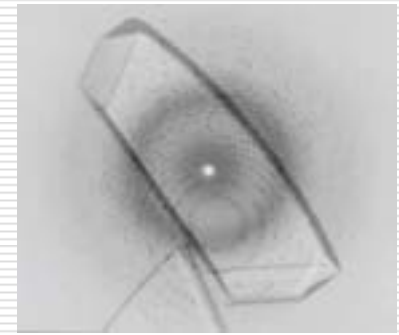


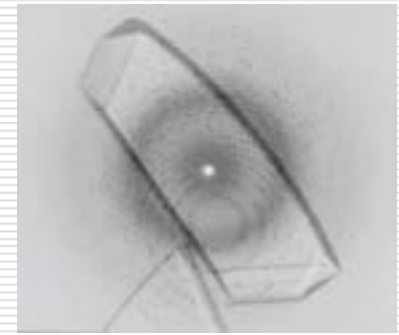
Enzyme Characterization



Why we need to characterize an enzyme?

- ❑ To understand function we need a structure
 - ❖ To fix a car we need a manual
- ❑ To get structure we need to “look” at the molecule
 - ❖ Molecules are too tiny to be seen by microscopes
- ❑ To “see” we need many molecules stuck together
 - ❖ Crystal is molecules stuck together in a periodic way
- ❑ Still it is hard to “look” at the crystals
 - ❖ So we use x-rays since they have short wavelengths

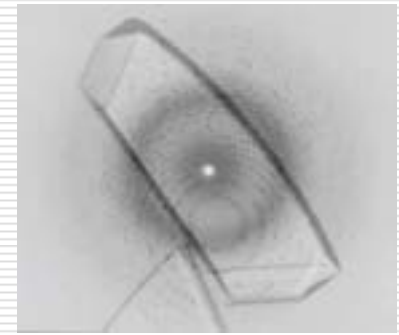
Enzyme Characterization



Why we need to know function?

- To benefit
 - ❖ We can make use of the function to our for advantage
 - ❖ Blaber lab works on Vitamin C synthetic pathway
- To avoid problems
 - ❖ We can stop the function if it is harmful
 - ❖ Li lab work on Cbf5 protein

Enzyme Characterization



Why we need to know structure?

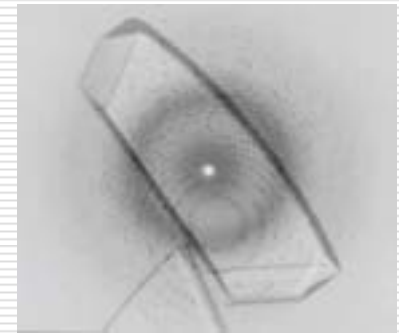
□ With structure

- ❖ Know how it works >>> The mechanism
- ❖ Make it efficient >>> Better product
- ❖ Make it economical >>> Save money or resources

□ Without structure

- ❖ Conduct lots of biochemical experiments
- ❖ Carry out lots of biophysical studies
- ❖ Still guess the mechanism >>> No easy solution

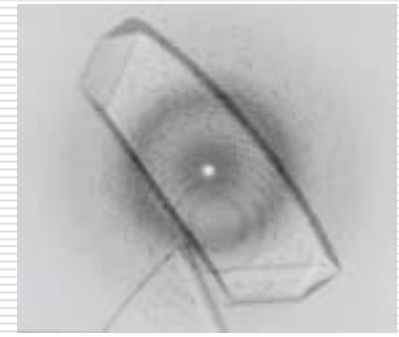
Enzyme Characterization



Why we need a crystal?

- Molecules are too tiny to see
 - ❖ Random molecules don't give enough information
 - ❖ We need many molecules stuck together
 - ❖ Regularly arranged molecules give more information
 - ❖ Crystals are regularly arranged molecules
 - ❖ So we need crystals

Enzyme Characterization



Why we need x-rays?

- Molecules inside crystals are still too small to see
 - ❖ We need a probe the size of the molecule
 - ❖ Molecular sizes are 1/10 of nanometer
 - ❖ X-rays have wavelength in that range
 - ❖ So we use x-rays to “see” molecules