

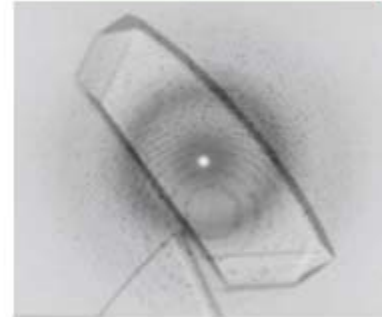


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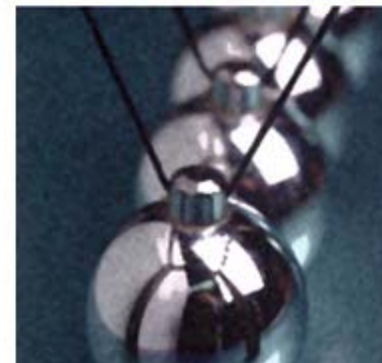


Crystal Characterization

Enzyme Crystallization & Diffraction



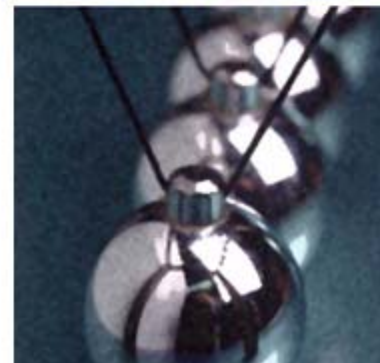
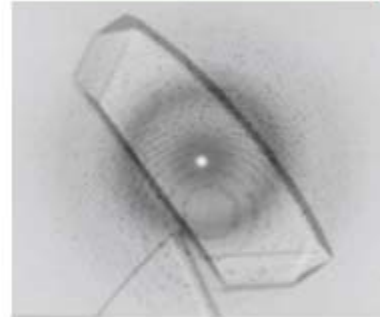
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Overview

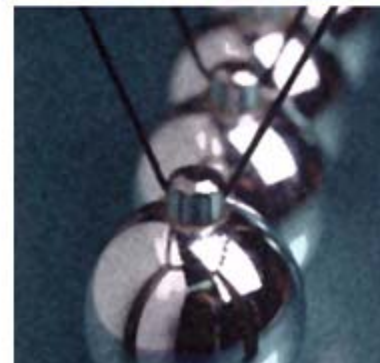
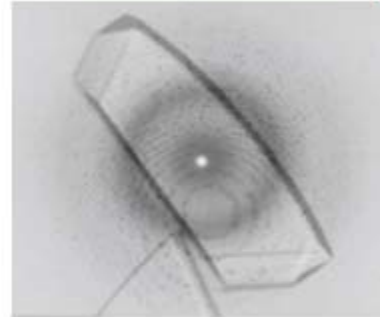
- Project Description
 - Objectives
- Project Methodology
 - Crystal Growth & Characterization
- Key Findings / Results
 - Findings
 - Results
- Conclusion



Project Description

Objective

- *Learn to handle biological samples*
- *Grow enzyme crystals*
- *Optically characterize crystals*
- *Vary growth conditions*
- *Flash-cool crystals*
- *Diffract crystals using x-rays*
- *Record and analyze results*



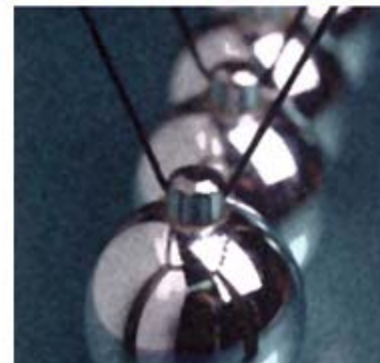
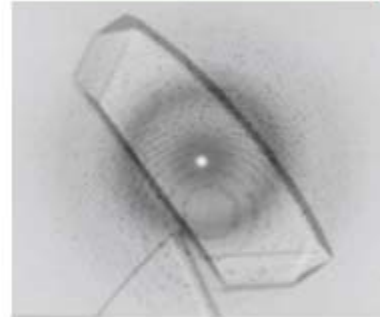


Procedures

- Prepare enzyme solutions
- Prepare crystal plates
- Observe crystals under microscope
- Vary concentration and drop size
- Record results
- Flash-cool crystals in liquid nitrogen
- Diffract crystals with x-ray radiation

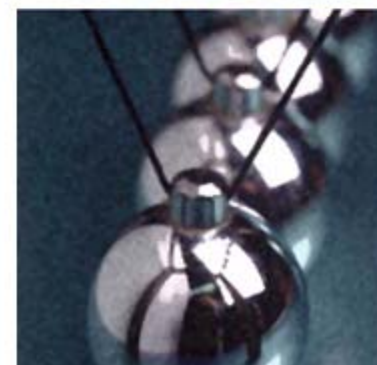
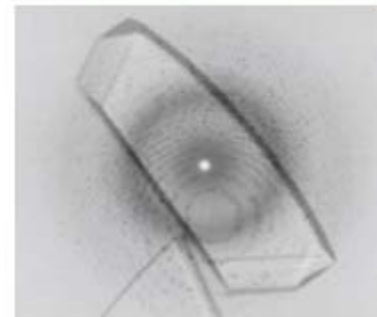
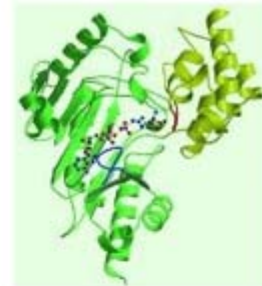
Key Assumptions

- *Crystal quality changes with conditions*



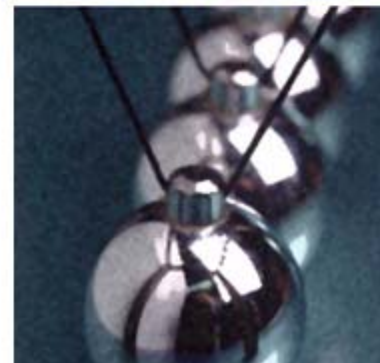
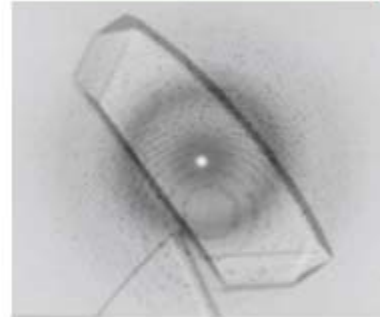
Procedure: Enzyme Preparation

- Learn to handle biological samples
- Prepare buffer solutions
- Weigh correct amount of enzyme
- Dissolve enzyme in buffer solution



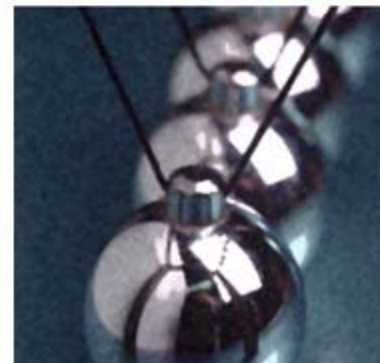
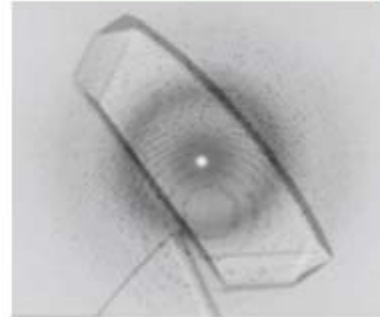
Procedure: Crystal Plate

- “Grease” crystal plates
- Clean the cover slips
- Dispense well solutions
- Dispense enzyme on cover slips
- Set-up the cover slips
- Store at appropriate temperature



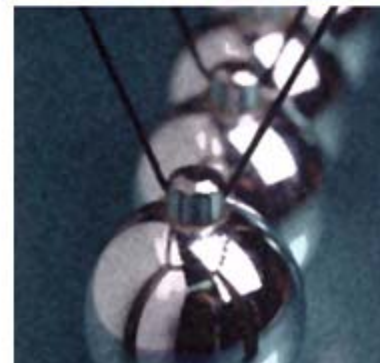
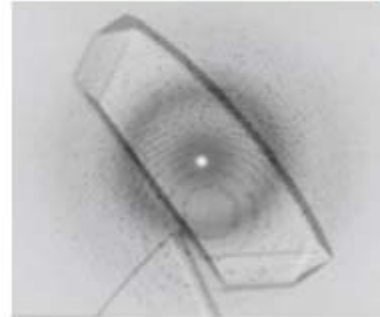
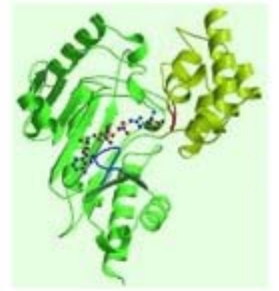
Procedure: Observation

- Examine wells under microscope
- Record “clear” and “crystal” conditions
- Capture images of crystals
- Modify conditions
- Set-up next batch of plates
- Store at appropriate temperature



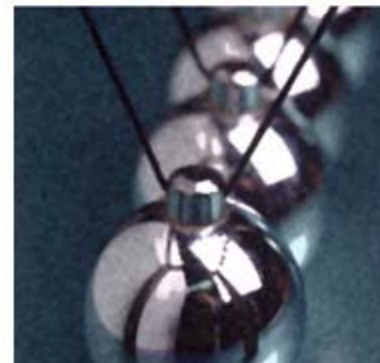
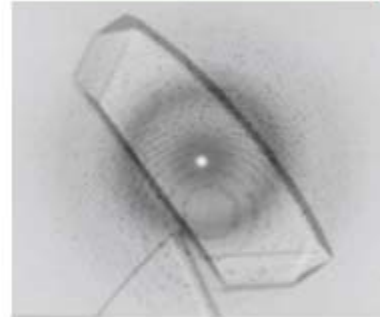
Procedure: Flash-Cool

- Learn about cryo conditions
- Safe handling of liquid nitrogen
- Retrieve a good crystal
- Flash-cool with liquid/gas nitrogen
- Store at cryo temperature

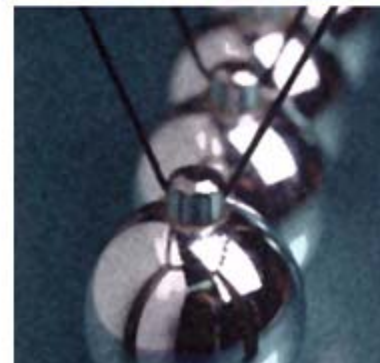
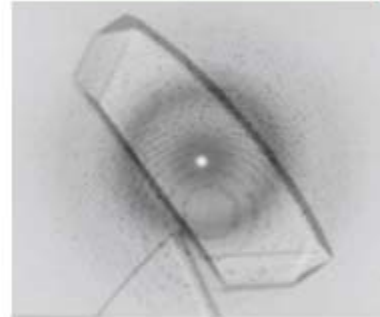


Procedure: Diffraction

- Learn about diffraction
- Safety of x-ray radiation
- Mount a good crystal
- Record a diffraction pattern
- Analyze and note the results



Conclusion



Questions & Discussion

