Appendix A: Technical Specifications
Single Cell Isolation and Picoliter Liquid Dispensing System
RFP 575925
February 12, 2020

Battelle Memorial Institute, Pacific Northwest Division, Management & Operating Contractor of the U.S. Department of Energy’s Pacific Northwest National Laboratory (PNNL) for the U.S. Department of Energy (DOE), is requesting proposals for a single cell isolation and picoliter liquid dispensing system to enable fully automated single cell detection, sorting, collection and processing for single cell RNA-Seq, single cell proteomics, and other cell-type-specific studies.

Instrument Specifications:
The following are requirements for the single cell isolation and picoliter liquid dispensing system:

1) The system shall have X,Y,Z stages with a software resolution of at least 1 µm, spatial accuracy below 10 µm, and positioning precision below 3 µm.
2) The system shall have a single cell imaging, measurement, and data processing system that can recognize and quantify geometrical properties for cells with diameters below 60 µm.
3) The system shall have a fluorescence detection system with 4-color (channel) fluorescence (DAPI, FITC, CY3, and CY5).
4) An automated tip wash station including ultrasonic wash will be a part of the system.
5) The system shall include two channel picoliter dispensers with dispensing volumes at least as low as 300 pL to at least up to 450 pL per drop.
6) The system shall have environmental control systems to maintain both, temperature (at least as low as -10 °C to at least up to 100 °C) and humidity (at least between 50% and 85% above room humidity) conditions.
7) The system shall have a head camera system for imaging dispensed droplets.