YX1: Yokogawa CSU-X1 spinning disk confocal microscope, LSB B212
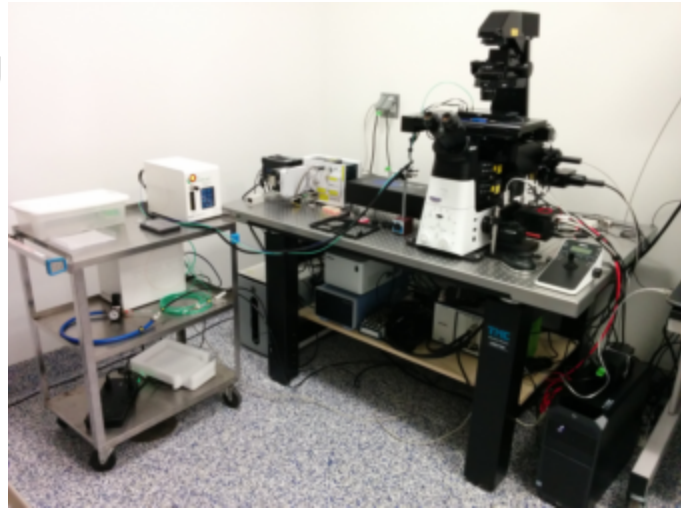

The components marked <mark>IPD, Fowler or Winkler</mark> are owned by the Insititue of Protein Design, Fowler, or Winkler Lab. They are made available through a collaboration between the Department of Biology and the above mentioned units.

Spinning disk, left camera port

- CSU-X1 unit
  - Microlens-enhanced Nipkow disk
  - 1500–10000 rpm, continuously adjustable
  - 3-position dichroic filter wheel with a quad band filter: 429–491, 516–552, 583–636, 672–748
  - 6-position emission filter wheel with 4 single band and a quad band filters
    - 455/50 (430–480)
    - 525/36 (507–543)
    - 605/52 (579–631)
    - 705/72 (669–741)
    - 428–466, 509–531, 578–616, 671–738
  - image size is about 7.8 mm×10.7 mm (710×970 pixels as projected on to the camera, usable ROI is 650×928 pixels)

- Nikon LUN-F XL laser launch with 4 solid state lasers: 405, 488, 561, 640 nm

- Photometrics Prime95B back illuminated scientific CMOS camera
  - 95% QE at 550 nm
  - 16-bit digital output, monochrome
  - 11 μm×11 μm cell
  - readout time: 24 mS (41 fps) at 16-bit, full frame
  - 13.2 mm×13.2 mm sensor area, 1200×1200 pixel

- Gataca Live-SR super resolution module
  - motorized magnification switcher with standard (1×) and SR position (1.7×)
  - Live-SR deconvolution algorithm can be applied to live images or in post-processing
  - can be used with low or high magnification objective lenses
  - resolution up to 120 nm in XY

Widefield imaging, right camera port

- Lumencor Celesta light engine with 7 laser lines: 408, 445, 473, 518, 545, 635, 750 nm

- Hamamatsu ORCA-Fusion scientific CMOS camera
    - 80% QE at 550 nm
    - 16-bit digital output, monochrome
    - 6.5 μm×6.5 μm cell
    - readout time: 11.22 mS (89 fps) at 16-bit, full frame
    - 14.98 mm×14.98 mm sensor area, 2304×2304 pixels

- Finger Lakes Instrumentation HS-625 high speed emission filter wheel with 5 bandpass filters:
    - 514/30 (499–529)
    - 565/24 (553–577)
    - 624/40 (604–644)
    - 676/29 (662–691)
    - 732/68 (698–766)

Microscope

Nikon Ti2-E: inverted stand with Perfect Focus System, infinity optics, epifluorescence, motorized stage and motorized objective and filter cube turrets

- objectives
  - Plan Apochromat Lambda 4×, NA 0.2, WD 20.0 mm^{IPD}
  - Plan Apochromat Lambda 10×, NA 0.45, WD 4.0 mm^{Fowler}
  - Plan Apochromat Lambda 20×, NA 0.75, WD 1.0 mm
  - Plan Apochromat Lambda 40×, NA 0.95, WD 0.17–0.25 mm, correction collar for cover glass thickness (0.11 mm to 0.23 mm)^{IPD}
  - S Plan Fluor ELWD ADM 40×, NA 0.60, WD 3.6–2.8 mm, correction collar for cover glass thickness (0 mm to 2 mm), phase contrast PH2^{Winkler loaded on demand only}
  - Plan Apochromat Lambda 60× oil, NA 1.4, WD 0.13 mm^{loaded on demand only}
  - Apochromat Lambda S LWD 20× water, NA 0.95, WD 0.90–0.99 mm, correction collar for cover glass thickness (0.11 mm to 0.23 mm)^{loaded on demand only}
  - Apochromat Lambda S LWD 40× water, NA 1.15, WD 0.59–0.61 mm, correction collar for cover glass thickness (0.15 mm to 0.19 mm)^{loaded on demand only}
  - Plan Fluor 40× oil, NA 1.3, WD 0.20 mm^{loaded on demand only}

- upper filter cube turret^{IPD} for the Celesta:
  - pentaband filter cube
    - dichroic: 422–467, 482–533, 558–623, 651–733, 764–865
    - emission: 424–462, 486–531, 562–620, 657–731, 769–865
  - CFP: DM 458, EM 483/32 (467–499)
  - CFP/YFP: DM 458, EM 542/27 (529–556)
  - YFP: DM 526, EM 544/24 (532–556)

- X-Cite 110LED epifluorescence light source: 375–660 nm

- lower filter cube turret for the X-Cite
  - EX 340–380 DM 400, EM 435–485
  - EX 465–495, DM 505, EM 515–555
  - EX 528–553, DM 565, EM 590–650

- P736 PInano Z piezo stage with 200 μm travel, universal adapter for slides and dishes, and adapter for well plate, can accept the Tokai Hit stage top incubator

- Tokai Hit stage top incubator
  - TIZWX incubation system for dishes and well plate
  - STXF controller with analog flowmeter and STX–CO2O2 for hypoxia condition
  - setting range
    - CO_2: 5.0% ~ 20.0%
    - O_2: 0.1% ~ 18.0%
    - temperature: 30 °C ~ 40 °C

- National Instrument DAQ