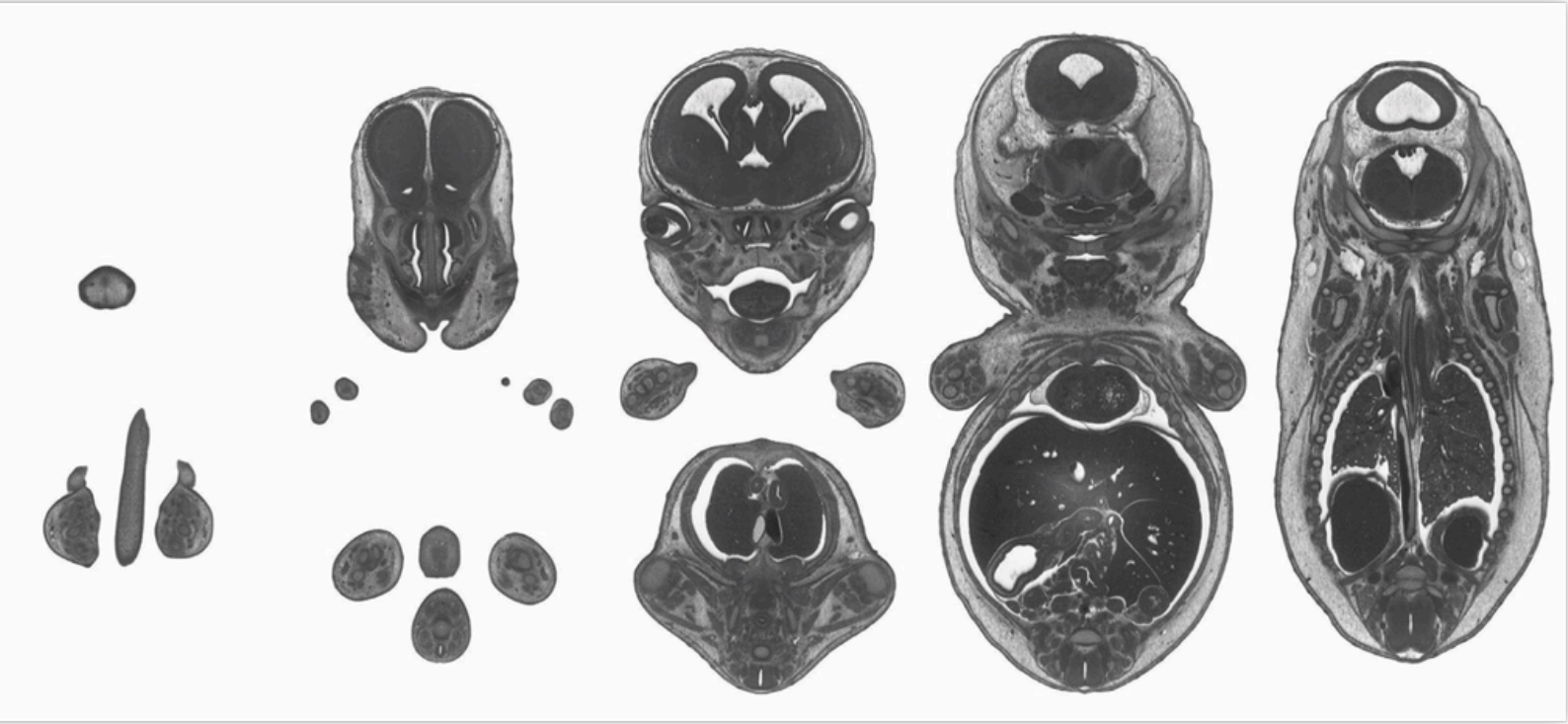
Optical High Resolution Episcopic Microscope (OHREM)



Visualise Detail in Larger, Denser, Samples in 3D with OHREM Instruments

INDIGO SCIENTIFIC

About Indigo Scientific
Indigo Scientific are a UK based imaging systems company with over 20 years' experience in optical solutions. We have developed and specialise in HREM imaging instruments delivering worldwide the technology for 3D analysis.

Optical HREM MICRO

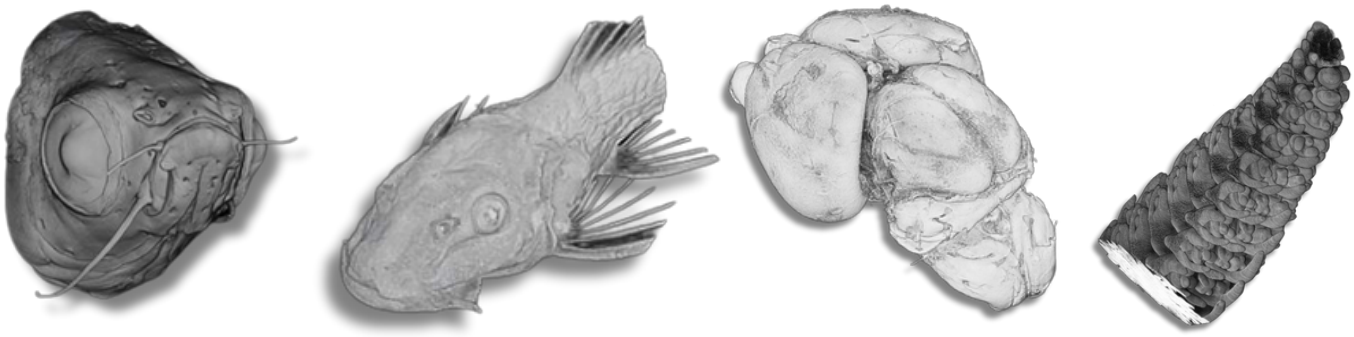
Introduction to HREM

HREM generates full 2D datasets of perfectly aligned images that create highly detailed 3D morphological data down to under 1 micron in voxel size. Image whole samples from individual organs to whole structures up to 30mm for a single image.

HREM technique works by capturing the blocks surface, combining the captured images into equally displaced images that form a volume. These volumes can then by measured and analysed down to 1 micron voxel sizes.

Advantages of HREM imaging

- No clearing required, image interpolation or distortion
- Capture dense tissue and bone with high contrast and clarity
- Produce perfectly aligned 3Ds without need for alignment and resolution from 1-8 micron voxel sizes
- Easily manipulated datasets accessible in many software suites (imagej, fiji, dragonfly etc)



3D Renderings of HREM Samples

Optical HREM Products

Indigo Scientific manufacture HREM products from consumables to whole instrument setups. Each system is assembled and designed by our team in the UK and are designed solely for imaging HREM samples.

We offer two major systems for imaging HREM samples the Micro and the Ultra, both produce high-quality images but differ only in specifications and flexibility. Ultra systems are tailored for creation of advanced image series, with more than one fluorescence channel and make use of an XY scanning stage for either imaging more than one block or scanning the surface of a sample.

Optical HREM Micro

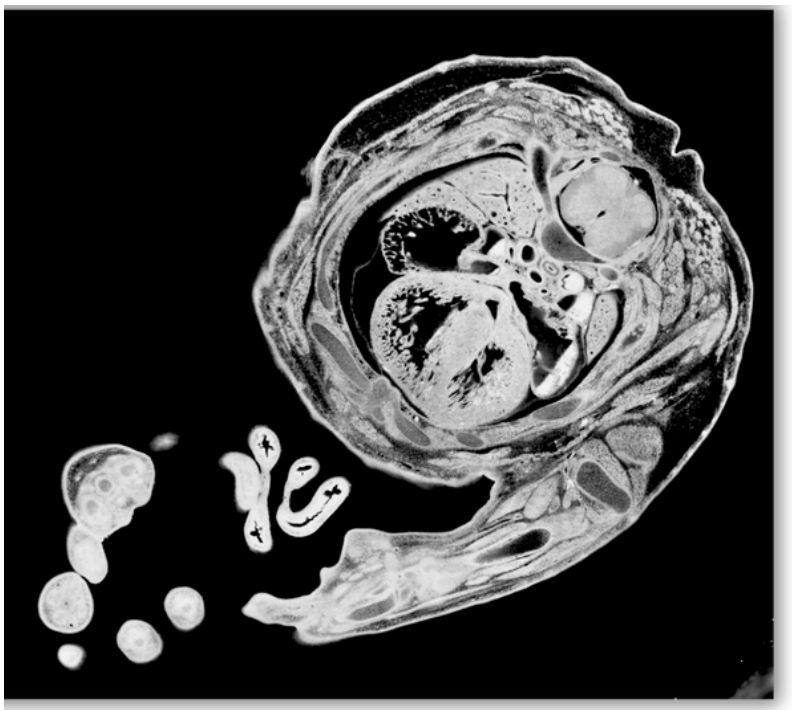
Micro offers 3D image generation in a simple form factor, featuring a smaller footprint. Designed for throughout operations for single shot imaging of whole samples.

Micro systems offer the same quality of OHREM while making it more accessible to all labs and settings. With a monochrome 20 megapixel output the Micro delivers single shot high resolution images perfect for 2D and 3D analysis of denser, complex structures.

This instrument features a highly accurate Z stage, encoded for Z results, for a sample height of up to 25mm. Meaning a block up to 25mm high can be imaged at 1 micron sections.

- Fast, high-resolution, single shot 20 megapixel imaging
- Economical and compact form factor for smaller labs or settings wishing to trial HREM imaging
- Easy to use front facing design with few a straightforward setup
- Upgradeable to multiple fluorescence channels

OHREM Micro



Mouse 2D Section

Optical HREM Ultra

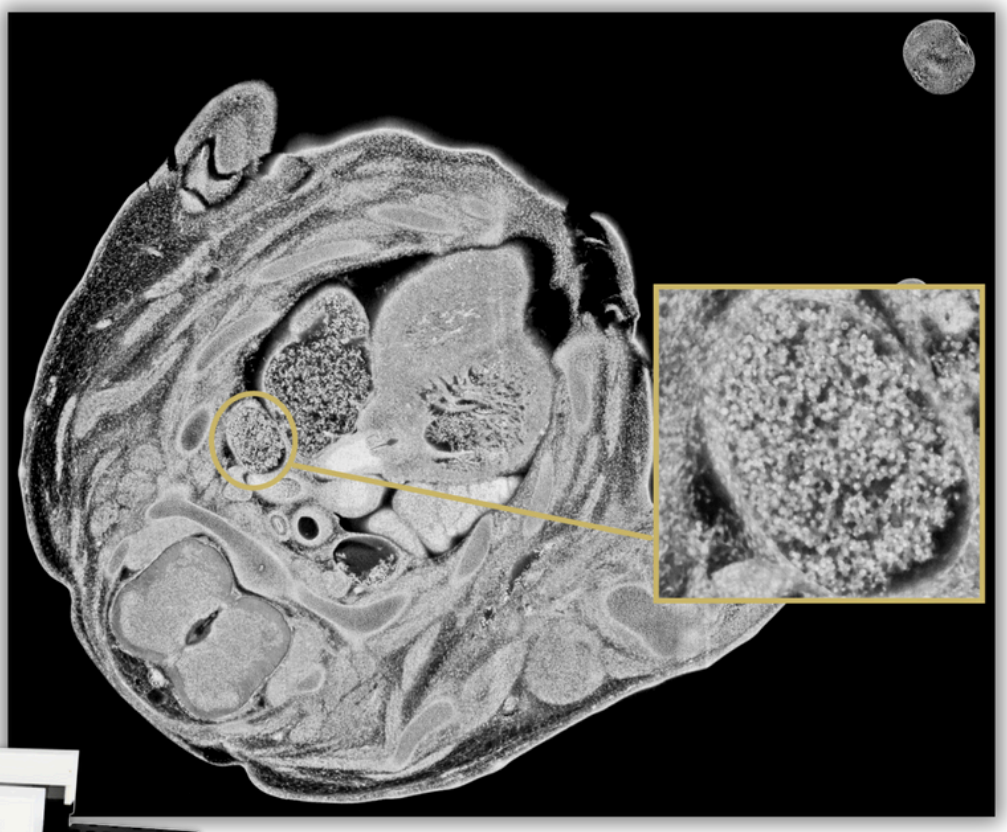
Ultra systems offer vast flexibility in imaging modes designed to perform HREM as well as fluorescence channels, with plenty of additions and options for enhanced imaging.

Ultra provides a large form factor for an automated XY to be fitted for scanning up to 60mm of sample using a variety of magnifications, this also allows for imaging multiple blocks in one run.

With the Ultra system take full advantage of resolution with the scanning stage, allowing experiments to be revolved around resolution required and not the size of the sample. Or perhaps increase throughput with multiple samples in one run.

Ultra systems come standard with 30mm Z range that can be extended to 50mm (for the zoom setup only) to allow for larger Z Samples.

- Versatile imaging for up to 60mm of sample with scanning
- Designed for multiple fluorescence applications as well as standard HREM
- Compatible with 60mm, 80mm and 160mm blades
- Simultaneously image 4 samples in one run



Mouse 2D Section Scanned

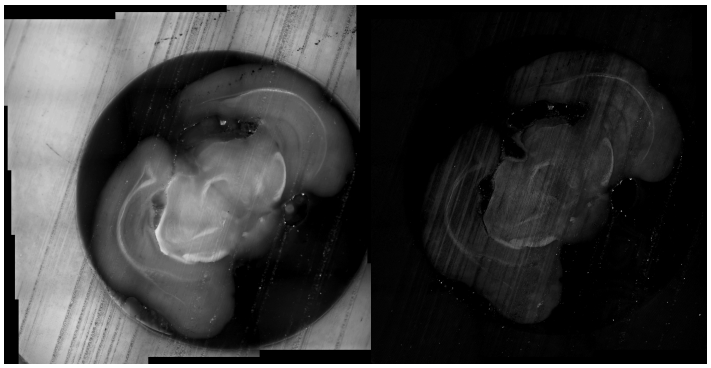
OHREM Ultra

Options and Extras

We offer a range of addons and accessories for generating block face imaging data.
All can be added at any point to your setup.

Structured Illumination

Decrease out of focus information or simply clarify your sample from optical artefacts with the structured illumination add-on which helps in the production of multi-fluorescence stacks.



Mouse Brain with Structured Illumination

Multi-fluorescence

Add custom setups of different fluorescence channels, for experimentation with dyes and labeling with block face imaging and HREM in wide field.

LacZ + HREM Stained Sample

Optical Setups

We offer the opportunity to put a variety of optical setups on our Optical HREM systems.
With upright models, zoom models and different imaging methods.

Upright Scanning Sample

Custom Solutions

From software to hardware we are can mould your unit to your requirements. Some examples:

- BNC triggers
- Temperature regulation
- Custom sample holders/moulds/blocks
- Hardware integration

OHREM Specifications

	Optical HREM Micro Specifications		Optical HREM Ultra Specifications	
Optics Type	Zoom optics (FOV: ~2mm - ~25mm)	Fixed Single Objective Optics (FOV: Variable with objective)	Zoom optics (FOV: ~2mm - ~25mm)	Fixed Full Upright Optics (FOV: Variable with objective)
XY Stage	Fixed XY Stage with slight XY adjustments for sample centering.	Small motorised XY stage for sample centering (no scanning)	XY Stage for scanning, multiple samples, positioning with range of 80mm	
Max Sample Dimensions	25mm x 25mm x 30mm		60mm x 60mm x 30mm (With scanning)	
Digital Output	20 megapixel (12 bit) monochrome images as tif/tiff/jpg/jpeg/bmp.		20 megapixel (12 bit) monochrome images as tif/tiff/jpg/jpeg/bmp	Other imaging options available for different sensitivity requirements
Channels	1 Morphology Channel	2/4/8 Channels including morphology channel	1 Morphology Channel	2/4/8 Channels including morphology channel
Options	• Dual/multi-fluorescence and focus adjustment, • Different imaging capabilities • Motorised XY (no scanning) • Fixed zoom optics available		• 2 position sample holder • 4 position sample holder • Dual extraction for multi-samples • Dual/multi-fluorescence and focus adjustment • Different imaging capabilities • Structured Illumination • Increased Z height to 50mm • Upright compound optics available • Whole system desk controller	

Optical HREM Consumables

Split Moulds

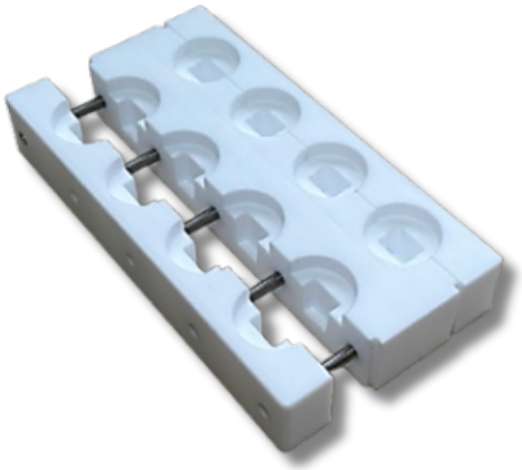
Split moulds are used for samples as they offer benefits over traditional moulds.

- Heat resistant, with a high temperature property, they withstand even the most demanding thermal re-actions.
- Customisable, each moulds is made to order with a size to fit.
- Most importantly, they split. This allows for taller blocks to be made as they can be easily extracted from the mould.

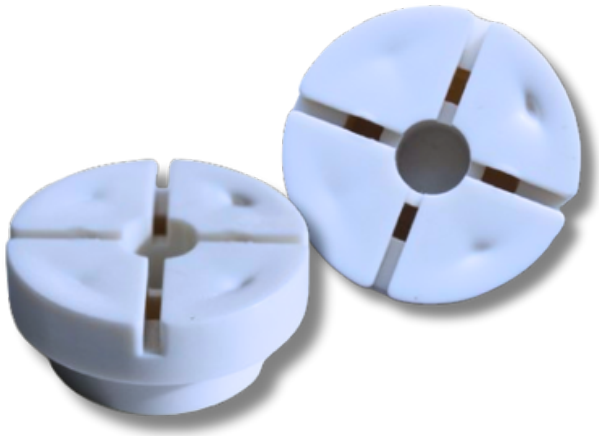
Sample Bases

Sample bases are designed to be used with OHREM instruments, comprising of bondable plastic, fit directly into the holder.

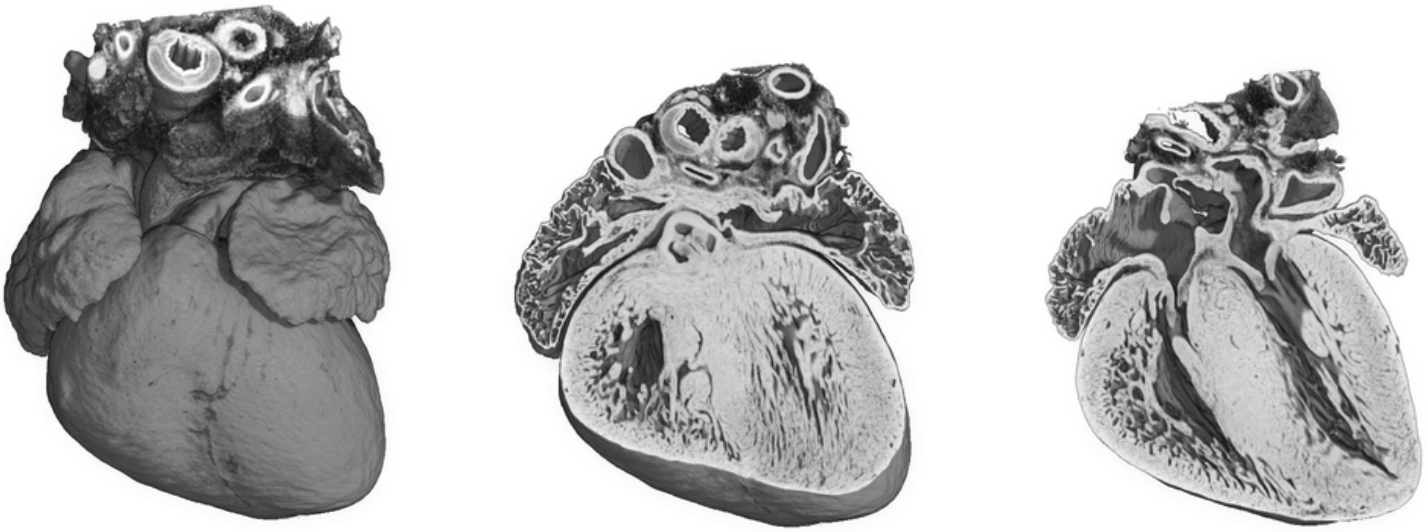
The design features grooves which help with adhesion to the surface. This also allows the lesion during cutting to create a stronger structure.



Split Mould



Custom HREM Chucks



HREM Heart Sample 3D Rendering

Software for HREM

Indigo have generated a few software packages, these packages help make tasks easier for handling HREM datasets. Indigo have made these tools accessible to all, beyond the control software, to allow data to be shared to collaborators.

Optical HREM Acquire

Optical HREM systems are controlled via the included OHREM Acquire software, this software works as a hub to control the system and peripherals for repetitive operation. Acquire sets up the instrument for lots of possibilities with Optical HREM instruments, from multi-fluorescence capture to XY scanning.

Acquire software has a license attached to your machine making possible to use later versions of the software free of charge.

HREM Heart Sample 3D Rendering

Translation Tools

Combine whole stacks or individual images with the translation tool stitching wizard. With a variety of ways to combine images and stacks easily for HREM or biological images.

- Montage large images with manual/automated tools
- Apply montages to whole stacks of images
- Save magnifications for later use e.g. 1x,2x,5x,10x
- Align two mismatched stacks with the overlay tool

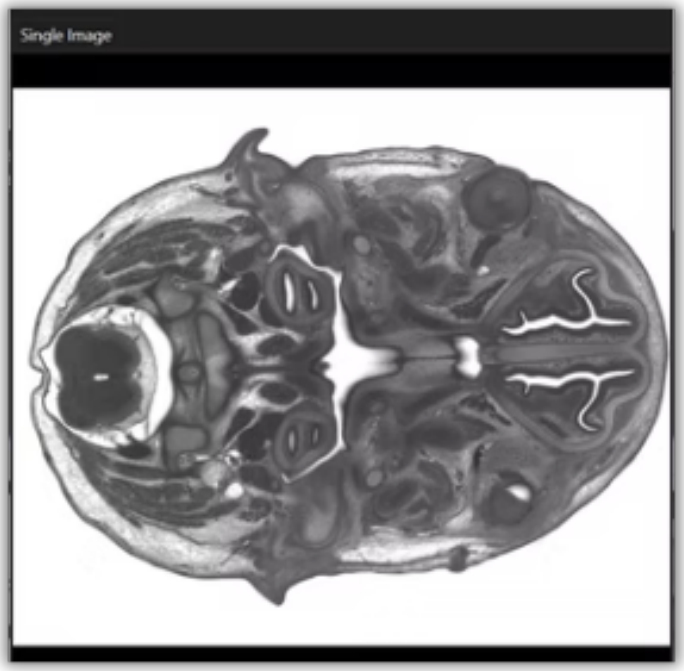
Montaging Example

Stack Viewer

Visualise TIF/TIFF stacks from OHREM instruments easily with the stack viewer, designed to easily look through HREM data stacks. Adjust resolution and use the scroll and zoom style window for deep analysis of 2D images without the use of complex software.

- View Tif/Tiff images in a sequence easily with just one click
- Reduce image size of image feed while loading to decrease wait times
- Designed for UI responsiveness, reducing loading times

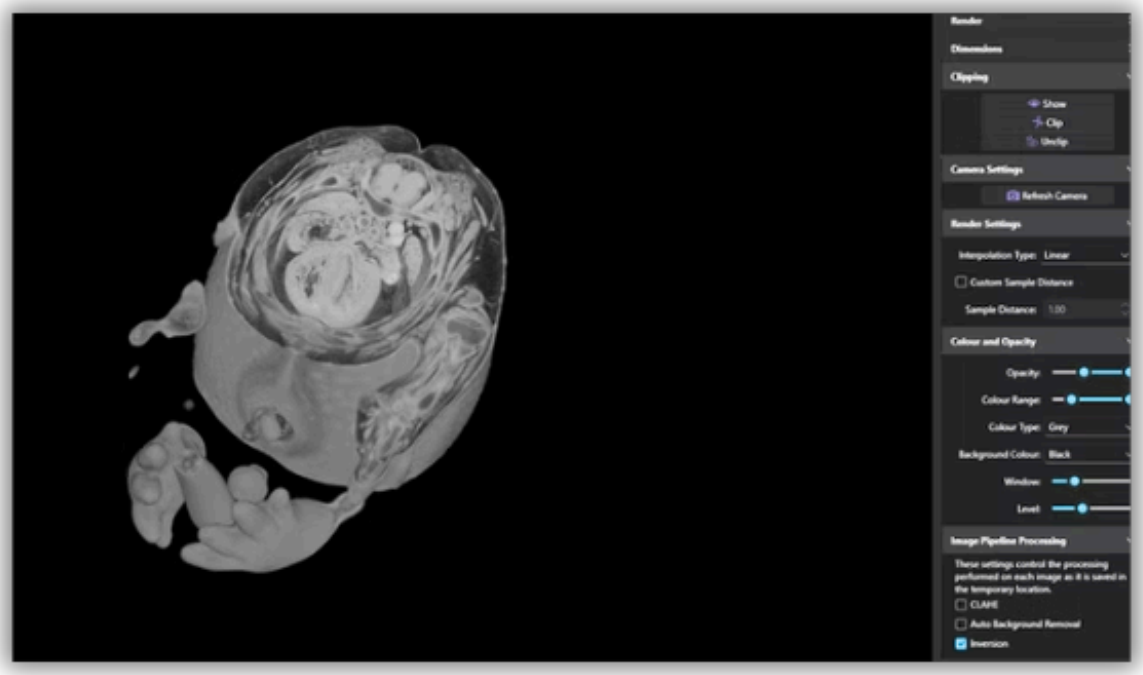
Mouse Section Shown in Viewer



3D Viewer

Easily transform 2D image stacks into 3D data anywhere with the simple to use, lightweight 3D stack viewer. Designed for sharing data, without licenses or restrictions.

- Generate 3Ds at any resolution
- Built in pipeline for fast HREM image generation (inversion)
- Adjust window and level live in the viewer
- Crop models live to view the intricate detail within



Mouse Embryo Rendered in Viewer

Get In Touch

To learn more about HREM get in touch with us

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Telephone: (44) 01462 633500

Useful Links

OHREM Micro -> www.indigo-scientific.co.uk/hrem-products/hrem-micro
OHREM Ultra -> www.indigo-scientific.co.uk/hrem-products/hrem-ultra
Example Images and 3Ds -> https://www.indigo-scientific.co.uk/3d-optical-hrem-imaging/hrem-examples
Software Downloads -> https://www.indigo-scientific.co.uk/software