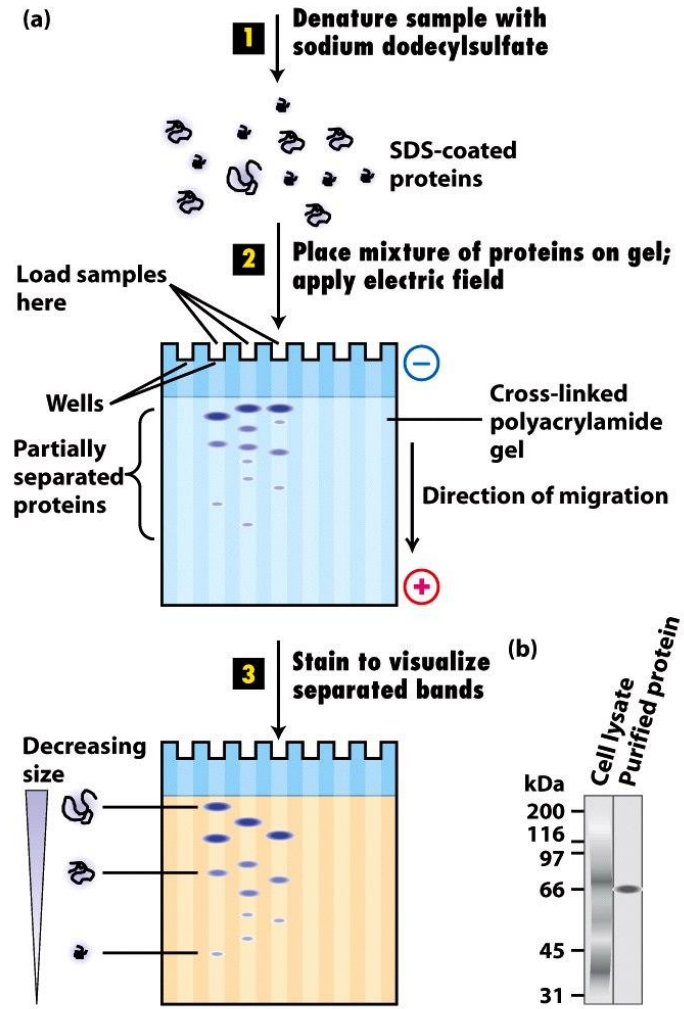
Gel Electrophoresis

- Separation by charge-to-mass ratio
- Small proteins migrate faster than large ones
- SDS-PAGE
  - Sodium dodecylsulfate
  - Polyacrylamide Gel Electrophoresis



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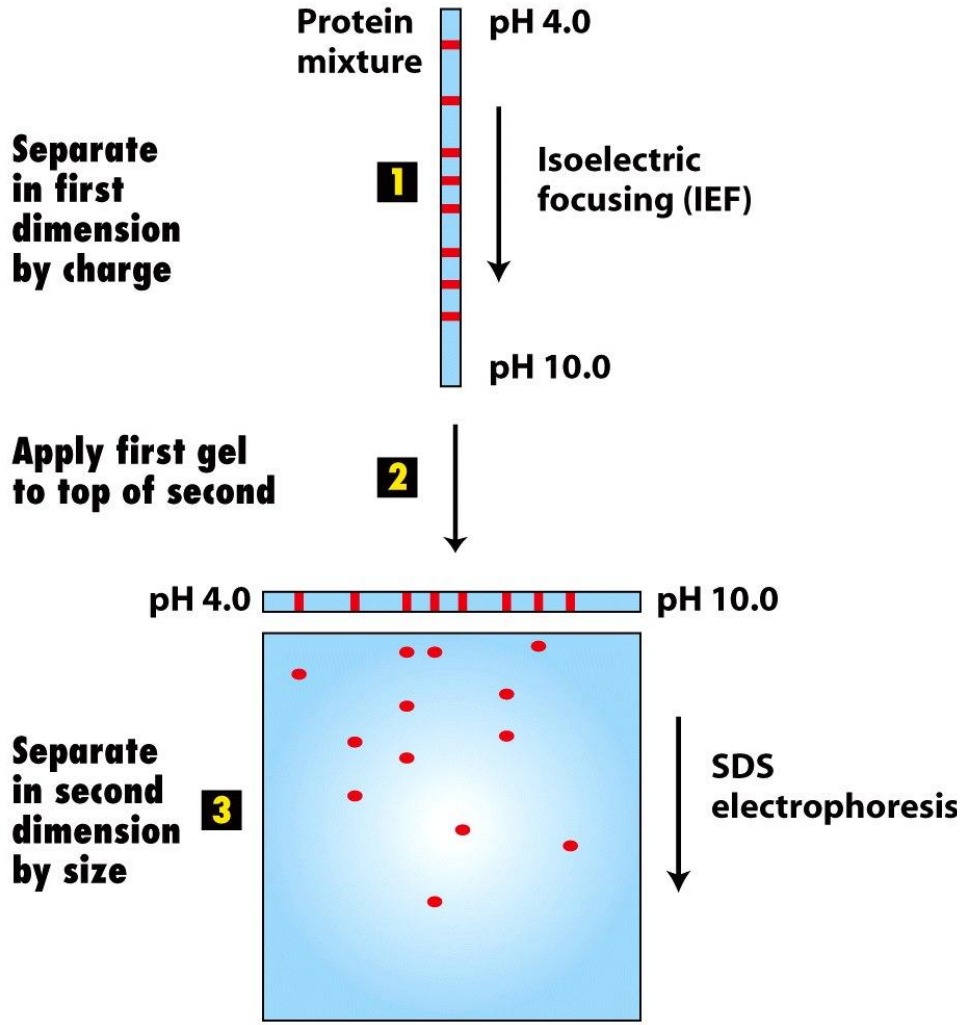
2-D Gel Electrophoresis



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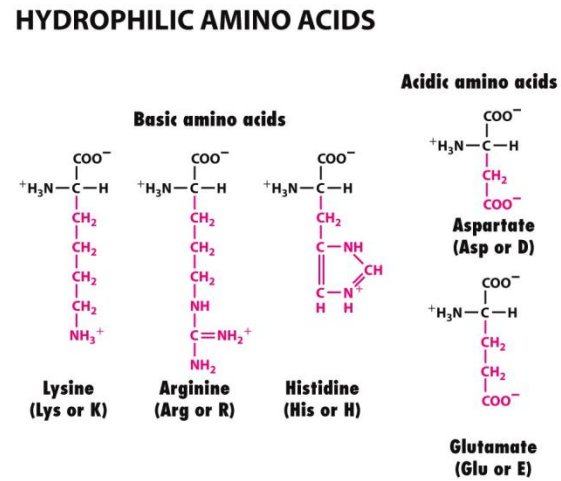

Figure 2-14 part 2
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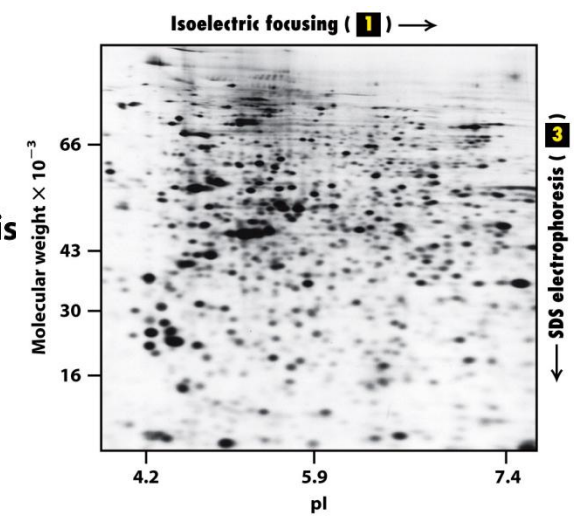

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TY OF
GTON

Chromatography

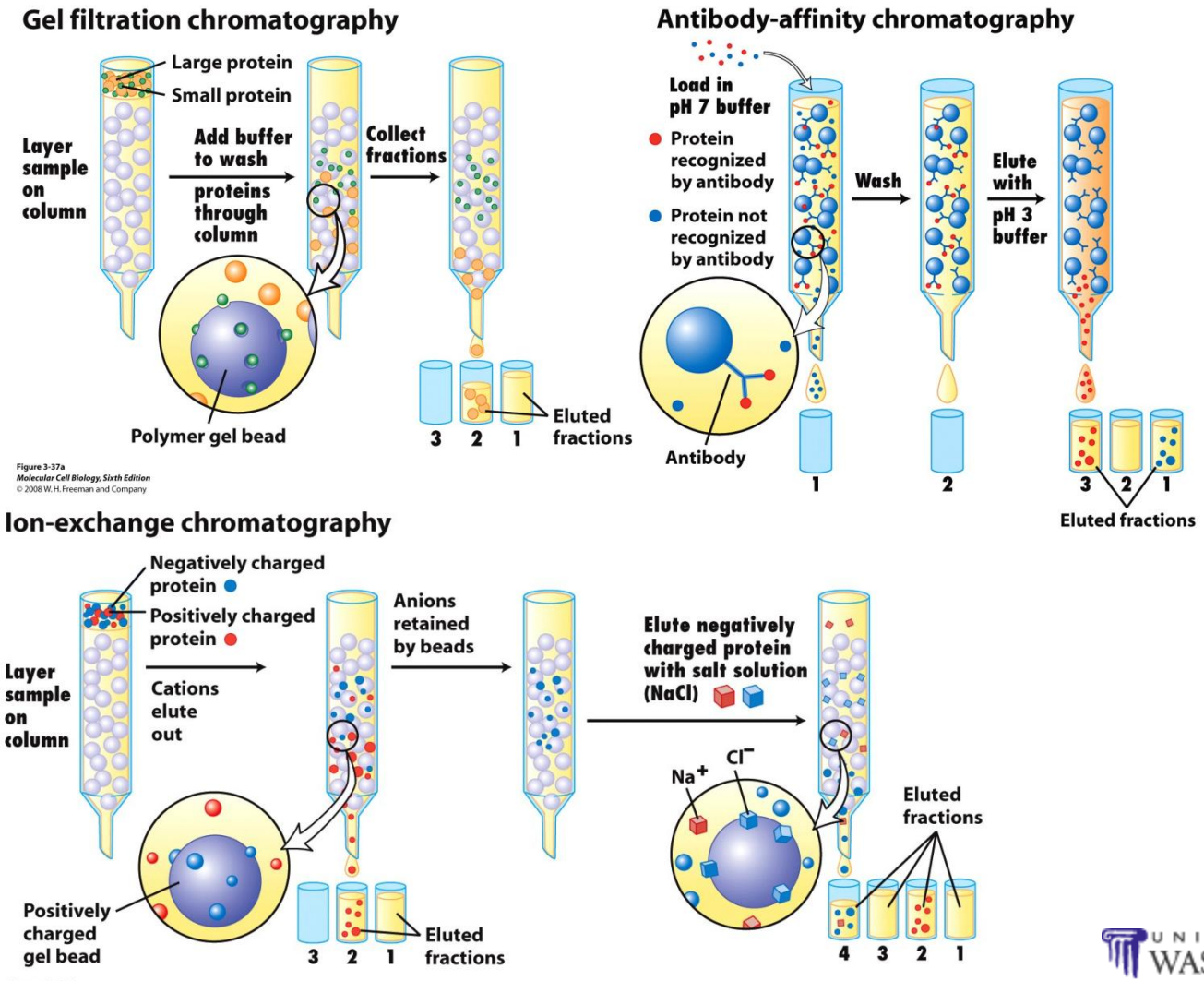

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Figure 3-37b
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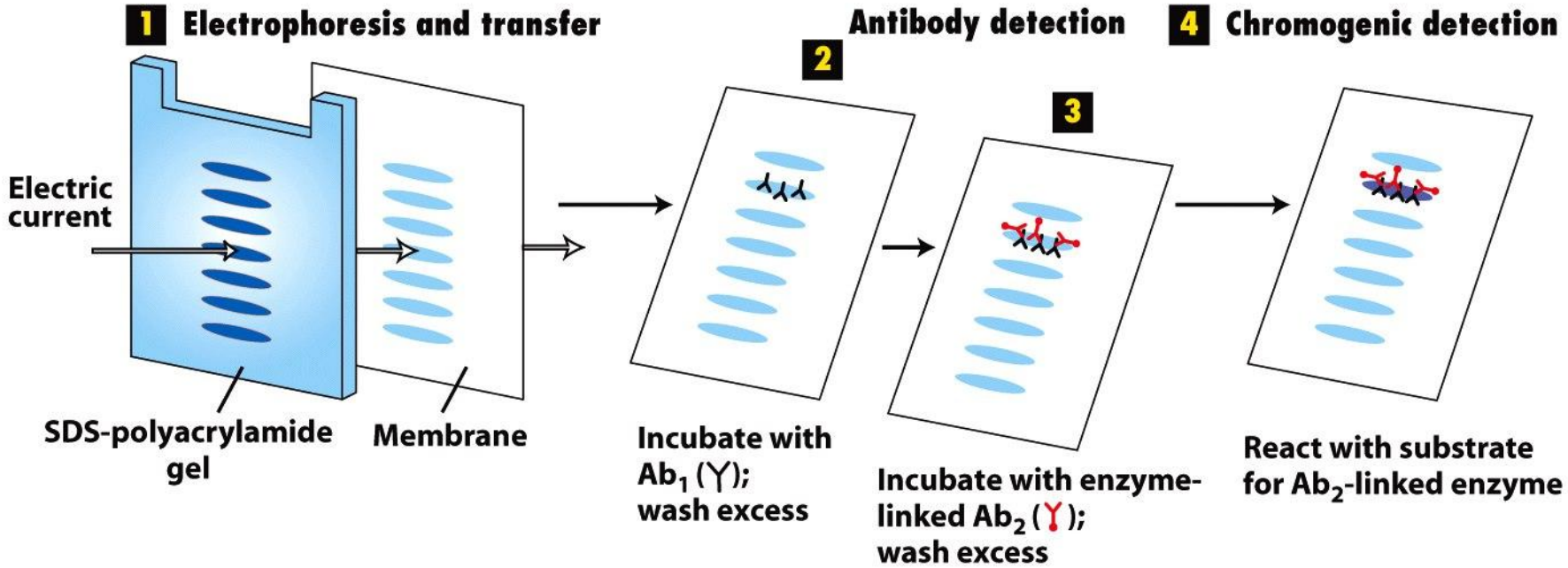
Western Blot



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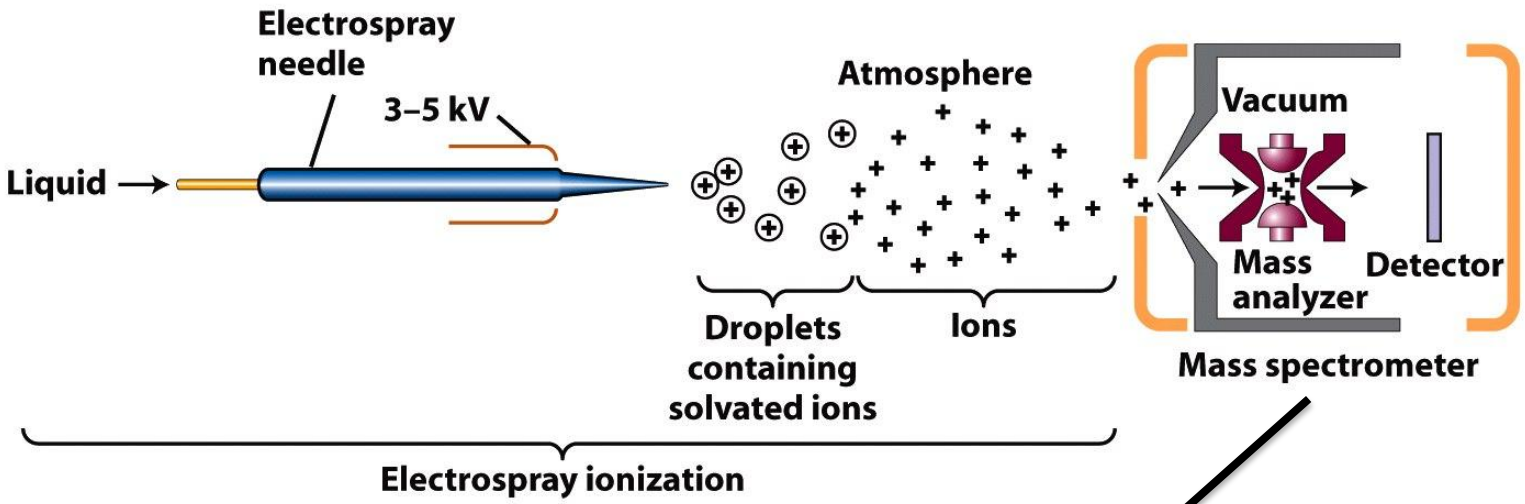
Mass Spectrometry



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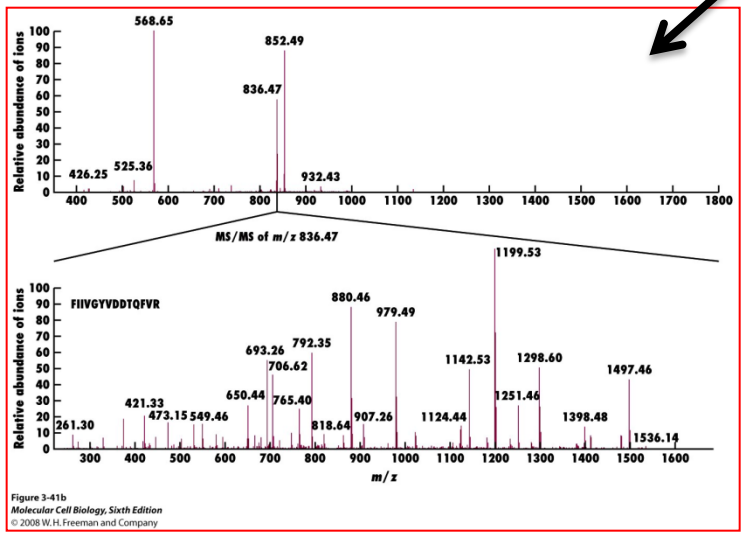
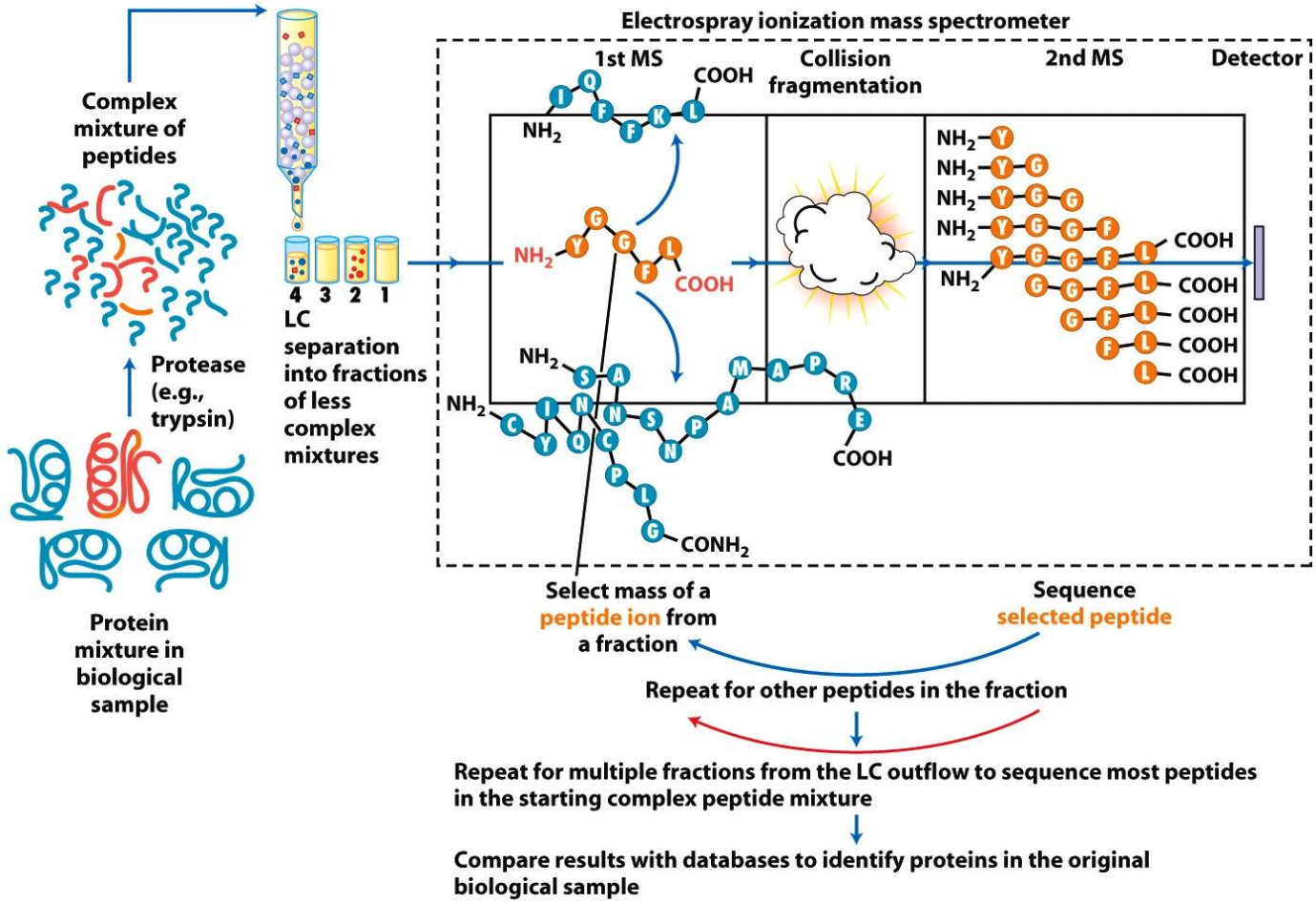


All together now…



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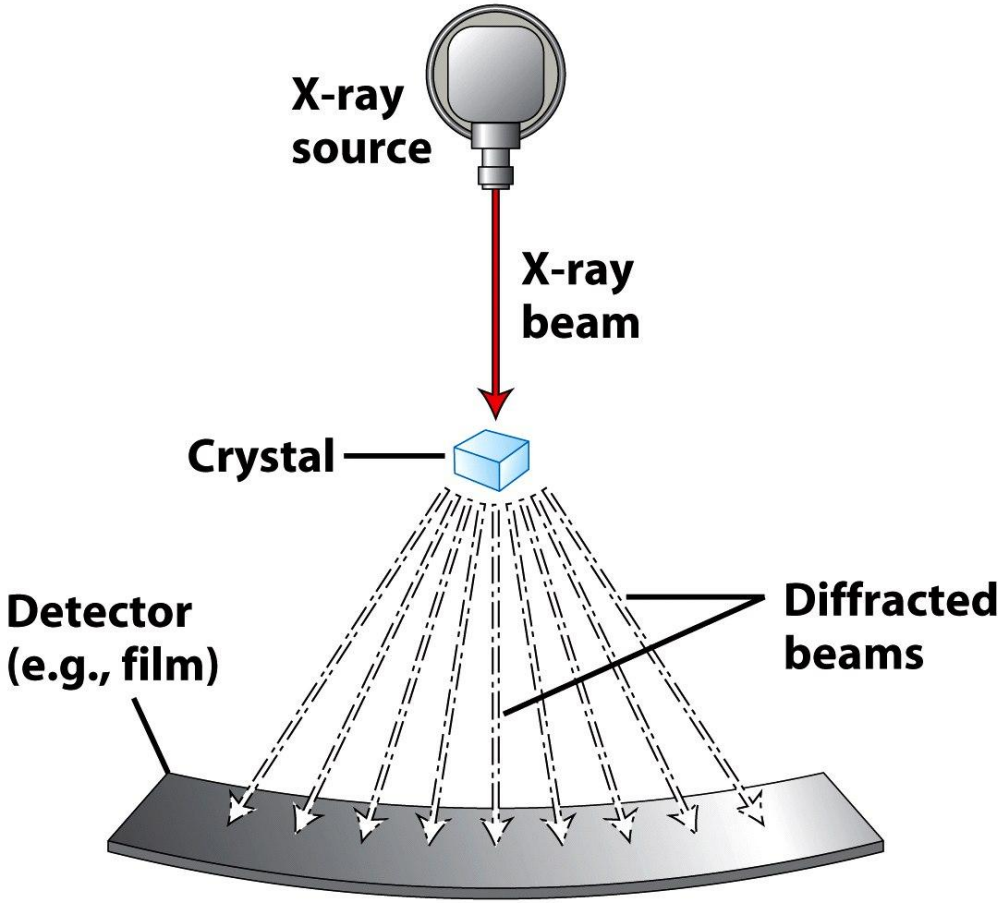
X-Ray Crystalography



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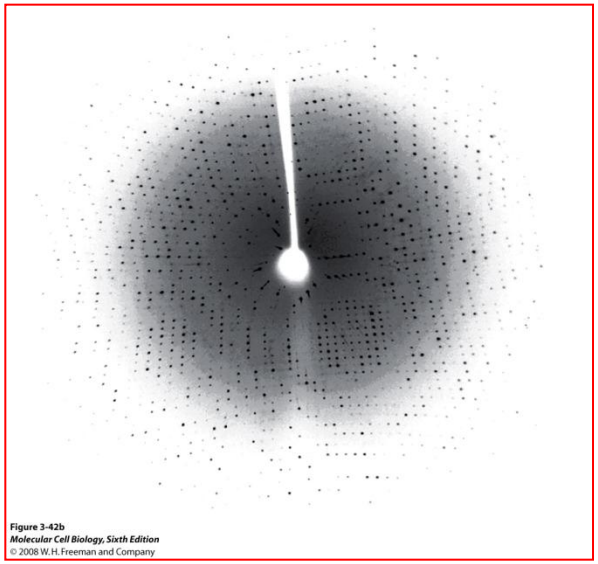

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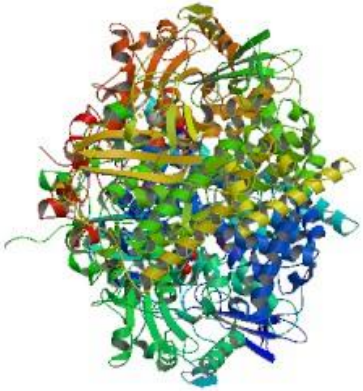
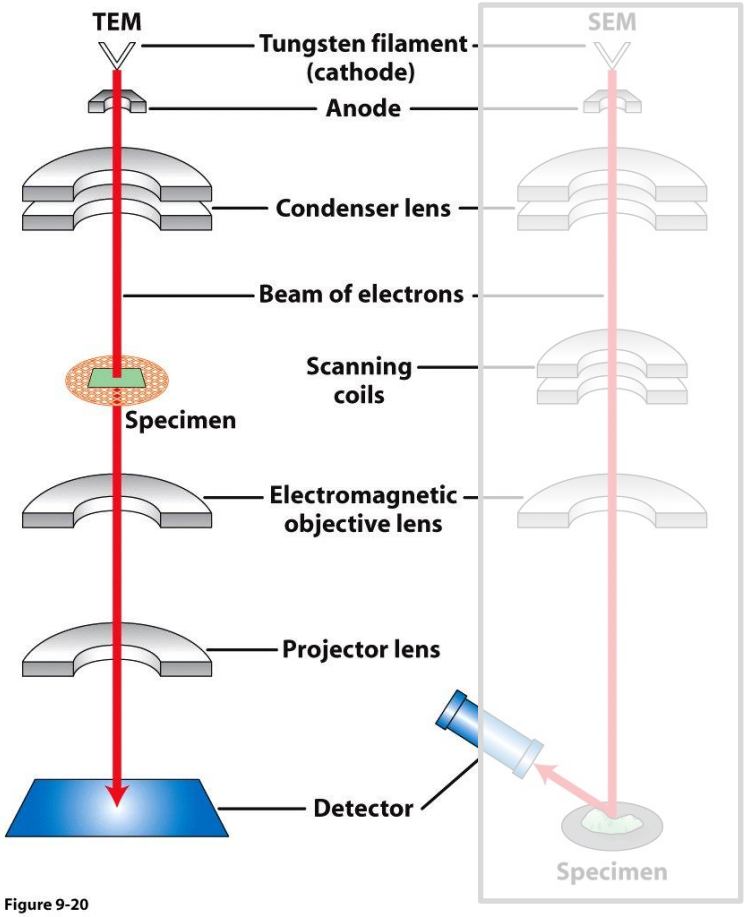


Cryo-EM



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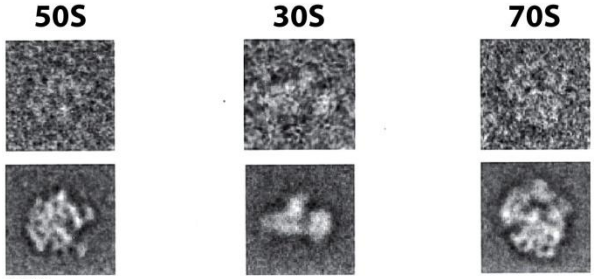

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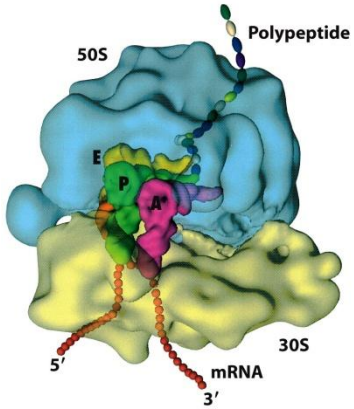

Figure 4-26b
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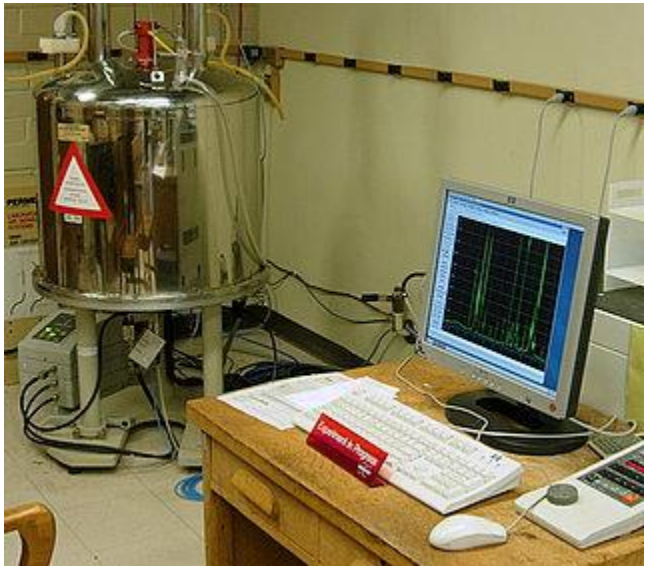
E. coli Ribosome

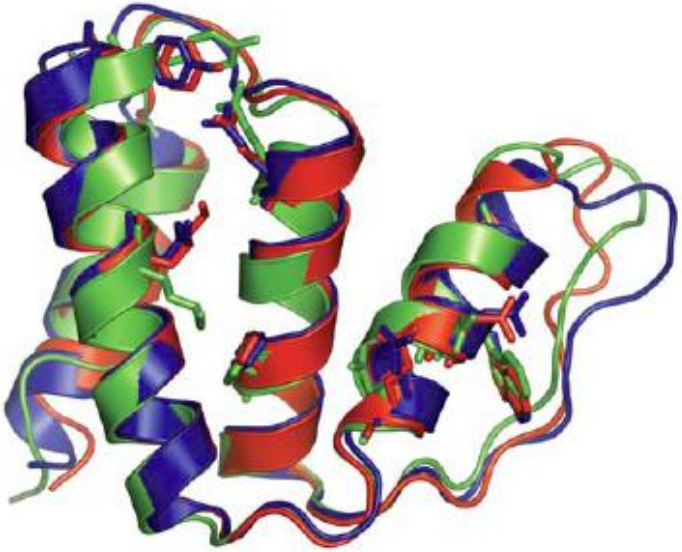
NMR Spectroscopy



David Baker, Howard Hughes Institute, University of Washington.

Decoding proteins

TeraGrid 2007



Protein structure prediction by the Rosetta code, showing the unknown structure (blue), the X-ray structure (red, unknown when the prediction was calculated), and a low-resolution NMR structure (green).

Image courtesy of Ross Walker, SDSC, and Srivatsan Raman, University of Washington.

Protein Function

- Pharmacological inhibitors
- Recombinant DNA
- Knock-out mice
- RNA Interference

Questions ?