The capabilities of the confocal microscope at the Center of Innovation for Biomaterials in Orthopaedic Research (CIBOR) are available to both university researchers and industry clients.

Confocal microscopy is a technique for obtaining high-resolution optical images with depth selectivity. The key features of a confocal are optical sectioning, and three-dimensional reconstruction for live specimens. It increases the optical resolution and contrast of a micrograph by using point illumination and a spatial pinhole to eliminate out-of-focus light in specimens. Confocal has been widely used in life sciences, from cell biology and genetics to microbiology, developmental biology and neurobiology, and as well as in semiconductor inspection and material research.

CIBOR’s Leica TCS SP5 II confocal system is well-equipped for optical sectioning, spectral scanning, and three-dimensional measurement of any fixed or live cell/tissue with a full array of scan speeds at highest resolution.

Capabilities:
- Imaging diverse fluorophores in fixed or live samples;
- Environmental control for temperature and CO2 to keep cells viable during and after imaging;
- Spectrally tunable detectors;
- Choice of high resolution conventional scanner or ultra-fast resonant scanner (10x faster, reduced photo-damage with live specimens);
- 3D z-stacks, timelapse, multi-position and tile scan;
- FRAP/FLIP/Photoactivation, FRET (calcium, ratio or acceptor photobleaching), etc.

Objectives:
- 5x/0.15 dry
- 10x/0.30 dry
- 20x/0.70/wd 0.26 imm
- 25x/0.95/wd 2.50 w
- 40x/1.25 oil
- 63x/1.40 oil

Laser Specifications:
- UV Diode 405nm: DAPI
- Argon (Vis): 458/476/488/514nm: FITC/GFP
- DPSS (Vis) 561nm: TRITC/Rhodamine/Texas Red/Cy3
- HeNe (Vis) 633nm: Cy5(Near Infrared)

Microscope Specifications:
- Leica DMI6000 inverted microscope
- Fully motorized XYZ
- BF, DIC & Fluorescence

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The Center of Innovation for Biomaterials in Orthopaedic Research is part of Wichita State University's National Institute for Aviation Research. CIBOR uses composite materials that have been developed for the aircraft and aerospace industries and adapts them for medical devices emphasizing orthopaedic implants. CIBOR was created to promote translational research of biomaterials for orthopaedic applications and develop an active medical device industry for the state of Kansas.