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HOME OF SIDNEY KIMMEL MEDICAL COLLEGE

JeffPost

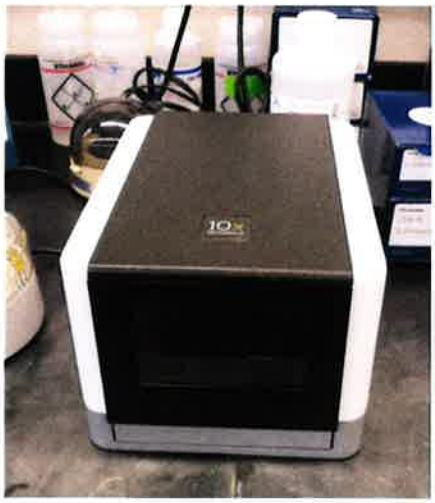
(Empowering Postdocs to Achieve Work-Life Balance)

October 2019

Omics Services Available to Jefferson Researchers

Dr. Paolo Fortina, Next Generation Sequencing Facility, Sidney Kimmel Cancer Center

Left and right: Paolo Fortina (Supervisor) and Gaurav Kumar (Postdoctoral fellow)



The neologism "omics" refers to a life-science field of study, and its associated biotechnologies, focused on examining sets of parameters on a large-scale. Among the omics, the first and most studied is that of whole genomes, a.k.a. genomics. At the Sidney Kimmel Cancer Center, the Jefferson Cancer Genomics Laboratory offers a full array of services that include whole genome, exome, epigenetic, and transcriptomic sequencing. Director Paolo Fortina, MD, PhD, shared with me some insight into the newest and most exciting addition to the facility's equipment: the Chromium System from 10X Genomics.

This technology allows for whole genome, exome, transcriptome, or chromatin (ATAC) sequencing at the single cell level. For example, the Chromium Single Cell Gene Expression solution enables researchers to identify rare cell types and understand cellular heterogeneity in complex biological systems, such as tumor tissue or neuronal populations. Starting with a suspension of one million cells, the system will partition and encapsulate single cells with barcoded primers to build a library for further sequencing on the Illumina sequencer.

The facility is dedicated to the needs of researchers, clinicians, and yes – postdocs, too! The staff provides the highest level of service, starting with counsel on experimental design and quality control. In addition, the facility also offers comprehensive data analysis, including interpretation allowing the delineation of differences between normal and diseased states. Dr. Gaurav Kumar, the in-house bioinformatician, provides up to three levels of analysis based on specific needs.

Finally, if you are considering using this technology and are concerned about pricing, the facility offers great incentives for preliminary data. So, when you write your next postdoc grant, don't forget to add the facility staff for a 10% effort on your proposal! If you are interested in this state-of-the-art technology:

Contact Dr. Paolo Fortina at paolo.fortina@jefferson.edu

- By: Aurore Lebrun (Ph.D.), Postdoctoral Fellow, Thomas Jefferson University

Dr. Gagan Kaushal, Mass Spectrometry Facility, Pharmaceutical Sciences

Left-to-right: Vinh Nguyen (PharmD Student), Miriam Hernandez-Meadows (Master Student, Biotechnology), Annie Chunn (Lab Coordinator), Ankit Rochani (Postdoctoral Fellow), Gagan Kaushal (Supervisor)

Mass spectrometry is an important technology for characterization of small and large molecules in biochemistry, chemistry, pharmaceutical, and biomedical sciences. Ionization techniques like electrospray ionization (ESI) and matrix assisted laser desorption ionization (MALDI), along with time of flight, quadrupole, and Orbitrap mass analyzer, have played significant roles in the development of new generation LCMS and LC-MS/MS instruments. The work on high resolution mass spectrometers (HRMS) started in the 1990s with the development of Q-Tof followed by Orbitrap mass spectrometers in 2000. The ions generated by ESI are trapped and oscillated around central electrodes to create individual signals with mass resolution of 150,000 units with mass error of 0.2 to 0.5 ppm. The introduction of chromatographic separation in mass spectrometry also introduced HR-LCMS technology that could resolve biomolecules on a column as well as provide m/z scale in mass spectrometer.

Today LCMS is extensively used to develop pharmacokinetic/dynamic (PK/PD) profiles (patient and animal tissues) for drug molecules, metabolite characterizations, proteomics, and metabolomics. At Jefferson College of Pharmacy, we have a Thermo Exactive LCMS facility for performing PK profiles for various active ingredients. The instrument can perform quantitative identification of multiple drug and metabolic biomolecules in a single LCMS method in nanogram concentrations. The facility operates as per good laboratory practices (GLP) norms and provides LCMS method as per Food and Drug Administration (FDA) and International Council of Harmonisation (ICH) guidelines for bioanalytical characterization. Furthermore, the LCMS methods are currently being developed from various animals (rats, mice, monkeys, and others) and human tissues and plasma to understand the PK or metabolic profile of drug molecules. Advanced computational tools like WinNonlin and Compound Discoverer for PK/PD models and metabolite identifications are also available.

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TJU

National Postdoc Appreciation Week (NPAW) 2019

As part of a long tradition for the Jefferson Postdoc Association (JPA) and the Office of Postdoctoral Affairs, we spend a week celebrating the hard work done by the Jefferson postdoctoral community. In September 2009, the National Postdoctoral Association (NPA) started sponsoring the NPAW event. In 2010, this week was officially recognized by the US House of Representatives and is celebrated in various research institutes around the country and other parts of the world. According to NPA data, in 2018, 108 institutes in the US, Canada, Germany and the UK organized 432 events to recognize and appreciate the work done by postdoctoral fellows. This year the event was celebrated from September 16-20.

Every year, the JPA chooses a theme to help make this week memorable and enjoyable for their fellow colleagues. In 2018, JPA celebrated NPAW by creating 5 events centered around the theme of "Empowering Postdocs." This year's theme was "Work-Life Balance." The JPA organized 8 events distributed over 5 days that were hosted at various places in TJU (Center City). Here are the highlights of the NPAW events:

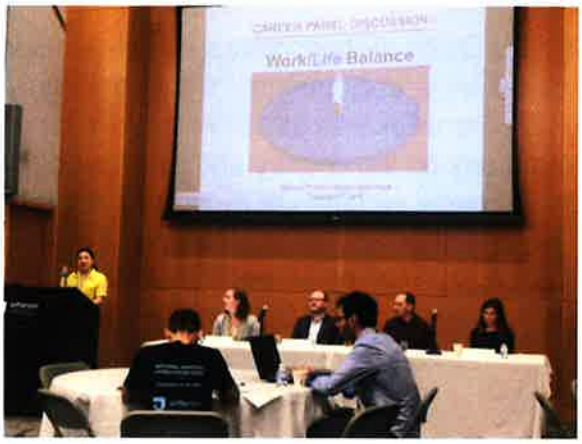
1) NPAW kicked off with coffee, donuts, and T-shirts (designed by Dr. Jenny Schneider, Postdoctoral Fellow).

Bottoom Photo: NPAW 2019 Organizing Team *(Left-to-right: Liliana Camarillo-Rodriguez, Giacomo Casella, Larissa Ishikawa,* Thomas Jefferson, *Angelica Zambudio-Ochoa, Jenny Schneider, Daniel Rubinstein, and Lisa Kozlowski (Not in the photo: Xi Chen, Brigid Jensen, Judy Lewis and Ankit Rochani)*

2) Yoga Class

3) Salsa Dancing Instruction

4) Breakfast with Career Panel Discussion



JPA Executive Board Alumni were invited to share their stories of career transition (Left-to-right): Dr. Erin Heine, Assistant Director, TJU Postbaccalaureate Pre-Professionalism Program; Dr. Gabor Kari, Associate Director, Novartis; Dr. Fred Kaplan, Senior Research Scientist, Janssen, and Dr. Heather Montie, Associate Professor, Philadelphia College of Osteopathic Medicine.

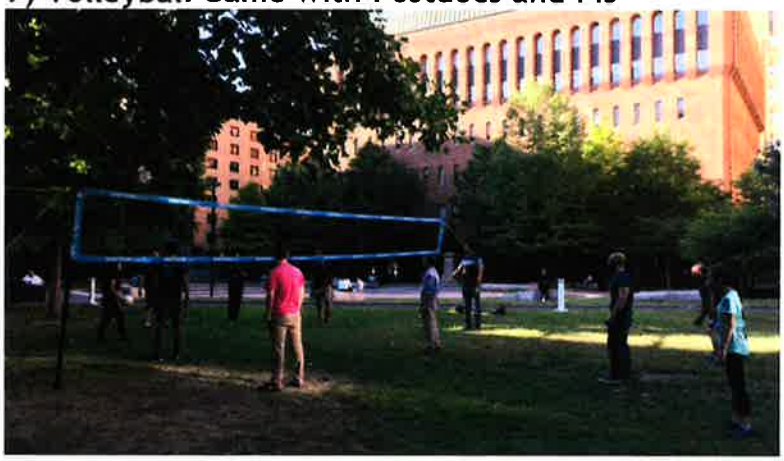
5) Philly Postdoc Community Social Hour

As a part of NPAW, Postdocs from UPenn, Drexel, CHOP, Temple, and Jefferson were invited to the 1st Philly-wide Postdoc Community Social Hour.

6) Dr. Paul-Andre Genest, Senior Editor, Wiley

Dr. Genest discussed scientific publishing and its evolution in various areas of science.

7) Volleyball Game with Postdocs and PIs



8) Social Hour at Strangelove's

Summary: Overall NPAW was a success. More than 50 postdocs and PIs participated in this year's events.

Acknowledgments: *JPA Board members for sharing data and executing all the events. Dr. Lisa Kozlowski, Office of Postdoctoral Affairs, and Pamela Walter, OPWPC, for editing this issue.*

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