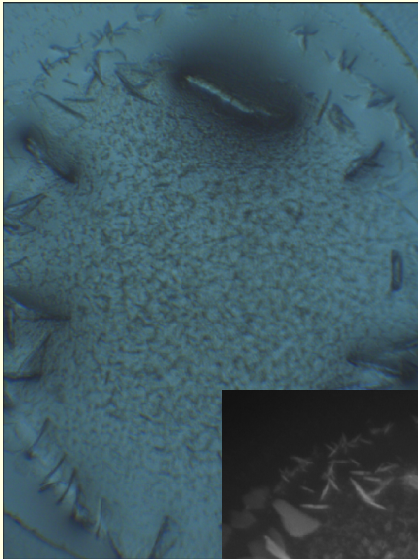


# PRS-1000 Protein Review Station

## FOR X-RAY CRYSTALLOGRAPHY

### STREAMLINING THE TASK OF IDENTIFYING PROTEIN CRYSTALS



### Korima's Breakthrough Technology Revolutionizes Protein Crystal Recognition

- **Fail-safe protein crystal identification**  
Every time—in every sample
- **Fits easily on a lab bench**
- **Quick to set up**
- **Easy to operate**
- **Portable**

Traditionally, X-ray crystallographers have faced a truly daunting challenge—that of scanning hundreds of potentially successful images for protein crystal growth.

Even though microplates of buffer solutions could be teeming with critical protein crystals, target proteins often could go undetected among strong salt growth and other debris.

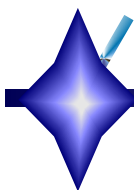
Experience, of course, would help a crystallographer discern target proteins. But with so many decoys appearing in countless shapes and sizes, it often took a measure of sheer luck to pick out the crystals that really counted.

### ENTER THE PRS-1000

The PRS-1000 Protein Review Station instantly revolutionizes the entire protein recognition process.

Under Korima's exclusive, patent-pending split fluorescent beam, target proteins—and only target proteins—respond selectively to fluorescent excitation.

With the PRS-1000, you will instantly recognize protein crystals. All of them—in every solution. Eliminating guesswork. Saving time. Slashing costs.



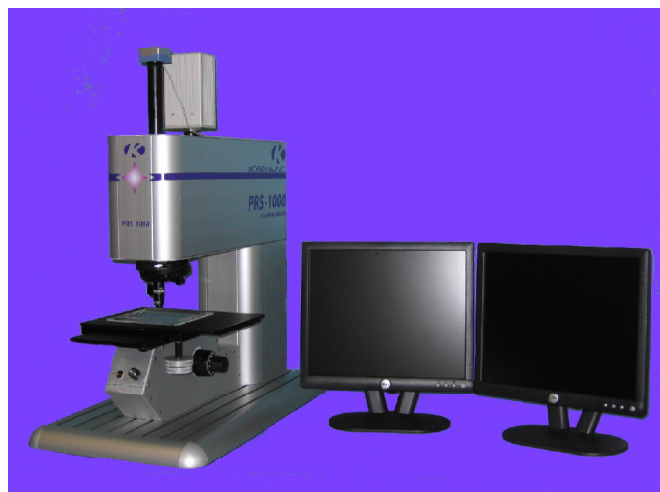
## PRS-1000 Features and Specifications

### Breakthrough Technology that Fits on a Lab Bench!

The PRS-1000 makes a major difference in any pharmaceutical or research lab, but does so with a small footprint.

Fitting easily on a standard lab bench, the complete system comprises all necessary components, including microscope, dual cameras and monitors, lights, and power supplies.

- **LCD Monitors.** Two 17-inch LCD monitors display samples simultaneously under ultra-violet and visible light.
- **Microscope and Objectives.** Turret-mounted 5x, 10x, and 20x UV/Visible objectives enable complete cell coverage or close inspection of individual proteins.
- **PC and Software.** The latest Intel-powered, Windows-based PC and proprietary software stand at the heart of the system.



**The PRS-1000 Workstation fits easily  
on a lab bench.**

- **Lights and Cameras.** Visible and shutter-controlled DUV cameras capture the effects of high-contrast visible and ultra-violet lighting.
- **X-Y Platform.** The system's standard X-Y platform allows precise, systematic examination of samples in a 96-well Limbro plate or any standard microplate.

**An optional, motorized X-Y table,** which allows automated archiving, is also available.



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## **Howard Hughes Medical Institute Justification: PRS-1000**

### **Equipment Justification for a KORIMA PRS-1000 Microscope**

In our effort to streamline the painstaking process of evaluating protein crystals, the most critical requirement will be the acquisition of a PRS-1000 Digital Deep Ultraviolet Protein Review System microscope. One of the most arduous steps in macromolecular crystallography is to distinguish whether visible crystals represent the protein we seek, or salt crystals from the precipitant and buffers. Even for an expert scientist, the laborious task of selecting a single crystal, mounting it on a capillary or cryo-loop, and capturing several diffraction images to determine whether the sample is a macromolecule or a salt, requires about 20 minutes.

Attempting to reduce the time necessary to evaluate each sample, we tested a PRS-1000 UV microscope for three weeks in Dr. Eisenberg's lab. Developed by Korima Inc., the microscope uses specialized optics to identify and distinguish protein crystals. Using the PRS-1000, we conducted exhaustive tests with about 20 different proteins, or about 200 crystallization trials. In a matter of less than 15 minutes, the PRS-1000 scanned a 96-well crystallization plate and, with 100% accuracy, easily differentiated protein from crystals. Using our current technology with an equivalent array of samples, the same task would require more than a week. With the PRS-100, all negative results proved to be salt—not protein. Additionally, the microscope allowed us to identify protein micro-crystals invisible under an ordinary light microscope. The identification of these small crystals is an important step in optimizing crystallization conditions for obtaining diffraction quality crystals.

While reducing the time required to identify protein crystals from hours to seconds, the easy-to-use PRS-1000 provides a definitive visual indication of the overall crystal growth.

The PRS-1000 from Korima is currently the only commercial microscope available with a deep ultraviolet epi illuminating excitation channel, in combination with a near ultraviolet CCD viewing channel. Additionally, and exclusive to the PRS-1000, is the simultaneous dual viewing imagery of the protein crystals in transmitted visible light. In combination with their near ultraviolet tail fluorescence, this produces an instantaneous analysis of the crystal growth. For this reason, the PRS-1000 Microscope is an essential instrument for all protein crystal growth labs and facilities.

Although numerous epi fluorescence microscopes are available, all but the PRS-1000 utilize visible optics and visible fluorescence. For that reason, those other instruments can be excited by either near ultraviolet with wavelengths as short as 360nm or longer, in conjunction with a wide variety of dyes. Many of the dyes and special chemistries can be excited with visible illumination also; for example, FITC excites at 480nm and emits at 520nm. The natural or native absorption of protein crystals occurs well below the transmission capabilities of optical glass. The excitation wavelength, which requires the use of specialized optical components and filtering that is unique to the PRS-1000, is not

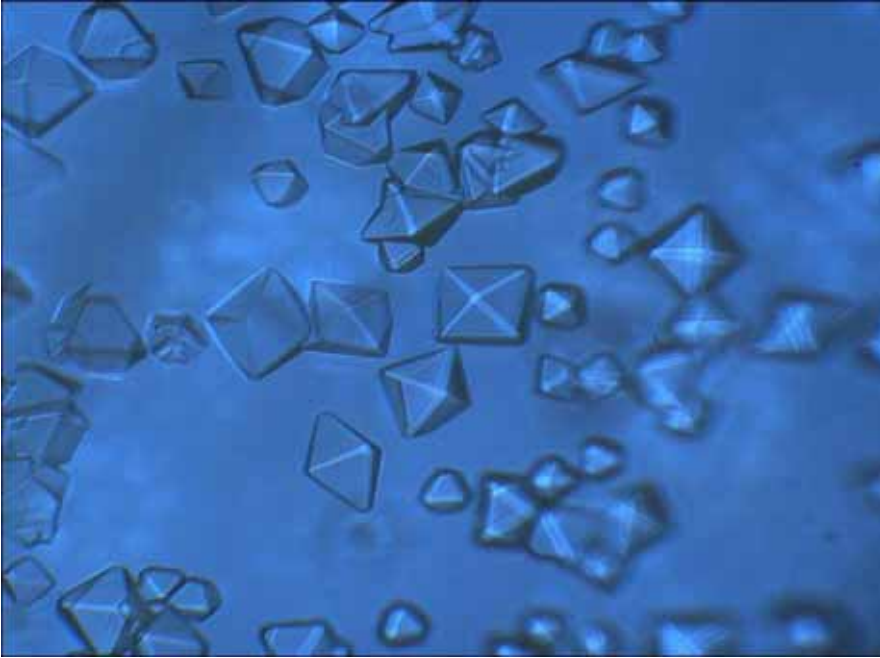
commercially available in other fluorescence microscopes. This aspect, along with the near UV viewing with the CCD and simultaneous presentation of the visible transmitted light, image positions the PRS-1000 as the only commercial microscope available with features necessary to view and instantly evaluate protein crystals. The laboratory's research capabilities will improve significantly through the procurement of the PRS-1000 microscope.

**Testimony:**

A PRS-1000 user says:

“ After testing the PRS-1000 with several samples, we confirmed 2 microcrystals as protein, which we might not have pursued if we didn't use the PRS-1000. We also confirmed one protein for which we found crystals in two new conditions that we hadn't noticed before. Not bad for few hours' work!”

Visible 1



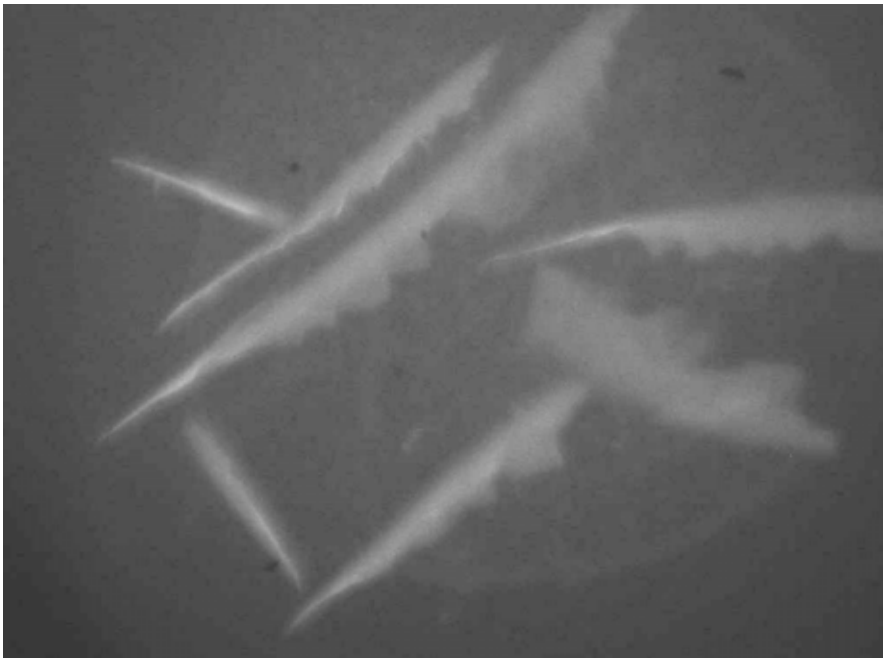
UV 1



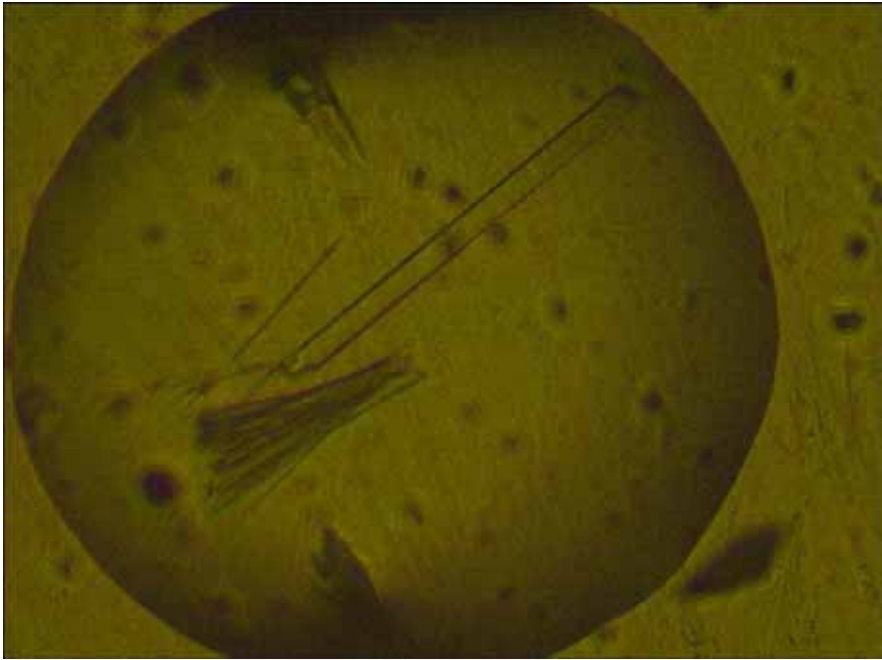
## Visible 2



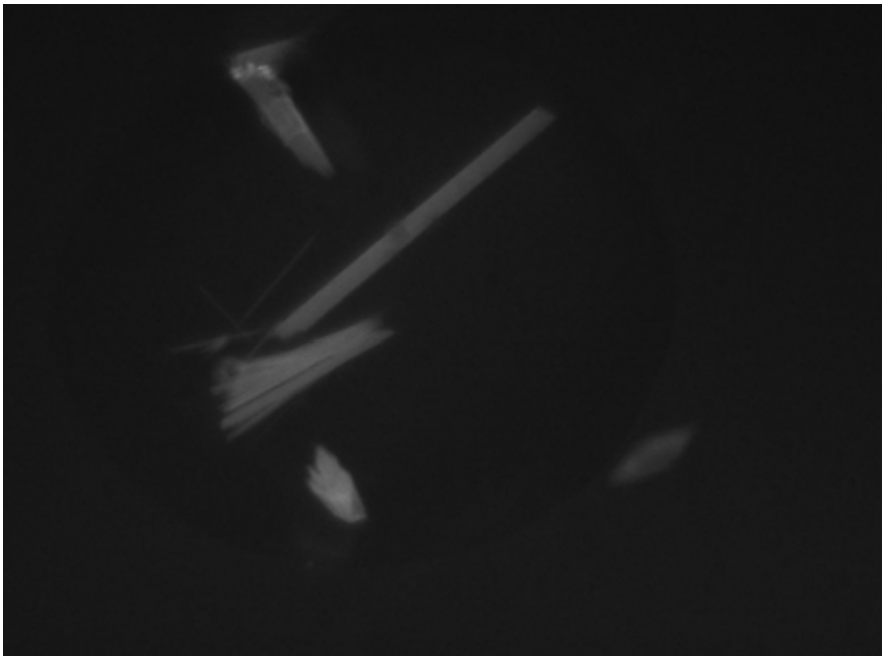
## UV 2



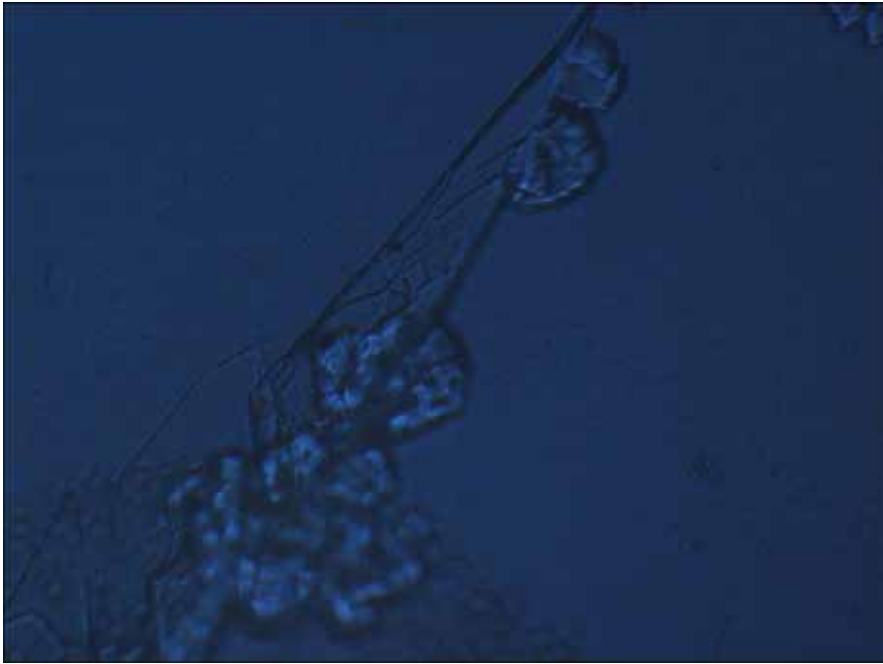
# Visible 3



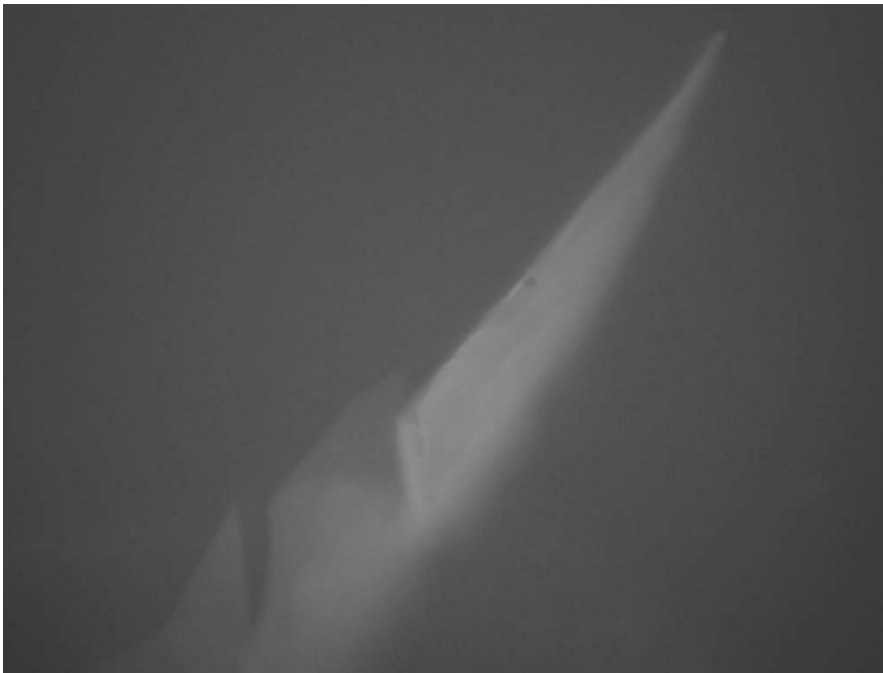
# UV 3



# Visible 4

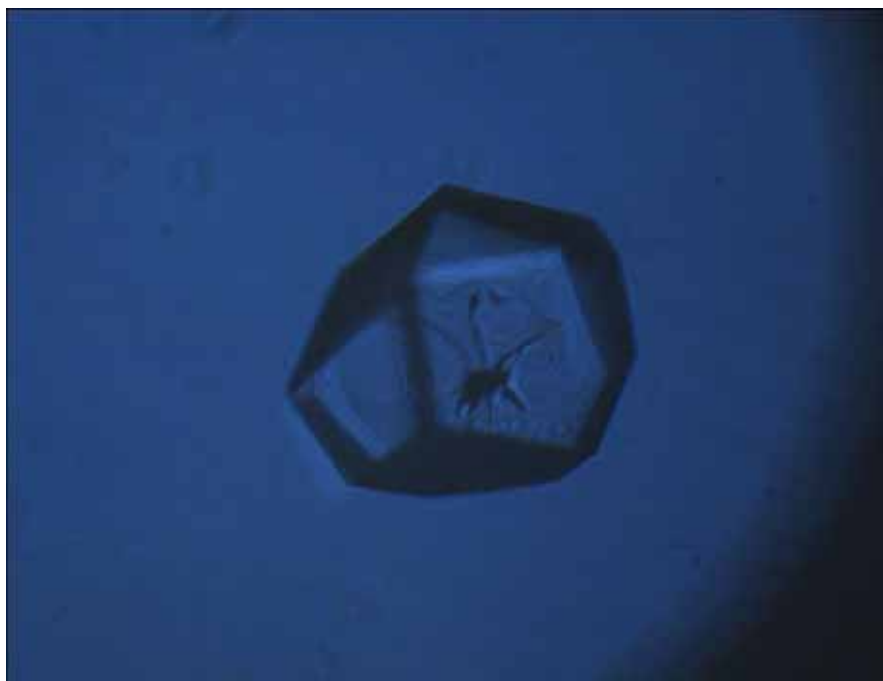


# UV 4

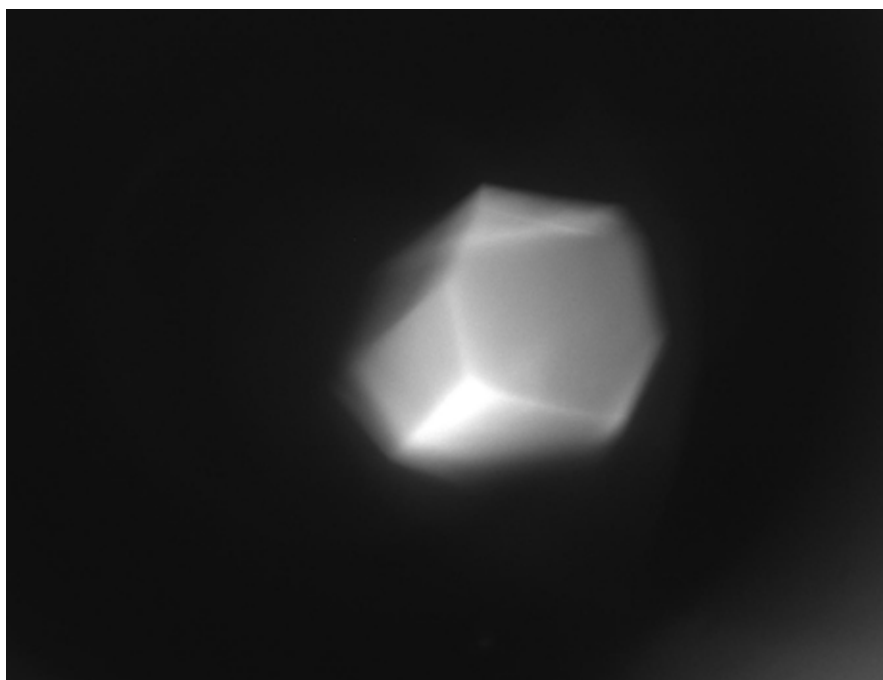




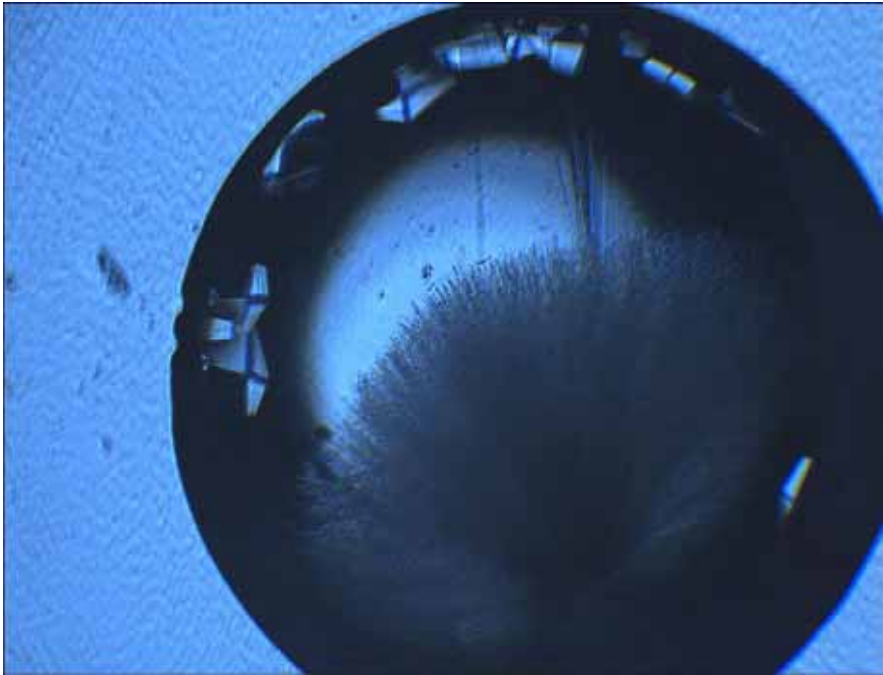
Visible 5



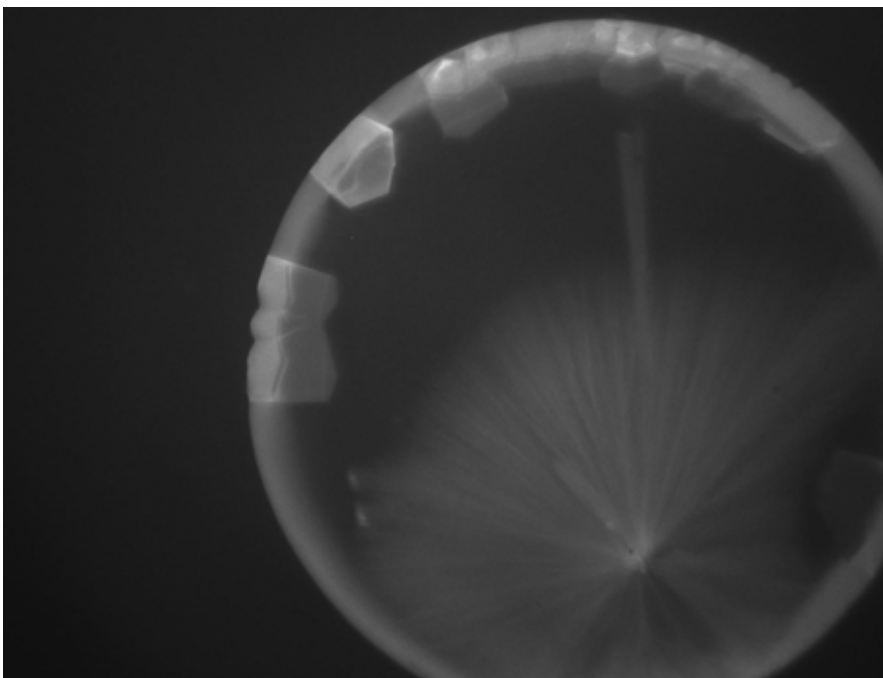
UV 5



Visible 6



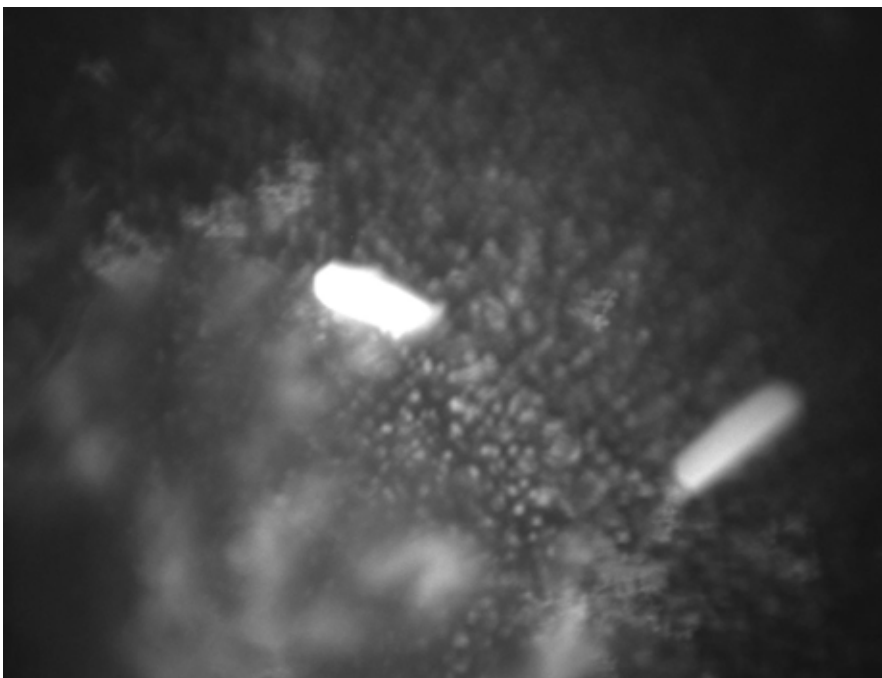
UV 6



# Visible 7



# UV 7

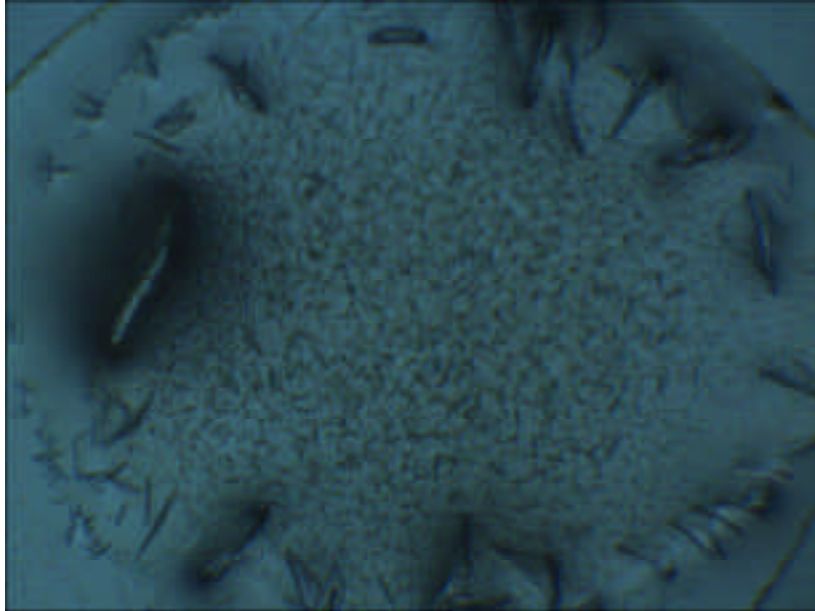


**The above paired protein crystallized ultraviolet/ visible images were secured on a Korima PRS-1000, Protein Review Station. The crystal images are Courtesy of UCLA, Duilio Cascio, Michael Sawaya, Ray Banatao, Dan Boutz, Todd Yeates, Pau Bajaj, Inna Pashkov, Jeff Abramson, Jabriel Mercado and David Eisenberg.**

## 100% Protein Crystal Detection

- Small as 1 micron: NO PROBLEM
- Out of Focus: NO PROBLEM

### Visible



### UV

