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Dr. Jitendra Belani, NMR Facility, Dept. of Pharmaceutical Sciences

Nuclear Magnetic Resonance (NMR) spectroscopy is an important tool for structural analysis of small and large molecules. Unlike mass spectrometry, NMR is a powerful, nondestructive analytical technique, indispensable for structural elucidations and verifications in synthetic and biosynthetic processes. The resolution of NMR is based on the strength of the magnetic field applied to the sample. Increased magnetic field strength increases relative resolution of the instrument. NMRs are available in magnetic strengths ranging from 300 MHz to 1.1 GHz.

The Jefferson College of Pharmacy has a robust Burker 400 MHz NMR machine, which can perform routine structure verification of small molecules, monitor progress of chemical reactions, and quantitatively measure concentrations of small molecules. The instrument can potentially assess protein interactions with small molecule ligands up to 30 kDa. Finally, the NMR instrument, coupled with high resolution HPLC-MS, can support quantitative metabolite characterization with a high level of reproducibility. NMR alone is particularly useful in characterizing compounds that are less amenable to LC-MS analysis such as sugars, organic acids, polyols, or other highly polar compounds. The instrument is capable of observing ^{1}H (proton), ^{13}C, ^{15}N, ^{11}B, ^{19}F and ^{31}P isotopes either separately or simultaneously to study different metabolite classes such as nitrogen-containing or phosphorus-containing compounds. Furthermore, the correlation of two or more nuclei can be measured using multidimensional NMR methods.

The sample preparation procedures require use of polar deuterated solvents like D_2O, d_6-DMSO, or d_3-acteonitrile for polar compounds or salts. For small molecule characterization, $CDCl_3$ is generally used, which allows efficient sample recovery. A quick analysis on this 400 MHz NMR requires a 5mg sample of a small molecule It takes about 20 min to acquire and process ^{1}H-NMR and about one hour to complete a ^{13}C-NMR. For complex molecules or if material available is less than ideal, longer experiment times are essential. Both mass spectrometry and NMR capabilities are available for Jefferson researchers for a nominal cost or through scientific collaborations with Dr. Kaushal and Dr. Belani.

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Annual Winter Bash




In January, we had our annual Winter Bash, which was organized in collaboration with the Graduate Student Association (thanks Alison!). This year, the theme was superheroes, in celebration of the epic ending to the "Avengers" movie series. There was a great turnout of graduate students and postdocs to enjoy the delicious superhero-themed dinner, courtesy of Jefferson catering (thanks Chuck!), and to compete in the superhero-themed quizzo! (Do you know the Black Panther's real name?) From graduate students dressed up as Wonder Woman, to postdocs sporting their "postdoc is my superhero" shirts, and future postdocs in Batman costumes, lots of fun was had by all! Looking forward to next year's Winter Bash!

-Dani Rubinstein, Ph.D.

JPA VP Social Affairs

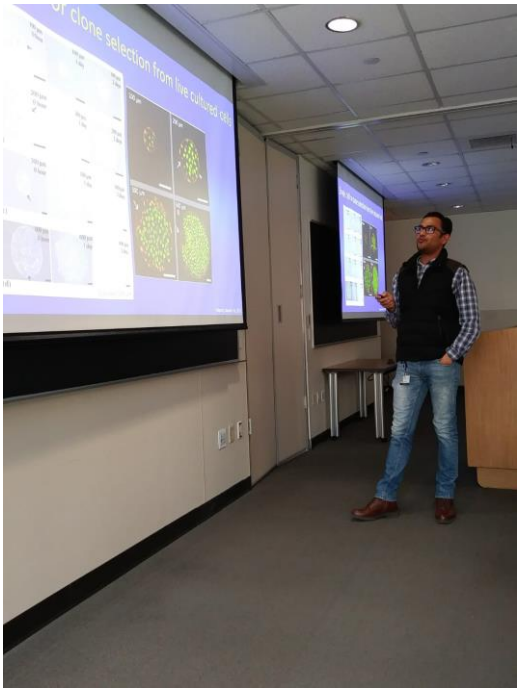
Technical Skills Seminar Series of 2019-2020

The Technical Skills Seminar Series (TSSS) is an important, professional development event organized by the JPA (Dr. Xi Chen) on a monthly basis. In academic year 2019-2020, the JPA was able to organize 6 seminars. Table 1 shows the list of topics covered and either the Jefferson postdocs that gave presentations and their departments or the external companies that participated in the TSSS.

Table 1: List of TSSS 2019-2020

No.	Title	Name and Department or Company
1	“Panacea of Cell Biology” xCELLigence Real Time Cell Analyser	Santosh Kumar Yadav Center for Translational Medicine
2	Genome Editing by CRISPR/Cas9 Delivery into Embryos in vivo by Oviductal Nucleic Acid Delivery (iGONAD)	Carolina Rezende Melo da Silva Microbiology and Immunology
3	Enhance Your Drug Discovery Workflow with FlexStation 3	Young Mee Yoon Molecular Devices
4	An Introduction to Data Analysis in SPSS using a Small Clinical Trial	Brandon George Jefferson College of Population Health
5	Laser Captured Microdissection: Microscopic dissection method to select the specific cells for DNA/RNA or Protein Isolation	Shiv Poojan Dermatology and Cutaneous Biology
6	Liquid Chromatography-Mass Spectrometry Bioanalysis of Small Molecules in Biological Samples	Ankit Rochani Pharmaceutical Sciences
Upcoming Events		
7	Fluorescence In Situ Hybridization (FISH): Procedure and Applications	Daniela Muoio Biochemistry and Molecular Biology
8	Harnessing the Microbiome in Immunology and Oncology Research Applications	Terina Martinez Taconic Biosciences

On average 19 participants attended the TSSS. There are two upcoming seminars with details TBD provided in Table 1. If you have any topic suggestions for future TSSS, please email jpa@jefferson.edu. Postdocs interested in presenting technical seminars should contact Dr. Xi Chen, VP Career Development, JPA. Each postdoctoral speaker is awarded a $100 honorarium.



Speed Networking Event

Table 2: List of Mentors at the Speed Networking event

Name	Company	Position
Avital Lev, PhD	AACR	Associate Editor, Cancer Discovery
Jessica Monteith, PhD	ClinicalMind, LLC	Associate Medical Director
Vivienne Ho, PhD	Herspiegel Consulting	Manager
Annika Barber, PhD	Rutgers	Faculty
Jeffrey Klemens, PhD	Jefferson East Falls	Assistant Professor
Mansi Khanna, PhD	Synchrogenix	Regulatory Writer
Huong Huynh, PhD	FDA	Pharmacologist
Dominique Medaglio, PharmD, MS	Christiana Care	Senior Clinical Research
Matteo Cesaroni, PhD	Janssen	Senior Principal Data Scientist
Pinaki Datta, PhD	Teva Pharmaceuticals	Scientist
Elizabeth D. Sigety, JD	Fox Rothschild	Partner
Yvette Seger, PhD	Federation of American Societies for Experimental Biology	Deputy Director, Office of Public Affairs and Director of Science Policy
Jianbo Hu, PhD	Thomas Jefferson University	Associate Director of Technology Licensing
Josh Gorsky, MS	Aro Biotherapeutics	Associate Research Scientist

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

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