***Genomics and Cell Characterization Core Facility (GC3F)***: This facility supports scientific research at the UO by making a broad array of high-end, specialized instrumentation accessible to UO researchers for genomic and flow cytometry applications, as well as offering in-house sequencing sample prep services, for both internal and external users. The facility provides next generation Illumina-based high throughput DNA sequencing and associated bioinformatics; robotics for high throughput manipulation of DNA samples; microarray-based genotyping; microarray printing; Pacific Biosciences (pacbio) sequencing; Sanger DNA sequencing; sample prep services; quantification instruments; liquid handling instruments; microscopy & imagine analysis; fragment analysis, and; a flow cytometer and a high-speed fluorescence activated cell sorter. GC3F includes *The Imaging Facility*, which supports scientific researchers with high resolution, state-of-the-art microscopy technologies for imaging. In addition to equipment, they provide trained operators and expert bioinformatics staff for experimental design, implementation, and interpretation. The director is a PhD-level research associate and the full-time research staff consists of three masters-level scientists running machines and working on collaborations with labs.

**Instrument Details**

* Illumina Sequencing—GC3F has been providing Illumina sequencing services since 2008, and since then, has sequenced thousands of samples on multiple Illumina platforms. GC3F played a significant role in the development of the RAD-seq technique that was invented at UO, and still sequence “unconventional” libraries on the instruments. GC3F currently operates three Illumina DNA sequencers: MiSeq, NovaSeq6000, and NextSeq 500.
* Pacific Biosciences (PacBio) sequencing— The facility is a Certified Service Provider for PacBio Sequel II services, and offers affordable, high-throughput studies of microbes, plants, animals, and humans. Single molecules of native DNA are sequenced in real time on the Sequel instrument utilizing devices called "SMRT cells". Each SMRT cell can yield between 5 and 10 Gb of sequence data, with a read length of greater than 10 kb on average.
* Sample Prep Services—GC3F offers full-service sample preps for many popular sequencing library types, including stranded mRNA-Seq, whole genome shotgun, 16S amplicon, 10X whole genome linked reads, single cell mRNA-Seq, PacBio, and many others, including custom projects by request. GC3F instruments applications include:
  + Sample partitioning into emulsion droplets for 10X Genomics single cell mRNA and whole genome linked-read sequencing;
  + Tissue homogenization for nucleic acid extraction;
  + DNA shearing to short lengths for Illumina sequencing;
  + DNA shearing to long lengths for 10X linked reads and PacBio long-read sequencing;
  + Pulsed field electrophoretic analysis and selection of long fragments for 10X whole genome or PacBio long-read sequencing Centrifigution of 96-well plates and refrigerated microtubes;
  + Controlled thermomixing of enzymatic reactions;
  + Heat sealing of PCR plates; and,
  + Concentration and drying of samples.
* Quantification Instruments—GC3F houses numerous instruments for DNA, RNA, and protein quantification, including: ABI StepOne Plus; ABI QuantStudio 3; BioRad CFX96; Molecular Devices Microplate Reader; Nanodrop; Qubit; Licor Odyssey Fc; GE Amersham Typhoon.

## Liquid Handling Instruments—The GC3F is home to two Rainin Linquidator 96 instruments Eppendorf EpMotion 5075 TMX: Liquid Handling Robotics

## Microscopy & Imag Analysis—GC3F offers training and support for the following microscopes: Nikon CSU-W1 SoRa Spinning Disk + TIRF; Custom-built TIRF microscope; Leica SPE Laser Scanning Confocal + Widefield; GE DeltaVision Widefield with Deconvolution; Zeiss LSM with SIM and Airy Scan. Support and training will exist in the near future for: Nikon Super-Resolution Spinning Disk; Custom-built Light Seheet microscope. The facility also has 3 analysis workstations and include the following software: Imaris 9.2 with Cell and Filaments Modules; Imaris 9.2 Converter and Stitcher; Prism8; Matlab 2018a; Adobe Illustrator and Photoshop.

* Fragment Analysis—The GC3F offers nucleic acid fragment size analysis using an Advanced Analytical Fragment Analyzer.
* Flow Cytometry—The GC3F houses two flow cytometers: a Sony SH800 cell sorter and a first-generation Applied Biosystems Attune Cytometer.