ABRF Research Agenda

Recent Studies and New Projects Planned for 2022

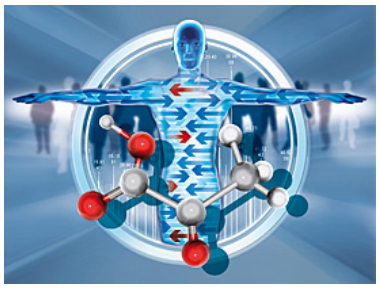
ABRF Research Groups bring together leaders in biomolecular sciences and techniques to attempt to answer questions or address challenges. Over the course of 12-18 months, these Groups conduct original research that often results in new findings, publications, and presentations at ABRF and other scientific meetings.

ABRF invites the support of corporate partners to contribute to these important projects, through in-kind donations of kits, reagents, and other research materials, or through direct financial support for shipping samples or select travel for Group members to collaborate in person. To augment ABRF's investment in these studies, ABRF has set a goal to raise at least **$25,000** in external support for these important projects, with recognition opportunities beginning at **$5,000**. All partners will be acknowledged for their contributions through the ABRF web site, during ABRF events, and within any resulting publications or presentations.

Recent studies, as well as those planned for this year, include:

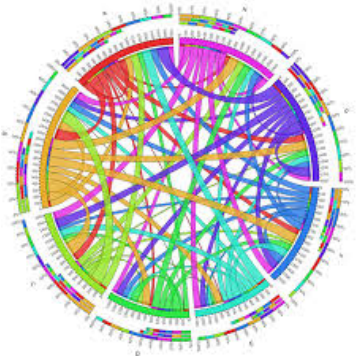
Compound Identification

Metabolomics Research Group (MRG)



The primary goal of this study is to provide quantifiable and citable evidence of the challenges of compound identification in metabolomics. Primary outcome measures will include:

- Overall success rate of accurate identification for each compound.
- Success rate stratified by database used (e.g. METLIN)



Estimating the Lowest DNA Input for Mitigating Confounding Contaminants in Library Preparation Kits Used for Shotgun Metagenomics

Metagenomics and Microbiome Research Group (MMRG)

Aims for 2022:

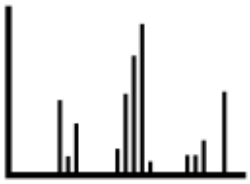
- Perform DNA dilution series to determine lowest input tolerated and analyze data for possible microbial contamination.

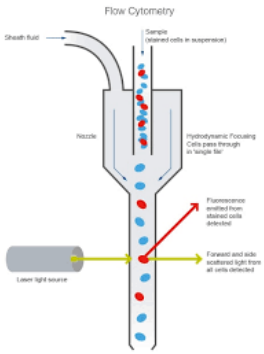
Evaluation of Software Tools for Cross-Linking Mass Spectrometry Data

Proteome Informatics Research Group (iPRG)

Aims for 2022:

- Provide participants with crosslinking mass spectrometry datasets (with static or cleavable crosslinkers) Along with example workflows and tutorials.
- Collect analyzed datasets and highlight the differences and challenges unique to static or cleavable crosslinkers when used to study the same proteins.
- Establish best practices for computational analysis of cross-linking mass spectrometry data.





Adapting Flow Cytometry Core Practices to Meet Today's Research Needs

Flow Cytometry Research Group

Aims for 2022:

The Flow Cytometry Research Group (FCRG) distributed a survey to the broader flow cytometry community in order to acquire a better understanding of how Flow Cytometry Cores are changing in response to various factors present in today's scientific investigative climate. These include training practices during the current COVID-19 pandemic, ability to recruit qualified core staff, availability of instrumentation and services, instrument service response times, and cytometry instrumentation placement into individual labs away from Flow Cores. All these factors affect not only the financial stability of a core, but also its sustainability. Survey responses are helping the FCRG create discussion groups around topics that are important to the Flow Community. FCRG projects for the next year include creation of Flow Cytometry course curriculum for community college technical training programs and development of SOPs for: antibody/dye titration and setting of Drop Delay based on particle size.

Investigating FFPE Conditions on Downstream Nucleic Acid Assays

DNA Sequencing Research Group (DSRG)

Formalin-fixed and paraffin-embedded (FFPE) tissue biospecimens are a valuable resource for clinical research; however, DNA and RNA isolated from FFPE biospecimens are often of lower quality, which can cause problems in some molecular applications, such as polymerase chain reaction(PCR) and next-generation sequencing (NGS). This challenge mostly stems from the fact that the fixation delay (perioperative ischemic time), the process of fixation and embedding, storage time, etc., have a profound effect on DNA/RNA quality. To make matters worse, there is not a universal standardized protocol for the process of FFPE tissue samples.

Aims for 2022:

- Aim 3. Further evaluating FFPE quality through gDNA amplifiability by qPCR.
- Aim 4 The multiplex end-point RT-PCR will be performed to assess the RNA quality.
- Aim 5.Targeted Capture Sequencing to assess whether artifactual mutation occurs during FFPE tissue preparation

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Multi-Species Standard to Assist Quantitative Proteomics

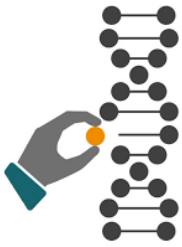
Proteomics Standards Research Group (sPRG)

Aims for 2022:

- Working with an industry partner, create a multi-species proteome digest material.
- Characterization of single species' proteomes and multi-species mixed proteome digests by members of the sPRG.
- Publish initial characterization in *JBT* and deposit data in public repositories.
- Community-based characterization of the material followed by a second publication and promotion.

There's More Than One Way to Make a Mutation: Comparison of Cas9, Cas12a, and Prime Editing

Genome Editing Research Group (GERG)



Aims for 2022:

- Compare the efficiency of point mutation generation using CRISPR with Cas9, Cas12a/Cpf1, and prime editing
- Compare the reproducibility of these experiments across multiple labs

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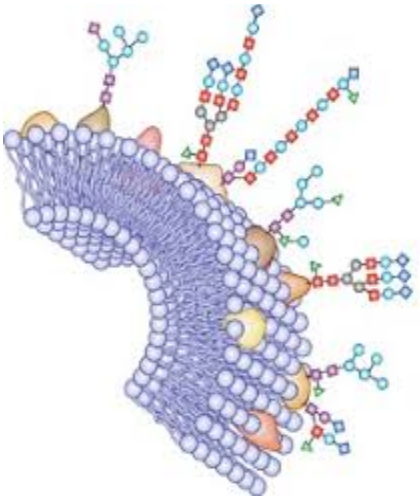

Using a ProteOmelette to Promote and Improve Glycoproteomic Techniques

Proteomics Research Group (PRG)

Aims for 2022:

- Evaluate the suitability of egg-white to provide sufficiently complex glycopeptides.
- Distribute egg-white digest to PRG members for data acquisition on different mass spectrometers.
- Present pilot results at 2022 ABRF Annual meeting in Palm Springs, CA and announce study.
- Community glycoproteomic analysis of the lyophilized egg-white glycoproteomic digest.
- Compile and publish results in *JBT*.

ABRF provides initial funding for these projects. With additional support, each study has the potential to be expanded to include greater data collection and analysis.

Visit the ABRF web site for more information on ABRF Research Groups. To support this valuable work, contact ABRF Executive Director Ken Schoppmann to discuss how your group can be involved.