Live/Dead Cell Fiji (or ImageJ) Analysis

Software: <https://imagej.net/Fiji> (Fiji = newer ImageJ)

Scripting Tutorial: <https://www.ini.uzh.ch/~acardona/fiji-tutorial/#s1> (aim to use python/ Jython)

Java API: <https://javadoc.scijava.org/>

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4041579/#R17>

<https://journals.sagepub.com/doi/full/10.1369/jhc.4A6511.2005?url_ver=Z39.88-2003&rfr_id=ori%3Arid%3Acrossref.org&rfr_dat=cr_pub%3Dpubmed>

<https://brtilifesciences.com/PDF/Quantification%20of%20Live_Dead%20Staining%20Using%20Fiji%20software.pdf>

<https://github.com/imagej/imagej-scripting/blob/master/src/main/resources/script_templates/Tutorials/Wiki_Jython_Tutorial_1.py>

Jadin KD, Wong BL, Bae WC, Li KW, Williamson AK, Schumacher BL, Price JH, Sah RL. Depth-varying density and organization of chondrocyte in immature and mature bovine articular cartilage assessed by 3-D imaging and analysis. J Histochem Cytochem. 2005;53:1109–1119. PMID: 15879579. [[Link](https://journals.sagepub.com/doi/full/10.1369/jhc.4A6511.2005?url_ver=Z39.88-2003&rfr_id=ori%3Arid%3Acrossref.org&rfr_dat=cr_pub%3Dpubmed)]

“Three-dimensional imaging and image processing of articular cartilage allows for direct assessment of cell organization in tissue volumes of various sizes and geometries ([Figure 1](https://journals.sagepub.com/doi/full/10.1369/jhc.4A6511.2005?url_ver=Z39.88-2003&rfr_id=ori%3Arid%3Acrossref.org&rfr_dat=cr_pub%3Dpubmed)). With **confocal microscopy**, successive thin z-sections are obtained by axial motion of the sample stage, allowing for capture of registered serial sections. However, even with laser-based multi-photon systems, imaging depth into the tissue is *limited by diffusion and scattering of light*, typically ≃100 μm in cartilage ([Figure 1A](https://journals.sagepub.com/doi/full/10.1369/jhc.4A6511.2005?url_ver=Z39.88-2003&rfr_id=ori%3Arid%3Acrossref.org&rfr_dat=cr_pub%3Dpubmed)) ([Wong et al. 2001](https://journals.sagepub.com/doi/full/10.1369/jhc.4A6511.2005?url_ver=Z39.88-2003&rfr_id=ori%3Arid%3Acrossref.org&rfr_dat=cr_pub%3Dpubmed)). A relatively new technique**, digital volumetric imaging (DVI)**, overcomes this limitation via surface imaging microscopy, wherein volumes are obtained by physical sectioning and imaging the surface of fluorescently stained tissue embedded in an opaque polymer ([Ewald et al. 2002](https://journals.sagepub.com/doi/full/10.1369/jhc.4A6511.2005?url_ver=Z39.88-2003&rfr_id=ori%3Arid%3Acrossref.org&rfr_dat=cr_pub%3Dpubmed)). With this method, a large tissue volume, with depths effectively unlimited and practically up to several millimeters, can be imaged at high resolution ([Figure 1B](https://journals.sagepub.com/doi/full/10.1369/jhc.4A6511.2005?url_ver=Z39.88-2003&rfr_id=ori%3Arid%3Acrossref.org&rfr_dat=cr_pub%3Dpubmed)). With 3D data from such methods, 3D image-processing methods could be used to identify tissue features (e.g., cells) and quantify their organization. Automation and standardization of such methods would be useful to analyze samples quickly and repeatably.”