# REGIONAL MEETING
## MINNEAPOLIS, USA
## NOVEMBER 3-5 2019

# FINAL PROGRAM

***Times They Are a Changin': Biobanks for the Future***

isber

INTERNATIONAL SOCIETY FOR BIOLOGICAL AND ENVIRONMENTAL REPOSITORIES

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INTERNATIONAL SOCIETY FOR BIOLOGICAL AND ENVIRONMENTAL REPOSITORIES

# *Times They Are a Changin': Biobanks for the Future*

## ISBER 2019 NORTH AMERICA REGIONAL MEETING & EXHIBITS

*November 3-5, 2019 • Minneapolis, MN, USA*

**ISBER MISSION**

ISBER is a global biobanking organization which creates opportunities for networking, education, and innovations and harmonizes approaches to evolving challenges in biological and environmental repositories.

**ISBER VISION**

ISBER will be the leading global biobanking forum for promoting harmonized high-quality standards, education, ethical principles, and innovation in the science and management of biorepositories.

**International Society for Biological and Environmental Repositories**
750 Pender Street, Suite 301, Vancouver, BC V6C 2T7 Canada | T 604.484.5693 | F 604.874.4378

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# Contents

# Message from the ISBER President and Scientific Program Committee Co-Chairs

Dear colleagues and friends,

This year the International Society of Biological and Environmental Repositories (ISBER) is celebrating an important milestone, its 20th anniversary. It represents more than just a passage of time and persistence, but also the culmination of two decades of creativity, innovation and growth. This anniversary provides an opportunity to reflect upon the cherished memories of years gone by while celebrating another year of serving our members, community, and successes.

As we continue our 20th year celebration after an incredible conference in Shanghai, China, the ISBER Board of Directors and the Co-Chairs of the 2019 Americas Regional Meeting welcome you to Minneapolis, MN and hope you have an enjoyable and interesting three days filled with thought provoking presentations, stimulating conversations and fun networking! The city is home to the largest health technology cluster in the United States, with over 350 medical device companies calling this area home. In honor of Bob Dylan, a native of Minnesota, the Scientific Program Advisory Committee chose "Times they are a changin': Biobanks for the Future" as this regional meeting theme. The theme of the conference, influenced by titles of Bob Dylan's extensive music catalog, are threaded throughout the meeting symposia.

In keeping with the theme, the regional program will focus on the evolving composition of biobanks and their progressive involvement in research. Biobanks now encompass much of the developing digital world and the regional meeting reflects this by focusing on digital biobanking and the collection of data for research from wearable technology. Biobanks have also expanded to developing living biobanks of cells, disease models, microbiomes and reprogrammed cells – each with complex challenges in maintaining these biobanks for future research. This changing face of biobanking is highlighted by the addendum to the fourth edition of the ISBER Best Practices. This addendum builds upon previous editions of the Best Practices of 2005, 2008, 2012, and 2018 and focuses on the liquid nitrogen (LN2)-based cryogenic storage of living biological and environmental specimens for research and clinical use.

## PRECONFERENCE WORKSHOP

New to biobanking? This year, we are offering Biobanking 101 (additional registration required) as a preconference workshop held on Sunday, November 3rd which will introduce practical knowledge on the construction of consents, cold chain management, and harmonizing repository practice.

Participants will have the opportunity to learn about use of tools developed by ISBER to help set up and manage biobanks. Joanne Demchok (National Cancer Institute) will focus on one of ISBER's tools, the International Repository Locator. Information will be provided about various repository locators and how tools can be accessed and utilized.

Obtaining informed consent for the collection and use of biospecimens can be a tremendous challenge and will be the second topic covered. Helena Ellis (Biobanking Without Borders, LLC) will be will be conducting a session on "How to write a Biobanking Informed Consent Document". This workshop will provide easy to implement instructions to write clear biobanking consent forms based on best practices and will help participants understand both challenges and best practices for writing an informed consent document.

Quality and stability of a biospecimen requires proper cold chain management. This will be the third topic covered. Kathi Shea (Brooks Life Sciences) will discuss various methods, tools and best practices for cold chain management. Breakout discussions will help participants to address specific questions and network with other biobankers.

Sunday will end with a welcome reception for all attendees and roundtable discussions hosted by experts.

## PROGRAM HIGHLIGHTS

The three day program includes roundtable discussions, a welcome reception, eight symposia sessions, two contributed paper sessions, four educational workshops, a networking reception, and numerous opportunities to network and learn more from our corporate sponsors at workshops and the exhibit hall booths.

The first full day of the program, Monday, is kicked off by an opening address by Debra Garcia, 2019-2020 ISBER President, followed by the keynote speaker Abasi Ene-Obong, CEO and founder of 54gene, who will provide perspective on building a pan-African biobank to promote genomic diversity in population health research.

Following the keynote is plenary Symposium 1: Bringing it back…to the Community: Banking on Diversity and Sharing/All of Us Spotlight and Symposium 2: All Along the Watch Tower: Wearable Data Tracking and Direct to Consumer Genetics Data. The program continues with Corporate Workshops 1 & 2, lunch in the exhibit hall, and Corporate Workshops 3 & 4.

The afternoon sessions open with Symposium 3: Don't Think Twice, it's Alright! There are Many Roads to Sustainability and concurrent Symposia 4A: Tangled up in Trypan Blue: Living Biobanks and Symposia 4B: All I Really Want to Do…is Share Data With You: Regulations for Data Sharing and International Collaborations. Monday concludes with an evening networking reception and simultaneous poster session.

Monday will end with a networking event for all attendees.

Tuesday opens with Symposium 5: Forever Young? Biospecimen Quality to Ensure Longevity, followed by the contributed paper sessions and a sponsored lunch symposium. The day concludes with concurrent sessions Symposium 6A: Shelter from the Storm: Keeping Biospecimens Alive and Symposium 6B: Integrating Digital Biospecimens: Don't Leave Them "Blowin' in the Wind" and the closing ceremony.

Four educational workshops will also be offered on Tuesday, November 5th: Consent for Future Use of Biospecimens Under the Revised Common Rule; Pitching Biobanking; If it's Fitness-for-Purpose You're Chasing…The Tools, They are a Changin: Leveraging Standards, ISBER Tools and Other Resources; Irreproducible Research Based on Human Biospecimens: Can New Models of Bioresources Ameliorate This Problem?

Please join us for this important opportunity to learn with your colleagues as we reflect on modern and future repository challenges in the closing months of ISBER's 20th anniversary.

## SOCIAL EVENTS

The conference is set in downtown Minneapolis. The Stone Arch Bridge is a short walk away from the conference venue with a spectacular view of the Mississippi River and the Saint Anthony Falls. The sunsets on the bridge are spectacular. Minneapolis is also home to a large number of breweries and distilleries combined with a vibrant restaurant scene. If you choose to pursue your musical interests, a visit to Paisley Park, Prince's private estate and music production complex is warranted.

## ACKNOWLEDGEMENTS

We would like to thank our invited speakers and workshop presenters for their generous contributions to the program. Additional thanks are due to the many ISBER volunteers whose hands-on involvement in the planning and implementation process made the program possible. Members of the ISBER 2019 Regional Meeting and Scientific Program Committee, as well as the Organizing Advisory Committee (OAC), contributed a tremendous amount of time and effort in the last year, resulting in the wonderful program we will soon experience. Additional assistance was provided by the Education and Training Committee who worked so hard to organize the pre-conference and educational workshops.

We would also like to give a special acknowledgement to Marianne Henderson for her tremendous support and guidance to this year's program committee. Marianne will be stepping down as the OAC's Chairperson after 6.5 years of service.

We greatly appreciate the support received from our vendors and sponsors, whose participation also made the meeting possible. Please visit the exhibition hall to support the vendors and check out the corporate workshops throughout the meeting schedule.

Finally, we would like to thank the ISBER Heard Office staff under the direction of Ana Torres for their continual support and guidance.

Your feedback is very important to ISBER. The regional meeting is developed and produced by volunteer membership and the success of future meetings relies on your participation and input. As a reminder, please complete the electronic survey at the end of the meeting.

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*(Term ended September 30, 2019)*

Zisis Kozlakidis, *BSc, PhD, AKC, MBA, FLS*
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Kathi Shea

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Wendy Wolf

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## ISBER WORKING GROUPS

- Biospecimen Science
- Enviro-Bio
- Informatics
- International Repository Locator
- Pharma
- Rare Diseases
- Regulatory and Ethics

## ISBER SPECIAL INTEREST GROUPS

- Automated Repositories
- Hospital-Integrated Biorepositories
- Living Biobanking
- Pediatric
- Understanding Our Donors

# ISBER WOULD LIKE TO ACKNOWLEDGE EACH OF ITS COMMITTEES AND THANK THE VOLUNTEERS FOR THEIR HARD WORK.

- Communications Advisory Committee
  *(Currently Recruiting)*
- Education and Training Advisory Committee
- Marketing Advisory Committee
  *(Currently Recruiting)*
- Member Relations Advisory Committee
  *(Currently Recruiting)*
- Organizing Advisory Committee
  - ↳ *Scientific Program Committee*
    *(2021 SPC Currently Recruiting)*
- Science Policy Advisory Committee
- Standards Committee

***Are you interested in helping to lead and form the direction of the organization? Are you interested in joining colleagues from around the world to shape the organization? All ISBER members are eligible to participate on a committee. If you are interested, please reach out to info@isber.org.***

## VISIT WWW.ISBER.ORG FOR MORE INFORMATION

# General Information

## VENUE

**Renaissance Minneapolis Hotel, The Depot**
225 3rd Avenue South
Minneapolis, MN 55401, USA
Phone: +1 612-375-1700

## REGISTRATION DESK HOURS OF OPERATION

| | |
|---|---|
| **Sunday, November 3** | 12:00pm – 1:00pm<br>4:00pm – 7:00pm |
| **Monday, November 4** | 7:00am – 7:00pm |
| **Tuesday, November 5** | 7:00am – 5:30pm |

## SPEAKERS SERVICES HOURS OF OPERATION

| | |
|---|---|
| **Sunday, November 3** | 4:00pm – 7:00pm |
| **Monday, November 4** | 7:00am – 5:00pm |
| **Tuesday, November 5** | 7:00am – 3:45pm |

## EXHIBIT HALL

| | |
|---|---|
| **Exhibit Installation:** | |
| **Sunday, November 3** | 10:00am – 5:30pm |
| **Exhibit Take Down:** | |
| **Tuesday, November 5** | 3:45pm – 8:00pm |
| **Exhibit Hours:** | |
| **Sunday, November 3** | 6:30pm – 8:00pm |
| **Monday, November 4** | 9:30am – 8:00pm |
| **Tuesday, November 5** | 9:00am – 3:45pm |

## CERTIFICATES OF ATTENDANCE

All attendees will receive a certificate of attendance after completion of the post-conference evaluation. The evaluation will be distributed via email following the meeting.

## WI-FI

**Network:** Renaissance_CONFERENCE
**Conference Code:** Anaheim2020

## POSTER PRESENTATION INFORMATION:

| | |
|---|---|
| **Poster Set-Up:** | |
| **Sunday, November 3** | 6:00pm – 6:30pm |
| **Poster Tear-Down:** | |
| **Tuesday, November 5** | 3:15pm – 3:45pm |

## REGISTRATION RATES *(PRICES IN USD)*

All delegates are encouraged to register for the meeting prior to arriving on-site, though on-site registrations will be accepted.

| | Regular Rate | On-Site Rate |
|---|---|---|
| **ISBER Member** | $395 | $445 |
| **Non-ISBER Member** | $495 | $545 |
| **Student/Technician** | $295 | $345 |
| **Exhibit Hall Pass** | $150 | $150 |

**Full conference registration** includes participation in scientific symposia and sessions, educational workshops (not including pre-conference workshop: Biobanking 101), a delegate bag, refreshment and conference meals, and invitation to all networking events.

**Exhibit hall pass** includes access to the exhibit hall, conference meals served in the exhibit hall, and access to all networking events.

## NETWORKING EVENTS

All delegates are invited and encouraged to attend the two networking receptions:

| | |
|---|---|
| **Welcome Reception** | **Sunday, November 3,**<br>6:30pm – 8:00pm |
| **Networking and Poster Reception** | **Monday, November 4,**<br>6:30pm – 8:00pm |

## PRE-CONFERENCE WORKSHOP: BIOBANKING 101

**Date:** Sunday, November 3, 1:00pm – 5:00pm
**Registration Fee:** $95 USD

Pre-registration is required. Further details can be found on page 30.

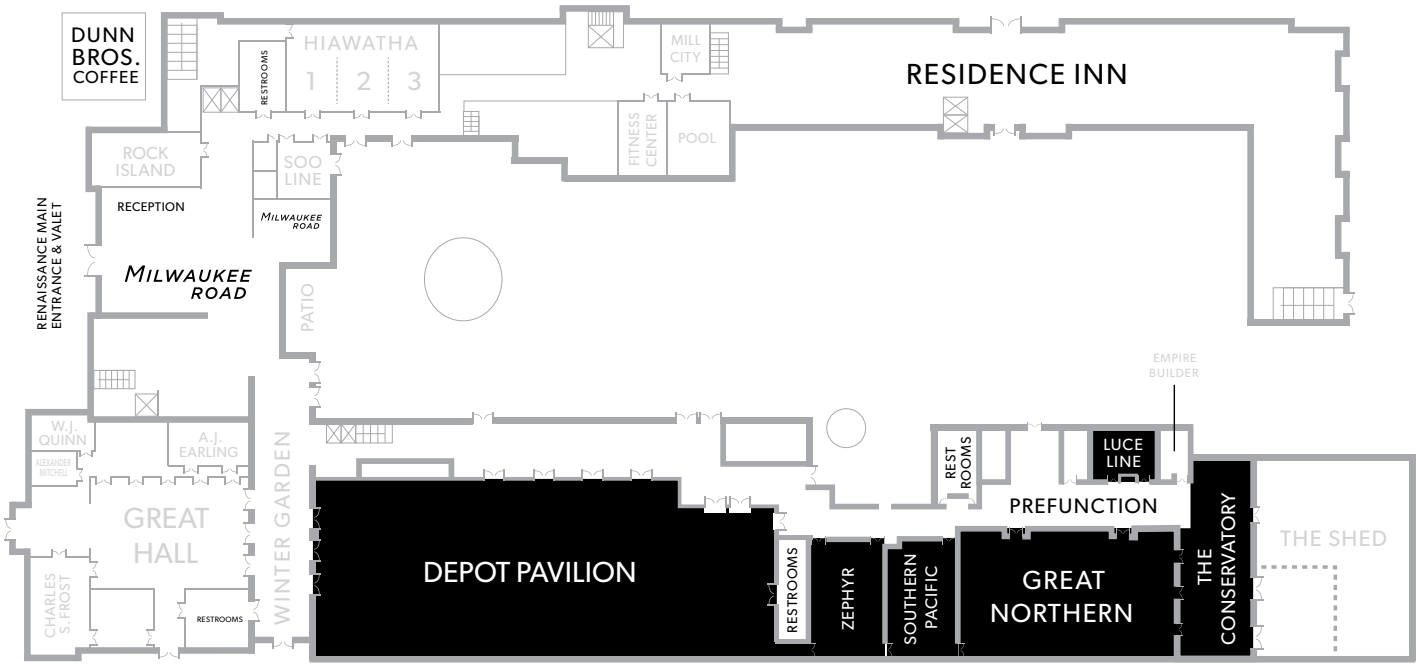
## "MEET THE VENDORS" EXHIBIT HALL ACTIVITY

Get to know our vendors, answer a few questions, and enter for a chance to win:

**Grand Prize – $250 gift card**
**2nd Place Prize – $150 gift card**
**1 of 12 Runner Up Prizes – $25 gift card**

To access the vendor survey, visit:
**www.isber.org/isbersurvey**

## Venue Map




# isber2020
# APRIL 14-18
## Annual Meeting & Exhibits

## *Roadmap to Accelerating Scientific Discovery*

**Biobanks have been portrayed as having the promise to unlock biological processes and promote a better tomorrow. Following the advent of the human genome project, biobanks have become the bedrock to accelerating scientific discoveries. Stemming from the success stories is a blueprint that places the biobank community at the forefront of research infrastructure for many generations to come.**

**In April 2020, global leaders and disruptors from the broad spectrum of the scientific community will converge in the largest international biobank conference, ISBER 2020, to address the impact of biobanks on science and how the related discoveries are establishing a roadmap to extend our knowledge network. From engaging with vulnerable populations to advances in artificial intelligence, experts at ISBER 2020 will highlight critical advances in biobanking and, for the first time, host a debate to discuss the utilization of samples and data in the modern era.**

**Our ability to transform health and research depends on the voices of all individuals willing to contribute and challenge the roadmap that biobanks are paving. Will you be part of the solution?**

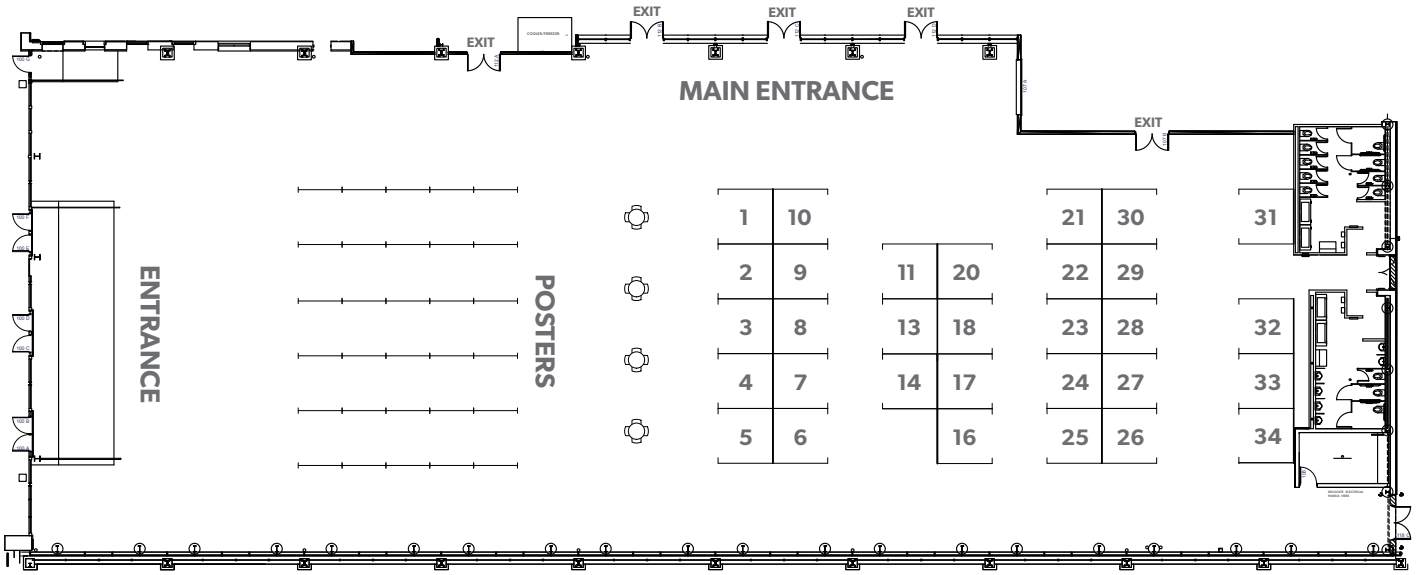
## REGISTER NOW

**Join us at the Anaheim Marriott, we'd love to see you there.**

Late Breaking Abstract Submission Opening Soon! Watch Your Inbox.

**VISIT MEETINGS.ISBER.ORG/2020 FOR MORE INFORMATION**

# Exhibit Hall Floor Map




# Exhibitor Listing

| Company Name | Booth # |
|---|---|
| A2LA | 14 |
| Abbott Informatics | 5 |
| Agilent Technologies | 25 |
| Autoscribe Informatics, Inc. | 30 |
| Bahnson Environmental Specialties, LLC | 16 |
| Bluechiip Limited | 18 |
| Brooks Life Sciences | 11 & 20 |
| Bruker BioSpin Corporation | 22 |
| BSI Systems | 1&10 |
| College of American Pathologists | 17 |
| CORIS Life Sciences Monitoring, Inc. | 32 |
| Cryotherm | 2 |
| Ellab, Inc. | 23 |
| Farrar Scientific | 13 |

| Company Name | Booth # |
|---|---|
| Fluidigm | 9 |
| Freezerworks | 6 |
| Hamilton Storage | 21 |
| ISBER | 27 & 28 |
| iSpecimen | 4 |
| KAYE | 7 |
| Liconic | 34 |
| Micronic/NBS Scientific | 24 |
| OpenSpecimen | 8 |
| PHC Corporation of North America | 26 |
| Scinomix | 33 |
| Thermo Fisher Scientific, Inc. | 29 |
| TTP Labtech | 31 |
| Ziath LLC | 3 |

# Meeting-at-a-Glance

| SUNDAY, NOVEMBER 3, 2019 | | |
|---|---|---|
| 8:00am – 1:00pm | ISBER Board and Committee Chair Meeting *(Invitation only)* | *Rock Island* |
| 1:00pm – 5:00pm | ISBER Board Meeting *(Invitation only)* | *Rock Island* |
| 10:00am – 5:30pm | Exhibit Installation | *Depot Pavilion* |
| 12:00pm – 1:00pm | Registration Open | *Great Northern Prefunction* |
| 1:00pm – 5:00pm | **PRE-CONFERENCE WORKSHOP: BIOBANKING 101** *(pre-registration required)* | *Zephyr* |
| 4:00pm – 7:00pm | Registration Open | *Great Northern Prefunction* |
| 4:00pm – 7:00pm | Speaker Services Open | *Luce Line* |
| 5:30pm – 6:30pm | **ROUND TABLE DISCUSSIONS** | *The Conservatory* |
| 6:00pm – 6:30pm | Poster Installation | *Depot Pavilion* |
| 6:30pm – 8:00pm | **WELCOME RECEPTION WITH EXHIBITS** | *Depot Pavilion* |

| MONDAY, NOVEMBER 4, 2019 | | |
|---|---|---|
| 7:00am – 7:00pm | Registration Open | *Great Northern Prefunction* |
| 7:00am – 5:00pm | Speaker Services Open | *Luce Line* |
| 7:00am – 8:00am | Coffee and Pastries | *Great Northern Prefunction* |
| 8:00am – 9:45am | **SYMPOSIUM 1** | *Great Northern* |
| 9:30am – 8:00pm | Exhibits Open | *Depot Pavilion* |
| 9:45am – 10:15am | Networking Break in Exhibit Hall | *Depot Pavilion* |
| 10:15am – 11:45am | **SYMPOSIUM 2** | *Great Northern* |
| 12:00pm – 1:00pm | **CORPORATE WORKSHOP 1: OPENSPECIMEN** | *Southern Pacific* |
| 12:00pm – 1:00pm | **CORPORATE WORKSHOP 2: BROOKS LIFE SCIENCES & PERKIN ELMER** | *Zephyr* |
| 12:00pm – 2:45pm | Networking Lunch Break in Exhibit Hall *(lunch served from 12:00pm – 1:45pm)* | *Depot Pavilion* |
| 1:30pm – 2:30pm | **CORPORATE WORKSHOP 3: BRUKER BIOSPIN** | *Southern Pacific* |
| 1:30pm – 2:30pm | **CORPORATE WORKSHOP 4: TTP LABTECH** | *Zephyr* |
| 2:45pm – 4:15pm | **SYMPOSIUM 3** | *Great Northern* |
| 4:15pm – 4:45pm | Networking Break in Exhibit Hall | *Depot Pavilion* |

## MONDAY, NOVEMBER 4, 2019

| | | |
|---|---|---|
| 4:45pm – 6:30pm | **SYMPOSIUM 4A** | *Great Northern* |
| 4:45pm – 6:30pm | **SYMPOSIUM 4B** | *Zephyr* |
| 6:30pm – 8:00pm | **NETWORKING RECEPTION AND POSTER SESSION** | *Depot Pavilion* |

## TUESDAY, NOVEMBER 5, 2019

| | | |
|---|---|---|
| 7:00am – 5:30pm | Registration Open | *Great Northern Prefunction* |
| 7:00am – 3:45pm | Speaker Services Open | *Luce Line* |
| 7:00am – 8:00am | Coffee and Pastries | *Great Northern Prefunction* |
| 8:00am – 9:30am | **SYMPOSIUM 5** | *Great Northern* |
| 8:00am – 9:30am | **EDUCATIONAL WORKSHOP 1** | *Zephyr* |
| 9:00am – 3:45pm | Exhibits Open | *Depot Pavilion* |
| 9:30am – 10:00am | Networking Break in Exhibit Hall | *Depot Pavilion* |
| 10:00am – 11:30am | **CONTRIBUTED PAPER SESSION 1 & 2** | *Southern Pacific & Zephyr* |
| 11:45am – 1:15pm | **AGILENT TECHNOLOGIES CORPORATE LUNCH SYMPOSIUM** | *Great Northern* |
| 11:45am – 1:15pm | General Lunch in Exhibit Hall | *Depot Pavilion* |
| 1:30pm – 3:15pm | **SYMPOSIUM 6A** | *Great Northern* |
| 1:30pm – 3:15pm | **SYMPOSIUM 6B** | *Zephyr* |
| 3:15pm – 3:45pm | Networking Break in Exhibit Hall | *Depot Pavilion* |
| 3:15pm – 3:45pm | Poster Take-Down | *Depot Pavilion* |
| 3:45pm – 5:15pm | **EDUCATIONAL WORKSHOPS 2, 3 & 4** | *Great Northern, Southern Pacific & Zephyr* |
| 3:45pm – 8:00pm | Exhibit Take-Down | *Depot Pavilion* |
| 5:15pm – 5:30pm | Closing Ceremony | *Great Northern* |

# Meeting Program

## SUNDAY, NOVEMBER 3, 2019

| | | | |
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| 8:00am – 1:00pm | ISBER Board of Directors and Committee Chairs Meeting *(Invitation only)* | | *Rock Island* |
| 1:00pm – 5:00pm | ISBER Board of Directors Meeting *(Invitation Only)* | | *Rock Island* |
| 10:00am – 5:30pm | Exhibit Installation | | *Depot Pavilion* |
| 12:00pm – 1:00pm | Registration Open | | *Great Northern Prefunction* |
| 1:00pm – 5:00pm | **PRE-CONFERENCE WORKSHOP: BIOBANKING 101** *(pre-registration required)*<br>***Chairs:*** *Judita Kinkorova, Tim Sharp* | | *Zephyr* |
| | 1:00pm – 1:05pm | Introduction | |
| | 1:05pm – 1:20pm | ISBER Tools Highlight: International Repository Locator<br>***Joanne Demchok****, National Cancer Institute* | |
| | 1:20pm – 2:30pm | How to Write an Informed Consent Document<br>***Helena Ellis****, Biobanking Without Borders* | |
| | 2:30pm – 2:45pm | Networking Break | |
| | 2:45pm – 3:55pm | Cold Chain Management<br>***Kathi Shea****, Brooks Life Sciences* | |
| | 3:55pm – 5:00pm | Breakout Discussion (Interactive Groups) | |
| 4:00pm – 7:00pm | Registration Open | | *Great Northern Prefunction* |
| 4:00pm – 7:00pm | Speaker Services Open | | *Luce Line* |
| 5:30pm – 6:30pm | **ROUND TABLE DISCUSSIONS** | | *The Conservatory* |
| | Blood for Collection (B4C) Workgroup: A Multicenter Collaboration Investigating Blood Collection Volumes in Human Research<br>*Facilitator:* ***Hanluen Kuo****, The University of Kansas Cancer Center* | | |
| | Biosamples Open Governance Using Blockchain<br>*Facilitator:* ***Daniel Uribe****, Genobank.io* | | |
| | Sample Reconciliation - Challenges and Solutions<br>*Facilitator:* ***Cathy Seiler****, Kaleido Biosciences* | | |
| | Living Biobank Special Interest Group - Goals and Directions<br>*Facilitator:* ***Jedediah Lewis****, Organ Preservation Alliance* | | |
| 6:00pm – 6:30pm | Poster Installation | | *Depot Pavilion* |
| 6:30pm – 8:00pm | **WELCOME RECEPTION WITH EXHIBITS** | | *Depot Pavilion* |
| | Join us for refreshments and hors d'oeuvres in the exhibit hall while networking with colleagues and exhibitors, and perusing the abstract posters. | | |

## MONDAY, NOVEMBER 4, 2019

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|---|---|---|
| 7:00am – 7:00pm | Registration Open | *Great Northern Prefunction* |
| 7:00am – 5:00pm | Speaker Services Open | *Luce Line* |
| 7:00am – 8:00am | Coffee and Pastries | *Great Northern Prefunction* |

## MONDAY, NOVEMBER 4, 2019

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|---|---|---|
| 8:00am – 9:45am | **SYMPOSIUM 1: BRINGING IT BACK… TO THE COMMUNITY: BANKING ON DIVERSITY & SHARING/ALL OF US SPOTLIGHT**<br>***Chairs:*** *Allison Hubel, Rita Lawlor, Billy Schleif* | *Great Northern* |

Prevention and precision medicine for all relies on biobanks and research studies that include specimens from diverse populations to answer questions that are generalizable and specific for certain populations. Inclusion of diverse, underserved and specialized populations in research requires special attention to governance structures and active approaches to community engagement. Attention to privacy and trust relationships is a significant element of success. This symposium will discuss the opportunities and challenges in precision medicine and prevention for all, community engagement, IRB governance with a highlight on the activities of All of Us Cohort and other large studies that impact communities.

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| 8:00am – 8:10am | ISBER Welcome and Opening Remarks<br>*Debra Garcia, Allison Hubel, Rita Lawlor, Billy Schleif* |
| 8:10am – 8:35am | Keynote Lecture: Increasing Precision in Medicine: Accessing the Most Genetically Diverse Continent<br>***Abasi Ene-Obong****, 54gene* |
| 8:35am – 8:55am | The Networked Approach to Biorepository Science: Big Opportunities and Big Challenges<br>***Aaron Goldenberg****, Case Western Reserve University;* ***Kyle Brothers****, University of Louisville* |
| 8:55am – 9:25am | Every Specimen Has a Story: Engaging with Biobanking Community Advisory Boards<br>***Karen Meagher****, Mayo Clinic;* ***David Kotsonas****, Community Advisory Board;* ***Betty Smith****, Community Advisory Board* |
| 9:25am – 9:45am | **Panel Discussion** |

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|---|---|---|
| 9:30am – 8:00pm | Exhibits Open | *Depot Pavilion* |
| 9:45am – 10:15am | Networking Break in Exhibit Hall | *Depot Pavilion* |
| 10:15am – 11:45am | **SYMPOSIUM 2: ALL ALONG THE WATCH TOWER: WEARABLE DATA TRACKING AND DIRECT TO CONSUMER GENETICS DATA**<br>***Chairs:*** *Helena Ellis, Rita Lawlor* | *Great Northern* |

The digital health industry has sprung up quickly in recent years. Easy access to direct to consumer genetics for ancestry and health risk analysis, personal digital health trackers to monitor constantly vital statistics, and lifestyle have contributed significantly to this growth. In 2018, it was predicted that venture capitalists and health systems would invest in the region of $7 billion in digital health solutions including wearables and biosensors like Fitbits, precision medicine and genomics, mobile diagnostics, and clinical decision support via telemedicine. Whilst the FDA regulates medical devices, it does not regulate all genetic services or wearable devices.

Wearable data tracking and direct to consumer genetics data have many elements in common. They enable the individual to produce vast amounts of health-related data that are an incredible source of data for research and public health, they raise privacy concerns, and they open a market for individual selling of personal data. In this session, we will discuss the implications of such bio-voyeurism, whether (and how) such data should be shared and banked for future research use and the challenges to be overcome to facilitate such sharing. We will address potential policy gaps and self-regulation recommendations required to ameliorate privacy concerns and other ethics and governance issues related to big data banking.

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| 10:15am – 10:35am | Wireless Health and Performance Monitoring Systems<br>***Azar Alizadeh,*** *GE Research* |
| 10:35am – 10:55am | Digitizing the Patient: Objective Data that Complements Biobanks<br>***Jorge Nieva****, USC/Norris Cancer Center* |
| 10:55am – 11:15am | Direct-to-Consumer Genetic Testing: Promise, Pitfalls & Perils<br>***Ellen Matloff****, My Gene Counsel* |
| 11:15am – 11:45am | Panel Discussion |

## MONDAY, NOVEMBER 4, 2019

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|---|---|---|
| 12:00pm – 1:00pm | **CORPORATE WORKSHOP 1: OPENSPECIMEN - WORLD'S MOST WIDELY USED OPEN SOURCE BIOSPECIMEN MANAGEMENT SOFTWARE**<br>***Srikanth Adiga,*** *OpenSpecimen* | *Southern Pacific* |
| 12:00pm – 1:00pm | **CORPORATE WORKSHOP 2: THE IMPORTANCE OF SAMPLE MANAGEMENT IN PRECISION MEDICINE: A HIGH-THROUGHPUT BIOBANKING WORKFLOW SOLUTION**<br>***Andrew Brooks****, RUCDR, Brooks Life Sciences;* ***Mark Dupal****, PerkinElmer Applied Genomics* | *Zephyr* |
| 12:00pm – 2:45pm | Networking Lunch Break in Exhibit Hall *(lunch served from 12:00pm – 1:45pm)* | *Depot Pavilion* |
| 1:30pm – 2:30pm | **CORPORATE WORKSHOP 3: ADVANTAGES OF SOP-BASED NMR DIAGNOSTICS FOR THE QUALITY AND FUTURE-PROOFING OF BIOBANK SAMPLES**<br>***Eduardo Nascimento,*** *Bruker BioSpin Corp.* | *Southern Pacific* |
| 1:30pm – 2:30pm | **CORPORATE WORKSHOP 4: CAN YOU JUSTIFY AUTOMATING YOUR STORAGE?**<br>***Issa Issac,*** *TTP Labtech;* ***Paul Lomax,*** *TTP Labtech* | *Zephyr* |
| 2:45pm – 4:15pm | **SYMPOSIUM 3: DON'T THINK TWICE, IT'S ALRIGHT! THERE ARE MANY ROADS TO SUSTAINABILITY**<br>***Chair:*** *Marianne Henderson*<br>**Facilitators:** *Helena Ellis, Daniel Simeon-Dubach* | *Great Northern* |

Sustainability is a complex and ongoing challenge for most biobanks around the world. A biobank's mission, sample types, numbers and types of stakeholders served and source(s) of funding, impacts the importance of sustainability in a biobank's business plan. Furthermore, sustainability issues encompass all financial, social and operations aspects of a biobank. This session will be an interactive moderated discussion with representatives of four different Minnesota biobanks across biobanking sectors, including human, non-human and environmental samples that have achieved sustainability. Each speaker will clearly describe their biobank's mission, essential elements, sample and stakeholder statistics and operating principles. The moderator will engage with all speakers in a 'talk show style' to elicit information of how they define successful sustainability and the challenges and lessons learned in achieving it. Audience participation will be encouraged.

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| 2:45pm – 2:55pm | Introduction<br>***Marianne Henderson,*** *National Cancer Institute* |
| 2:55pm – 3:35pm | Setting the Stage: Sustainable Biobanks in Minnesota<br>***Keith Barker,*** *Bell Museum of Natural History;* ***Cole Drifka,*** *Biorepository and Laboratory Services (BLS), University of Minnesota;* ***Bharat Thyagarajan,*** *Advanced Research and Diagnostics Laboratory, University of Minnesota;* ***Mine Çiçek,*** *Mayo Clinic Bioservices* |
| 3:35pm – 4:15pm | Interactive Panel Discussion |

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| 4:15pm – 4:45pm | Networking Break in Exhibit Hall | *Depot Pavilion* |

## MONDAY, NOVEMBER 4, 2019

4:45pm – 6:30pm

### SYMPOSIUM 4A: TANGLED UP IN TRYPAN BLUE: LIVING BIOBANKS

*Great Northern*

***Chairs:*** *Allison Hubel, Xuefeng Liu*

Tissues, gametes and isolated cells from humans, plants and animals may be preserved in a manner as to preserve viability and function. Retaining viability and function for a biospecimen presents specific challenges for biobankers. This session is designed to address unique challenges of preserving specific high-value biospecimens as well as overall challenges with workflow, quality assessment and downstream uses of specimens from living biobanks.

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| 4:45pm – 5:15pm | PDX Mouse Models Integrated into a Precision Medicine Initiative for Ovarian Cancer<br>***Tim Starr,*** *University of Minnesota* |
| 5:15pm – 5:40pm | Genome Resource Banking of Genetically Modified Rodents and Current Challenges<br>***Yuksel Agca,*** *University of Missouri* |
| 5:40pm – 6:05pm | Developing an Off-the-Shelf Living Tissue Supply<br>***Jedediah Lewis,*** *Organ Preservation Alliance* |
| 6:05pm – 6:30pm | Cryopreservation of Cells and Spores by Encapsulation<br>***Alptekin Aksan,*** *University of Minnesota* |

4:45pm – 6:30pm

### SYMPOSIUM 4B: "ALL I REALLY WANT TO DO"… IS SHARE DATA WITH YOU: REGULATIONS FOR DATA SHARING AND INTERNATIONAL COLLABORATIONS

*Zephyr*

***Chairs:*** *Marianna Bledsoe, Amanda Moors*

Recent regulatory changes both in the USA and abroad contain requirements that may hinder data sharing and impede international research collaborations. Differences among the various regulations may cause conflicts in requirements for data handling once shared, due to the content and scope of the applicable regulations. As relating to human specimen research, the EU-General Data Protection Regulations recently implemented on May 25, 2018, has broad territorial reach outside of the EU and is significantly affecting multinational studies involving personal data from EU citizens or held by EU entities. While the regulations allow data sharing with countries such as the USA when there is appropriate legal basis, many of these approaches have considerable challenges. Furthermore, significant differences among the EU-GDPR, Common Rule and Health Insurance Portability and Accountability Act (HIPAA) are also creating implementation challenges for those wishing to share data internationally. The Nagoya Protocol contains requirements for movement of data and environmental and biological samples across international borders, as well as provisions for benefit back consideration for source locations of biological specimens. The implementation and the challenges to this regulatory framework will be presented.

This session will provide an overview of these challenges and discuss attempts at resolutions. In addition, case studies in international collaborations will be discussed as well as proposed approaches to address the challenges in an interactive panel session.

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| 4:45pm – 5:05pm | "I ain't lookin' to block you up": International Collaboration and Data Flow Under the EU GDPR<br>***Heidi Beate Bentzen,*** *University of Oslo* |
| 5:05pm – 5:25pm | Impact of US Privacy Law and GDPR on Data Sharing for Research Purposes<br>***David Peloquin,*** *Ropes & Gray LLP* |
| 5:25pm – 5:45pm | Rapidly Evolving Challenges and Opportunities of Access and Benefit Sharing (ABS) Rules for Biodiversity Collections and Research<br>***Scott Miller,*** *Smithsonian Institution* |
| 5:45pm – 6:30pm | Panel Discussion<br>*Additional participants: Rita Lawlor, Judita Kinkorova* |

6:30pm – 8:00pm

### NETWORKING RECEPTION AND POSTER SESSION

*Depot Pavilion*

Join us for refreshments and hors d'oeuvres in the exhibit hall while networking with colleagues, exhibitors, and poster presenters. Poster presenters will be by their posters and available for discussion from 6:30pm to 7:30pm.

## TUESDAY, NOVEMBER 5, 2019

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| 7:00am – 5:30pm | Registration Open | *Great Northern Prefunction* |
| 7:00pm – 3:45pm | Speaker Services Open | *Luce Line* |
| 7:00am – 8:00am | Coffee and Pastries | *Great Northern Prefunction* |
| 8:00am – 9:30am | **SYMPOSIUM 5: FOREVER YOUNG? BIOSPECIMEN QUALITY TO ENSURE LONGEVITY** *Great Northern*<br>***Chairs:*** *David Lewandowski, Amanda Riffel* | |
| | Biobanks are only as relevant as the specimens that are housed within them. Preanalytical variables have the power to change specimen quality and integrity, which can alter downstream data. This session will review why quality measures are relevant, highlight some of the current standards, and provide state-of-the-science preanalytical quality measures. Attendees should expect to learn how and why to formulate and implement a quality management program for their own repositories. | |
| | 8:00am – 8:05am | Introduction<br>***Amanda Riffel,*** *Children's Mercy Hospital* |
| | 8:05am – 8:25am | Defining Quality In Tissue Biospecimens<br>***Stephen Hewitt,*** *National Cancer Institute* |
| | 8:25am – 8:45am | What Is the Role of Pre-Analytical Variables on Thrombosis Biomarkers in a Diverse Population of Cancer Patients?<br>***Elizabeth Duffy,*** *Boston Medical Center* |
| | 8:45am – 9:05am | Delta-S-Cys-Albumin: A Lab Test that Quantifies Cumulative Exposure of Archived Human Blood Plasma and Serum Samples to Thawed Conditions<br>***Chad Borges,*** *Arizona State University* |
| | 9:05am – 9:30am | Question and Answer Session |
| 8:00am – 9:30am | **EDUCATIONAL WORKSHOP 1: CONSENT FOR FUTURE USE OF BIOSPECIMENS UNDER THE REVISED COMMON RULE** *Zephyr*<br>***Marianna Bledsoe,*** *Independent Consultant,* ***William Grizzle,*** *University of Alabama at Birmingham,* ***David Peloquin,*** *Ropes & Gray LLP* | |
| 9:00am – 3:45pm | Exhibits Open | *Depot Pavilion* |
| 9:30am – 10:00am | Networking Break in Exhibit Hall | *Depot Pavilion* |
| 10:00am – 11:30am | **CONTRIBUTED PAPER SESSION 1: GOTTA SERVE SOMEBODY – ETHICS AND STANDARDS** *Southern Pacific*<br>***Chairs:*** *Debra Garcia, Cheryl Michels* | |
| | Giving Patients, the Public, and Health-Care Providers a Voice in Pediatric Mental Health Biobanking<br>***James Shih,*** *BC Children's Hospital BioBank* | |
| | ISO TR 22758 Implementation Guide for ISO 20387--Deciphering the ISO 20387 Biobanking Standard<br>***Clare M. Allocca,*** *National Institute of Standards & Technology* | |
| | The Cost of Utilizing a Permission to Contact (PTC) Platform to Support Research: A Retrospective Access Example<br>***Karlene Carvalho,*** *BC Cancer Agency* | |
| | Analysis of Three Internationally Recognized Biobanking Standards<br>***Tamsin Tarling,*** *University of British Columbia* | |
| | Patients Enhancing Research Collaborations at Holden: The Consolidation of Disparate Biorepository Enrollment Procedures<br>***Laura Jacobus,*** *The University of Iowa* | |

## TUESDAY, NOVEMBER 5, 2019

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| 10:00am – 11:30am | **CONTRIBUTED PAPER SESSION 2: MODERN TIMES – DATA AND SCIENCE** *Zephyr*<br>***Chairs:*** *Ping Guan, Diane McGarvey* | |
| | Innovative Devices for Community-Based Development of Germplasm Repositories<br>***Yue Liu,*** *Louisiana State University* | |
| | BRoTHER – A Regional Biobank Network in Europe<br>***Judita Kinkorova,*** *University Hospital Pilsen* | |
| | NASA Institutional Scientific Collection (ISC) at Ames Research Center<br>***Ryan Scott,*** *NASA, Wyle Labs* | |
| | Human Lung Development from Canalicular Through Alveolar Stages Made Accessible by a Novel Pediatric Biorepository<br>***Gloria Pryhuber,*** *University of Rochester Medical Center* | |
| | Moffitt Cancer Center's Biospecimen Pilot Project Process: Improving Access to Biospecimens<br>***Edward R. Seijo,*** *H. Lee Moffitt Cancer Center* | |
| | Standardizing Pre-analytical Workflows for Deriving Cell Free DNA from Venous Whole Blood<br>***Jordan Lee Plieskatt,*** *The George Washington University* | |
| 11:45am – 1:15pm | **CORPORATE LUNCH SYMPOSIUM: IS YOUR CELL-FREE DNA SAMPLE FIT FOR PURPOSE? BIOBANK SAMPLES QC FROM AGILENT** *Great Northern*<br>***Elisa Viering,*** *Agilent Technologies;* ***Thorsten Voss,*** *PreAnalytiX GmbH;*<br>***Kyle Luttgeharm,*** *Agilent Technologies*<br>**Lunch will be served within this session*<br>Agilent Trusted Answers | |
| 11:45am – 1:15pm | General Lunch in the Exhibit Hall | *Depot Pavilion* |
| 1:30pm – 3:15pm | **SYMPOSIUM 6A: SHELTER FROM THE STORM: KEEPING BIOSPECIMENS ALIVE** *Great Northern*<br>***Chairs:*** *Daniel Simeon-Dubach, Amy Skubitz* | |
| | Keeping heterogeneous systems alive is a particular challenge for living biobanks. Speakers in this session will expand upon the challenges outlined in Symposium 4A to include challenges of preserving heterogeneous systems such as microbiome, human tumors and other biospecimens containing numerous cell types. | |
| | 1:30pm – 1:55pm | The RAMS Registry/Repository: Biobanking for Microbiome Research in Women's Reproductive Health and Pregnancy<br>***Gregory Buck,*** *Virginia Commonwealth University* |
| | 1:55pm – 2:20pm | Biobanks in LMIC: Global Efforts Needed to Foster Pediatric Cancer Research<br>***Rania Labib,*** *Children's Cancer Hospital-57357-Egypt* |
| | 2:20pm – 2:45pm | Conditionally Reprogrammed Normal and Tumor Cells – A Living Biobank – For Precision Medicine<br>***Xuefeng Liu,*** *Lombardi Comprehensive Cancer Center, Georgetown University* |
| | 2:45pm – 3:15pm | Panel Discussion |

## TUESDAY, NOVEMBER 5, 2019

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| 1:30pm – 3:15pm | **SYMPOSIUM 6B: INTEGRATING DIGITAL BIOSPECIMENS: DON'T LEAVE THEM "BLOWIN' IN THE WIND"**<br>***Chairs:*** *Stephen Hewitt, Cheryl Michels* | *Zephyr* |
| | Digital pathology, along with digital radiology imaging systems is becoming the new norm within clinical digital imaging. They are an incredible resource for immediate review of disease status and tissue samples. The session will focus on digital imaging from radiology and pathology and its potential as a biobanking and research resource to catalogue disease, track the progression of disease and/or recovery, and use as a diagnostic tool. This session will also explore the innovative area of digital imaging as a learning tool to develop artificial intelligent (AI) systems and the potential use of AI systems to provide quality control, analysis of sample composition and computer assisted evaluation of disease. | |
| | 1:30pm – 2:00pm: Advancing Digital Biobanking: Impact of Digital Pathology and Computational Pathology Tools<br>***Anil Parwani,*** *The Ohio State University* | |
| | 2:00pm – 2:25pm: Digital Pathology and AI – Future Opportunities<br>***Michael Feldman,*** *University of Pennsylvania Health System* | |
| | 2:25pm – 2:50pm: Diagnostic Consensus through Image Search – Lessons Learned from Searching in TCGA Repository of Whole Slide Images<br>***Hamid Tizhoosh,*** *Kimia Lab, University of Waterloo* | |
| | 2:50pm – 3:15pm: Establishing a Searchable Imaging Data Commons: Mining Digital Pathology and Tumor Imaging<br>***David Gutman,*** *Emory University* | |
| 3:15pm – 3:45pm | Networking Break in Exhibit Hall | *Depot Pavilion* |
| 3:15pm – 3:45pm | Poster Take-Down | *Depot Pavilion* |
| 3:45pm – 5:15pm | **EDUCATIONAL WORKSHOP 2: IRREPRODUCIBLE RESEARCH BASED ON HUMAN BIOSPECIMENS: CAN NEW MODELS OF BIORESOURCES AMELIORATE THIS PROBLEM?**<br>***William Grizzle,*** *University of Alabama at Birmingham;* ***Shannon McCall,*** *Duke University School of Medicine* | *Great Northern* |
| 3:45pm – 5:15pm | **EDUCATIONAL WORKSHOP 3: IF IT'S FITNESS-FOR-PURPOSE YOU'RE CHASIN'… THE TOOLS, THEY ARE A CHANGIN': LEVERAGING STANDARDS, ISBER TOOLS AND OTHER RESOURCES**<br>***Clare Allocca,*** *National Institute of Standards & Technology;* ***Marianna Bledsoe,*** *Independent Consultant;* ***Koh Furuta,*** *Council for Industrial Use of Biological and Environmental Repositories (CIBER)* | *Southern Pacific* |
| 3:45pm – 5:15pm | **EDUCATIONAL WORKSHOP 4: PITCHING BIOBANKING**<br>***Suzanne Vercauteren,*** *BC Children's Hospital Biobank;* ***Daniel Catchpoole,*** *The Tumour Bank – CCRU* | *Zephyr* |
| 3:45pm – 8:00pm | Exhibit Take-Down | *Depot Pavilion* |
| 5:15pm – 5:30pm | Closing Ceremony | *Great Northern* |

# Round Table Discussion Summaries

*The Conservatory*

Sunday, November 3 | 5:30pm – 6:30pm

## BLOOD FOR COLLECTION (B4C) WORKGROUP: A MULTICENTER COLLABORATION INVESTIGATING BLOOD COLLECTION VOLUMES IN HUMAN RESEARCH

***Facilitator: Hanluen Kuo,*** *The University of Kansas Cancer Center*

Originating from the ISBER 2018 Annual Meeting in Dallas, TX, we established a workgroup that has collected data from biorepository requests spanning institutions located in Australia, Canada, the UK and the US. We have also compiled data from different vendors and a variety of extraction kits. Our goal is to investigate the lack of standardization that exists between the blood collection and storage protocols at different institutions, the assays they intend to use, and the potential of compromising the health from willing research participants and donors. We would like to have a discussion on the current data we have gathered with others in the biorepository field to see what their experiences are and if there is interest for more collaboration and contribution to this investigation.

## BIOSAMPLES OPEN GOVERNANCE USING BLOCKCHAIN

***Facilitator: Daniel Uribe,*** *Genebank.io*

How Blockchain can enable donors to keep track of their biospecimens and corresponding data sets while participating in a biobank. How can donors be contacted or re-consented with privacy?

## SAMPLE RECONCILIATION – CHALLENGES AND SOLUTIONS

***Facilitator: Cathy Seiler,*** *Kaleido Biosciences*

When receiving samples from clinical trials, external researchers, or other sources, a process of sample reconciliation must take place. This includes ensuring that all the samples that you were supposed to receive were received (and you didn't get any extra!), that you've received the associated sample metadata, and that this data can be associated with the samples that have been received. Though facilitated by sample tracking systems, the process of sample reconciliation can be a detailed and often tedious process. In the context of a clinical trial, it can also involve many external partners such as central laboratories, data management, clinical operations and CROs. This roundtable will discuss challenges that people have faced in reconciling samples and data and the solutions that have worked to make it an easier and more streamlined process.

## LIVING BIOBANK SPECIAL INTEREST GROUP – GOALS AND DIRECTIONS

***Facilitator: Jedidiah Lewis,*** *Organ Preservation Alliance*

ISBER recently announced the launch of the new "Living Biobanking" special interest group. In this roundtable discussion, members of the ISBER community will discuss goals for the group and brainstorm future directions.

# Symposium Presentation Summaries

## SYMPOSIUM 1: BRINGING IT BACK… TO THE COMMUNITY: BANKING ON DIVERSITY & SHARING/ ALL OF US SPOTLIGHT

*Great Northern*

Monday, November 4 | 8:00am – 9:45am

### KEYNOTE LECTURE –INCREASING PRECISION IN MEDICINE: ACCESSING THE MOST GENETICALLY DIVERSE CONTINENT

***Abasi Ene-Obong,*** *PhD, 54gene*

There are ongoing efforts to improve the human genome project to make it more representative of the world population as well as to make it as diverse as possible. Improvement in its diversity will ensure that genomic data is available for the use of people everywhere in the world. The importance of genomic data is immense, as it helps to predict disease occurrence as well as to guide the design of drugs for targeted therapy.

Unfortunately, Africa remains under-represented in the human genome project, due to the unavailability of African-centric genetic studies. This places Africans and all those of African descent at a disadvantage when it comes to access to personalized medicine. 54gene is a robust repository of biological specimens that will generate data to drive bespoke solutions to healthcare and patient management. In doing this, we are giving back to the communities that have contributed to the biobank, so everyone is a beneficiary of the initiative.

### THE NETWORKED APPROACH TO BIOREPOSITORY SCIENCE: BIG OPPORTUNITIES AND BIG CHALLENGES

***Aaron Goldenberg,*** *PhD, MPH,* *Case Western Reserve University;*
***Kyle Brothers,*** *MD, PhD, University of Louisville*

The science of biobanking is being transformed by innovative new approaches to networked science. Networked biorepositories, which link data and biosamples across multiple sites, are often built with the intention of increasing the diversity of samples available for research as well as conducting studies with larger overall sample sizes. They also raise a number of novel challenges related to ethical, legal, and social issues (ELSI). In this presentation, Drs. Aaron Goldenberg and Kyle Brothers will discuss emerging ELSI that are raised by networked biorepositories, with a particular focus on different approaches taken by centralized biorepository networks and decentralized biorepository networks. The All of Us Research Program, the largest research effort ever undertaken by the NIH, will be discussed as a case study to demonstrate these points, with a particular focus on the way its centralized strategy has affected its missions to include diverse communities in research and to engage with underrepresented communities in its development and oversite.

### EVERY SPECIMEN HAS A STORY: ENGAGING WITH BIOBANKING COMMUNITY ADVISORY BOARDS

***Karen Meagher,*** *PhD, Mayo Clinic;* ***David Kotsonas,*** *Community Advisory Board;* ***Betty Smith,*** *Community Advisory Board*

We will describe the evolution of the Mayo Clinic Community Advisory Board (CAB) Network over the last twelve years. A bioethics researcher from the Biomedical Ethics Research Program will describe the different forms of community engagement. The merits and limitations of CABs will be described in relationship to other forms of community engagement including deliberative democracy, focus groups with biobank donors, and community based participatory research (CBPR). As a case study, the biomedical ethics researcher will walk through the return of pharmacogenomics results to biobank participants, including how the Rochester, Minnesota CAB worked with genetics and bioethics researchers to inform how results would be communicated to biobank participants. As ISBER is in Minnesota this year, a CAB member will come from our Rochester, Minnesota area site and describe what it is like to provide advice to the Mayo Clinic Bioethics Research Program, biobank researchers, and biobank leadership. In addition, the CAB member and bioethics researcher will reflect on the network annual biorepository retreat which occurs every fall and includes biobank leaders, bioethicists, and community members.

## SYMPOSIUM 2: ALL ALONG THE WATCH TOWER: WEARABLE DATA TRACKING AND DIRECT TO CONSUMER GENETICS DATA

*Great Northern*

Monday, November 4 |10:15am – 11:45am

### WIRELESS HEALTH AND PERFORMANCE MONITORING SYSTEMS

***Azar Alizadeh,*** *PhD, GE Research*

### DIGITIZING THE PATIENT: OBJECTIVE DATA THAT COMPLEMENTS BIOBANKS

***Jorge Nieva,*** *MD, USC/Norris Cancer Center*

Genomic information on cancer is interesting. When it is tied to clinical outcome data, it is useful. But clinical outcomes are not purely driven by tumor characteristics, they are also driven by characteristics of the patient and the interaction of the patient and the tumor at the reference time that the tumor specimen was taken. A tumor sampled at the end of life and the same tumor sampled in stage 1 may have identical gene profiles, but the clinical outcome data will look very different to the person performing the survival analysis. This presentation will discuss new digital tools that can quantify health of the patient, making it possible for clinicians, biobanks, and drug developers to control for patient factors when analyzing outcome data. Both smartphone -based and in-clinic assessment tools will be discussed.

### DIRECT-TO-CONSUMER GENETIC TESTING: PROMISE, PITFALLS & PERILS

***Ellen Matloff,*** *MS, CGC, My Gene Counsel, LLC*

It is estimated that 100 million people will have undergone direct-to-consumer (DTC) genetic testing by the year 2021. Many companies now offer these services, each with variable qualities, amounts, and types of data. How will that genetic data

be used – by consumers, companies, government, health care providers, big data aggregators, and pharma? The promise of genetic data, as well as the risks, will be discussed.

## SYMPOSIUM 3: DON'T THINK TWICE, IT'S ALRIGHT! THERE ARE MANY ROADS TO SUSTAINABILITY

*Great Northern*

Monday, November 4 | 2:45pm – 4:15pm

### BELL MUSEUM OF NATURAL HISTORY

***Keith Barker,*** *PhD*

The Bell Museum of Natural History is Minnesota's official natural history museum, established by the legislature in 1872 and held in trust by the University of Minnesota. For over a century, the museum has preserved and interpreted Minnesota's rich natural history. The museum's scientific collections contain over one million specimens, representing every county in Minnesota and various locales around the globe.

### BIOREPOSITORY AND LABORATORY SERVICES (BLS), UNIVERSITY OF MINNESOTA

***Cole Drifka,*** *PhD*

The University of Minnesota's Biorepository and Laboratory Services (BLS) program provides centralized biospecimen support to researchers, including tissue procurement, processing, histology, storage, and digital imaging services. Across all functions, BLS currently supports on average 80 unique projects each month within and outside of the University of Minnesota.

### ADVANCED RESEARCH AND DIAGNOSTICS LABORATORY, UNIVERSITY OF MINNESOTA

***Bharat Thyagarajan,*** *MBBS, PhD, MPH*

The Advanced Research and Diagnostic Laboratory (ARDL) is a central biochemistry laboratory primarily serving large federally funded multi-center studies and industry clients outside of the University of Minnesota.

We provide the latest technology and clinical laboratory testing services to researchers and other customers via a 16,000-square-foot customized facility. Constructed in 2013, the ARDL facility is recognized worldwide as a front-runner in innovative design and operational excellence.

Our services include:

a) Coordinating biospecimen collection and processing, specimen testing and analysis, specimen storage, and quality control and quality assurance for large multi-center studies and clinical trials
b) High-volume Immunoassay Testing Platforms
c) Mass Spectrometer Center that performs sample analysis, quantitative proteomics, assay development and assay validation
d) Biorepository services that provide long-term sample storage, cell cryopreservation, DNA sample storage and power back-up protection

### MAYO CLINIC BIOSERVICES

***Mine Çiçek,*** *PhD*

Mayo Clinic seeks to advance research and to improve health for all people, in collaboration with scientists in both industry and academia. Part of what makes Mayo Clinic Bioservices unique is its highly trained, specialized staff. Staff members are researchers themselves; they've been "in the trenches," so they're able to meet with bioservices clients in the design phase. Mayo Clinic Bioservices is dedicated to supporting cutting-edge biomedical research with state-of-the-art biospecimen processing, storage and shipping services. Laboratory services are highly automated; this focus on technology ensures predictable, uniform processes, resulting in high quality outcomes. Mayo Clinic has made a significant, long-term and ongoing investment in the Community Advisory Board for continued guidance of the bioservices program. Researchers and collaborators can pursue their scientific goals confident in the ethics of Mayo's approach.

## SYMPOSIUM 4A: TANGLED UP IN TRYPAN BLUE: LIVING BIOBANKS

*Great Northern*

Monday, November 4 | 4:45pm – 6:30pm

### PDX MOUSE MODELS INTEGRATED INTO A PRECISION MEDICINE INITIATIVE FOR OVARIAN CANCER

***Tim Starr,*** *PhD, University of Minnesota*

We have established an ovarian cancer precision medicine initiative at the University of Minnesota. Our goal is to integrate genomic, clinical and functional data from patient samples to improve therapeutic options. Part of this initiative includes establishment of PDX mouse models for testing chemotherapy resistance. This presentation will describe our efforts to use PDX models in this initiative, including descriptions of the challenges this approach entails.

### GENOME RESOURCE BANKING OF GENETICALLY MODIFIED RODENTS AND CURRENT CHALLENGES

***Yuksel Agca,*** *DVM, PhD, University of Missouri*

There have been profound advances in the development of assisted reproductive technologies (ARTs; superovulation, in-vitro fertilization, micro-insemination, in-vitro embryo culture and transfer) during the past several decades. These ARTs in combination with novel genome editing methodologies (e.g. CRISPR / Cas9) have allowed creation of so many genetically modified (GM) animal models including mouse, rat, pig, non-human primates, drosophila and zebrafish to study genetics origins of human diseases and disorders. These animal models have made substantial contributions for the progression of biomedicine and human health. To this end, genome resource banking (GRB) is the systematic collection, cryo-storage, and re-distribution of cryopreserved germplasm (sperm, oocytes, and embryos) as well as embryonic and induced pluripotent stem cells from GM organisms in an organized, logistical, and secure manner. Currently, there is still an enormous need for efficient germplasm biotechnologies, novel cryopreservation protocols,

sensitive and reliable methods to screen cryopreserved germplasm. This would collectively ensure distribution high-quality, pathogen-free germplasm from these unique models of human diseases. In this presentation, emphasis will be given to current challenges regarding germplasm cryobanking of GM laboratory mouse and rats.

### DEVELOPING AN OFF-THE-SHELF LIVING TISSUE SUPPLY

***Jedediah Lewis,*** *JD, Organ Preservation Alliance*

Recent advances in cryopreservation have created the prospect of providing a wide variety of living tissues off-the-shelf in the near future. ISBER has established a "Living Biobank" special interest group to explore applications for banking tumors, neural tissue, organ slices, and other biosamples for functional studies. This talk will provide context for this new area, tracing the arc of cryopreservation developments in related fields such as organ transplantation, tissue grafting, oncofertility, and tissue biomanufacturing and discussing how these advances could be applied to advance biobanking.

### CRYOPRESERVATION OF CELLS AND SPORES BY ENCAPSULATION

***Alptekin Aksan,*** *PhD, University of Minnesota*

Cryopreservation of cells and spores requires cryoprotectant agents to be present extra-/intracellularly. Most cell membrane permeable cryoprotectant agents are cytotoxic (and even mutagenic), especially at room temperature. This creates significant challenges. The main mechanisms of damage the cryoprotectant agents protect biologicals against are associated with the kinetic and thermodynamic transitions of the extra-/intracellular aqueous milieu. In this presentation; we first describe the different mechanisms of damage induced during freeze/thaw and at cryogenic temperatures, and then introduce different methods (such as encapsulation in hydrogels) and processing practices that could be applied in order to minimize, and potentially eliminate, cytotoxic cryoprotectant use.

## SYMPOSIUM 4B: "ALL I REALLY WANT TO DO"… IS SHARE DATA WITH YOU: REGULATIONS FOR DATA SHARING AND INTERNATIONAL COLLABORATIONS

*Zephyr*

Monday, November 4 | 4:45pm – 6:30pm

### "I AIN'T LOOKIN' TO BLOCK YOU UP": INTERNATIONAL COLLABORATION AND DATA FLOW UNDER THE EU GDPR

***Heidi Beate Bentzen,*** *LLM, University of Oslo*

The European Union General Data Protection Regulation (EU) 2016/679 (GDPR) seeks to harmonize data protection law in the EU. It clarifies the distinction between human biological samples and genetic data. Genetic data is explicitly considered a special category of personal data in the GDPR, subject to strict protection. However, not only protection, but also free movement of personal data within the EU is an objective of the GDPR.

The key information on international collaboration and data sharing within and outside of the EU based on the GDPR will be presented. The EU does not consider countries such as the United States to offer an adequate level of data protection, thus the transatlantic data sharing possibilities are more limited than within the EU. Furthermore, the territorial scope of the GDPR is wide. It will in several instances apply to the processing of personal data of data subjects who are in the EU also where a controller or processor is outside the EU. Some keys to success to collaborate internationally when working with partners across sectors will be suggested.

### IMPACT OF US PRIVACY LAW AND GDPR ON DATA SHARING FOR RESEARCH PURPOSES

***David Peloquin,*** *JD, Ropes & Gray LLP*

This presentation will provide an overview of the challenges posed to research data sharing activities by privacy laws. Topics addressed will include HIPAA, US state law, and the European Union's General Data Protection Regulation. The speaker will address current areas of regulatory uncertainty and provide a summary of approaches taken to share data for research purposes while complying with privacy laws.

### RAPIDLY EVOLVING CHALLENGES AND OPPORTUNITIES OF ACCESS AND BENEFIT SHARING (ABS) RULES FOR BIODIVERSITY COLLECTIONS AND RESEARCH

***Scott Miller,*** *PhD, Smithsonian Institution*

The Nagoya Protocol on Access and Benefit Sharing (ABS) under the Convention on Biological Diversity, and its varied implementation by individual countries, has created confusion in the biodiversity research and collections community. The presentation will address what ABS includes and how it is implemented at national and international levels; how ABS is being addressed by other international bodies in agriculture, medicine, and other fields, such as the Commission on Genetic Resources in Food and Agriculture; current discussions about ABS and "digital sequence information"; and how biobanks can best respond to ABS and related issues.

## SYMPOSIUM 5: FOREVER YOUNG? BIOSPECIMEN QUALITY TO ENSURE LONGEVITY

*Great Northern*

Tuesday, November 5 | 8:00am – 9:30am

### DEFINING QUALITY IN TISSUE BIOSPECIMENS

***Stephen Hewitt,*** *MD, PhD, National Cancer Institute*

Historically, quality of tissue has been defined by subjective metrics based most commonly on histomorphology. Although histomorphology remains an essential metric of tissue quality, the quality of the individual bioanalytes – protein, RNA and DNA must be defined to ensure that the tissue is fit for purpose. As the preservation of tissue for biomedical research has a long history, closely tied to pathology practice, before the application of molecular biologic techniques, unwinding the preservation systems to define reproducible objective metrics of quality and subsequently dissect the process of preservation to determine what factors impact quality has been required. Although the

quality of all the metrics follows together, RNA is clearly the most sensitive metric for tissue quality. A "fit-for-purpose" approach to defining quality metrics and how they support research into tissue quality will be described.

### WHAT IS THE ROLE OF PRE-ANALYTICAL VARIABLES ON THROMBOSIS BIOMARKERS IN A DIVERSE POPULATION OF CANCER PATIENTS?

***Elizabeth Duffy,*** *MA, Boston Medical Center*

In a two and a half year study with 262 subjects, we aimed to examine the effect of three pre-analytic variables (PAVs) frequently encountered in hospital or research laboratories on thrombosis biomarkers in a racially diverse cancer population. Cancer is known to increase the risk of thromboembolism, but few biomarkers have been evaluated for PAVs in a cancer population. We focused our investigation to newly diagnosed, treatment naïve adult patients that were controlled for age, race and sex. All elements of the study were controlled by rigorous standard operating procedures (SOPs); including blood draw, blood processing, labeling, storage, testing, and analysis. PAVs studied were delay to processing, delay to testing and freeze-thaw cycles. This project underscores the importance of considering pre-analytic variables in blood processing, sample testing, storage, and assay quality control procedures during measurement of thrombosis and inflammation biomarkers.

### DELTA-S-CYS-ALBUMIN: A LAB TEST THAT QUANTIFIES CUMULATIVE EXPOSURE OF ARCHIVED HUMAN BLOOD PLASMA AND SERUM SAMPLES TO THAWED CONDITIONS

***Chad Borges,*** *PhD, Arizona State University*

Exposure of blood plasma/serum (P/S) to thawed conditions (> -30 °C) can produce biomolecular changes that skew measurements of biomarkers within archived patient samples, potentially rendering them unfit for molecular analysis. Since freeze-thaw histories are often poorly documented, objective methods for assessing molecular fitness prior to analysis are needed. This presentation will describe the development of a 10-µL, dilute-and-shoot, intact-protein mass spectrometric assay of albumin proteoforms called "ΔS-Cys-Albumin" that serves as an endogenous marker of P/S exposure to thawed conditions based on the inexorable ex vivo S-cysteinylation (oxidizability) of albumin. In summary, average values of ΔS-Cys-Albumin in matched, fresh P/S samples from a population of non-acute cardiac patients were determined. The multi-reaction mechanism that drives changes in albumin S-cysteinylation is known and the rate law for it was established and accurately modeled in P/S—enabling back-calculation of the time at which unknown P/S specimens have been exposed to the equivalent of room temperature. Blind challenges and an unanticipated case study of samples collected under NIH sponsorship and intended for distribution by NIH ultimately demonstrated the functional utility of the ΔS-Cys-Albumin assay.

## SYMPOSIUM 6A: SHELTER FROM THE STORM: KEEPING BIOSPECIMENS ALIVE

*Great Northern*

Tuesday, November 5 | 1:30pm – 3:15pm

### THE RAMS REGISTRY/REPOSITORY: BIOBANKING FOR MICROBIOME RESEARCH IN WOMEN'S REPRODUCTIVE HEALTH AND PREGNANCY

***Gregory Buck,*** *PhD, Virginia Commonwealth University*

The vaginal microbiome has an impact on women's reproductive health and pregnancy. The view that the healthy vaginal microbiome is associated with a microbiota dominated by species of Lactobacillus has recently been challenged by studies of different demographic and racial populations. These studies are dependent on biobanks prospectively collecting, processing and storing samples for analysis using high throughput genomic, transcriptomics, metabolomic, proteomic and other omic platforms. Our work, supported by grants from the NIH Human Microbiome Project, the NIH Eunice Kennedy Shriver National Institute of Child Health and Human Development, and the Global Alliance to Prevent Prematurity and Stillbirth, required establishment of the Research Alliance for Microbiome Science (RAMS) Registry/Repository. The RAMS Registry includes research coordinators, sample processing technicians, freezers for sample storage, and an integrated digital sample management system. The Registry maintains over 250,000 samples (swabs, blood, urine, birth products, meconium and stool, etc.) from several independently funded research projects. Analysis of these samples has led to novel findings concerning the impact of the vaginal and related microbiomes on women's reproductive health and pregnancy.

### BIOBANKS IN LMIC: GLOBAL EFFORTS NEEDED TO FOSTER PEDIATRIC CANCER RESEARCH

***Rania Labib,*** *PhD, Children's Cancer Hospital-57357-Egypt*

Finding a cure for childhood cancers is a huge mission, especially in a limited resource country where research in this field is a challenge. There is not enough data available regarding how much LMICs contribute to research. There is great role of disparities in cancer etiology, treatment and response. Unavailability of quality specimens from these regions of the world has hindered inclusion of this specific racial/ethnic group in international population studies and other biomedical studies. This has led to their under-representation in different genomic projects such as HapMap, with the result that there is no available genomic data to detect biological differences and provide different treatment responses in this population.

There is a need for global efforts to increase in biomedical research aimed at developing personalized medicine. This in turn, will require a supply of high quality clinically annotated biospecimens fit-for-all research. Hence, having biorepositories established in different regions to standardize procedures supported by evidence-based science for all sample procurement, processing, storage, and distribution processes is a basic requirement.

### CONDITIONALLY REPROGRAMMED NORMAL AND TUMOR CELLS – A LIVING BIOBANK – FOR PRECISION MEDICINE

***Xuefeng Liu,*** *MD, Lombardi Comprehensive Cancer Center, Georgetown University*

We describe a general method, Conditional Reprogramming (CR), that rapidly expands both normal and malignant epithelial cells from diverse anatomic sites and mammalian species and does not require transfection with exogenous viral or cellular genes. Establishment of cell cultures from both normal and tumor tissue is highly efficient. Perhaps most important, cell cultures can be generated readily from core biopsies as well as cryopreserved human specimens. Normal breast and prostate cultures retain a normal karyotype and differentiation potential and cell lines derived from tumors retain their tumorigenic phenotype. We will describe several approaches that allow to enrich cancer cells from urine (for bladder cancer), blood (for prostate cancer),and pleural effusion (for non-small cell lung carcinoma). We also reported that these cancer cells from liquid biopsies were used to identify therapies for the patients. The ability to produce inexhaustible cell populations from small biopsies and cryopreserved specimens has the potential to transform biobanking repositories and current pathology practice by enabling genetic, biochemical, metabolomic, proteomic, and biological assays, including chemosensitivity testing as a functional diagnostics tool for precision cancer medicine.

## SYMPOSIUM 6B: INTEGRATING DIGITAL BIOSPECIMENS: DON'T LEAVE THEM "BLOWIN' IN THE WIND"

*Zephyr*

Tuesday, November 5 | 1:30pm – 3:15pm

### ADVANCING DIGITAL BIOBANKING: IMPACT OF DIGITAL PATHOLOGY AND COMPUTATIONAL PATHOLOGY TOOLS

***Anil Parwani,*** *MD, PhD, MBA, The Ohio State University*

Automated whole slide imaging (WSI) scanners are now rendering diagnostic quality, high-resolution images of entire glass slides and combining these images with innovative digital pathology and artificial intelligence tools that are making it possible to integrate imaging into all aspects of pathology workflow including anatomical, clinical and molecular pathology. This is an especially exciting time in biobanking as these exciting tools and technology are rapidly becoming an integral component of the pathology practice, and will provide opportunities for innovations and advances in biobanking. This lecture will provide an overview of digital pathology and AI tools currently being used in the pathology workflow and to provide practical insights into the use of these technologies into transforming the workflow of a modern biobank. A framework of knowledge will be provided by an extended and interactive Q&A session which will serve to demystify the use of WSI and image analysis tools for biobanking applications, implementation challenges and pearls.

### DIGITAL PATHOLOGY AND AI – FUTURE OPPORTUNITIES

***Michael Feldman,*** *MD, PhD, University of Pennsylvania Healthcare System*

This presentation will focus on digital pathology and ML/AI tools that enable diagnostics and research. It will review elements of both as well as provide a vision of the future and how new workflows may be enabled in the digital pathology workspace. Future imaging technologies will also be introduced.

### DIAGNOSTIC CONSENSUS THROUGH IMAGE SEARCH – LESSONS LEARNED FROM SEARCHING IN TCGA REPOSITORY OF WHOLE SLIDE IMAGES

***Hamid Tizhoosh,*** *PhD, Kimia Lab, University of Waterloo*

Can we build diagnostic consensus using large repositories of histopathology images? The emergence of digital pathology has opened new horizons for histopathology and other related fields such as histology and cytology. Computer programs, most notably artificial-intelligence algorithms, can now operate on biopsy samples and assist pathologists during the diagnostic process. Whereas classification and segmentation methods have obvious benefits for some stages of this process, image search and retrieval may be a fundamental shift in diagnostic pathology by providing access to evidently diagnosed cases in existing repositories. This would offer ``virtual peer review'' to increase the accuracy and help to decrease the waiting time for diagnosis through computational consensus building. In this talk, some results for searching in the largest public repository (TCGA program) of digitized biopsy samples of almost 11,000 patients depicting different types of malignancies will be reported. Based on the anlaysis of findings, image search appears to be a reliable platform to exploit the archived (and so far unused) knowledge in digital repositories of histopathology images.

### ESTABLISHING A SEARCHABLE IMAGING DATA COMMONS: MINING DIGITAL PATHOLOGY AND TUMOR IMAGING

***David Gutman,*** *MD, PhD, Emory University*

Our team built the Cancer Digital Slide Archive, a web-based resource housing all 25,000+ digital pathology slides from the TCGA. Since then, we have developed the Digital Slide Archive (DSA), a flexible open-source slide management platform. We will highlight some of our ongoing work developing the DSA platform, including image analysis, visualization of machine-derived and human generated annotations, and analysis workflows.

The DSA is also being used to visualize data from the Human Tumor Atlas Network (HTAN), which is one of the NCI Moonshot projects. We will highlight some of our latest work demonstrating the visualization and analysis of new multiSpectral imaging technologies such as CODEX and cyCIF.

# Educational Workshop Summaries

## PRE-CONFERENCE WORKSHOP: BIOBANKING 101

*Zephyr*

Sunday, November 3 | 1:00pm – 5:00pm

**Pre-registration required. Registration fee of $95.*

### ISBER TOOLS – INTERNATIONAL REPOSITORY LOCATOR

***Joanne Demchok,*** *National Cancer Institute*

The availability of a searchable (online) repository locator, is crucial to research infrastructure. To maximize the value of a specimen or collection, a researcher must be able to locate it. In addition, to generate data that contains statistical rigor, researchers may need to locate and access specimens from multiple repositories. An international repository locator (IRL), containing multiple repositories, would increase accessibility of repositories among key stakeholders including ISBER members, researchers, funding bodies, governments, and private industry.

The Working Group currently includes ISBER members from nine countries: Australia, France, Germany, Italy, the Netherlands, Qatar, Switzerland, the UK and the USA, with collective expertise in informatics, repository management, database management, and online locators.

### HOW TO WRITE AN INFORMED CONSENT DOCUMENT

***Helena Ellis,*** *Biobanking Without Borders*

All too often consent forms are written in language that is difficult to understand, with lots of legalese to fulfill regulatory requirements but without significant attention as to whether or not the form actually imparts key information to participants in an understandable manner. In the US the average person reads at the 7th or 8th grade level, so how can we make documents and the risks of genetic tests understandable? It takes an interest and time to review and revise the typical consent form, but the payoffs are substantial. There are many published guides and tools to help researchers write a comprehensible, reasonable length consent form, with simple words and conversational language. This workshop will provide easy to implement, step by step instructions to write clear biobanking consent forms based on published health literacy principles.

### COLD CHAIN MANAGEMENT

***Kathi Shea,*** *Brooks Life Sciences*

Time and temperature are two variables known to impact sample integrity. In this course we will focus on the approaches for managing the cold chain throughout the lifecycle of a sample. Various methods and tools that can be used for selection and qualification of shipping containers, work stations and storage units will be discussed, along with approaches that can be used for measuring and monitoring of temperature during sample acquisition, processing, handling, storage and distribution.

## WORKSHOP 1: CONSENT FOR FUTURE USE OF BIOSPECIMENS UNDER THE REVISED COMMON RULE

*Zephyr*

Tuesday, November 5 | 8:00am – 9:30pm

***Presenters: Marianna Bledsoe,*** *Independent Consultant;* ***William Grizzle,*** *University of Alabama at Birmingham;* ***David Peloquin,*** *Ropes & Gray LLP*

In January of 2017, the US federal government issued the first major revision to the Federal Policy for the Protection of Human Subjects in Research (the Common Rule) to address changes in the ethical and scientific landscape since the policy was first published in 1991. The revised Common Rule includes changes that significantly affect biobanking. The general compliance date for most of the Common Rule's provisions was January 21, 2019.

Among the most significant changes related to biobanking in the revised Common Rule is a new provision for broad consent for the storage, maintenance, and research use of identifiable information and biospecimens for future research [45 CFR 46.116(d)]. This broad consent allows participants to consent to future research on their biospecimens and associated data using a consent form that differs from the standard informed consent. The use of the broad consent allows secondary research using the biospecimens to meet an exemption that relies on a limited IRB review if certain conditions are met.

The new broad consent provision has a significant limitation. If a participant refuses to provide broad consent, an IRB can never subsequently waive informed consent for the use of the participant's biospecimens and associated data. This restriction requires significant tracking capability within an institution and, in some cases, even across institutions.

In this workshop, presenters and attendees will discuss the interpretation of this provision of the revised Common Rule, various strategies for implementing informed consent for future use of biospecimens under the revised Common Rule, and potential alternatives that exist under the revised Common Rule. Case examples will be used to illustrate various approaches that may be used under the Rule.

The format for the workshop will include several short introductory presentations, followed by an extensive, interactive discussion in which attendees will share their experiences and successful approaches to implement consent for future research on biospecimens and associated data under the revised Common Rule.

## WORKSHOP 2: IRREPRODUCIBLE RESEARCH BASED ON HUMAN BIOSPECIMENS: CAN NEW MODELS OF BIORESOURCES AMELIORATE THIS PROBLEM?

*Great Northern*

Tuesday, November 5 | 3:45pm – 5:15pm

***Presenters: William Grizzle,*** *University of Alabama at Birmingham;* ***Shannon McCall,*** *Duke University School of Medicine*

Perceived irreproducibility in research results using human tissue may be due to experimental design, exclusion of data, analytical approaches and statistics or may be secondary to bias associated with biospecimens including preanalytical variability, bioresource operations and biospecimens that are suboptimal. This workshop focuses on tissue variables that may impact research with human biospecimens. Problems can be exacerbated when new models such as reproducible biospecimens are developed or added to an existing bioresource. Irreproducibility increases if investigators and bioresource personnel are not adequately educated as to its causes. Personnel should be trained in new bioresource models before their adoption, e.g., living biobank.

Specific areas that will be addressed are the following:

- Pre-analytical variables that affect the usefulness of human tissues in research include: donor variables, changes secondary to initial diagnosis, warm and cold ischemia, tissue damage during surgery, limitations and errors imposed by collection, processing, storage and/or distribution of biospecimens, and variables of renewable biospecimens and their optimal use
- Quality assurance including quality control
- Sources of bias associated with the use of biospecimens in research including patient-derived renewable biospecimens
- Biospecimen features necessary to support research based on specific technologies and preparations that may require macro/microdissection
- Storage parameters and distribution approaches affecting biospecimens including renewable biospecimens
- Tissue utilization of biospecimens including renewable biospecimens
- Challenges in meeting future research needs

Drs. McCall and Grizzle are experienced diagnostic and research pathologists with knowledge of bioresources, translational research, biorepository sciences and bioresource modifications needed for renewable biospecimens. A ten-minute discussion period will allow questions from participants and sharing of ideas.

## WORKSHOP 3: IF IT'S FITNESS-FOR-PURPOSE YOU'RE CHASIN'… THE TOOLS, THEY ARE A CHANGIN': LEVERAGING STANDARDS, ISBER TOOLS AND OTHER RESOURCES

*Southern Pacific*

Tuesday, November 5 | 3:45pm – 5:15pm

***Presenters: Clare Allocca,*** *National Institute of Standards & Technology;* ***Marianna Bledsoe,*** *Independent Consultant;* ***Koh Furuta,*** *Council for Industrial Use of Biological and Environmental Repositories (CIBER)*

Biobanking standards and best practices are critical for ensuring that biospecimens are fit for purpose and that the results of studies using biospecimens from biobanks are meaningful and reproducible. Multiple standards and tools are available or under development, with a general goal of maximizing fitness-for-purpose of biological materials and associated data (BMAD). Included among these tools are standards falling under the umbrella of ISO 20387 general requirements for biobanks. ISBER also offers a number of tools, the most broad-ranging of which is the ISBER Best Practices (4th Edition + Addendum). Additionally, there are several other resources (e.g., CAP, CTRNet) available to facilitate other approaches to fitness-for-purpose in biobanks. How can biobanks use these best practices, tools and standards together to meet their individual goals and achieve fitness-for-purpose for their biobank?

In this workshop, a mapping of the ISBER Best Practices 4th Edition against ISO 20387 will be presented. The differing goals of these and other tools will be examined, and paths of simultaneous implementation discussed in the context of multiple biobank scenarios/goals. Presenters will discuss how these tools can be used to meet specific requirements of ISO 20387 as well as the general pursuit of fitness-for-purpose. Among the tools to be introduced are the ISBER Self-Assessment Tool (SAT) and ISBER Self Auditing Tool.

A panel will discuss the application of this integrated map, with several case studies to demonstrate the considerations that come into play, and examine potential outcomes. The panel discussion will be followed by an audience question and answer session and interactive dialogue on the stand-alone and complementary application of standards, best practices, and other resources, including those apart from ISBER (e.g., CAP and CTRNet) to achieve fitness-for-purpose through quality biobanking processes and products.

A significant number of biobanks may find that their pursuit of ISBER tools and other instruments will have taken them a significant distance towards implementation of the ISO 20387 standard. This workshop will build upon concepts described during previous ISBER workshops and will serve to help participants understand how biobanking standards, taken together with the broad spectrum of tools now available, can help to improve quality in biobanking.

## WORKSHOP 4: PITCHING BIOBANKING

*Zephyr*

Tuesday, November 5 | 3:45pm – 5:15pm

***Presenters: Suzanne Vercauteren,*** *BC Children's Hospital Biobank;* ***Daniel Catchpoole,*** *The Tumour Bank – CCRU*

Over the last decade recognition of the practice of biobanking has dramatically increased and in many academic centres biobanking has become routine. However, stakeholder engagement for biobanks is often limited and challenging. Many stakeholders in the biobanking process including patients, the general public, hospital administration, industry but also researchers and clinicians have no or little concept about the role and function of biobanks to advance research. This results in underuse and underfunding of biobanks. There is an obvious need to engage and educate stakeholders to increase the operational and financial viability of biobanks. However, many biobanks struggle with how and when to present the importance of biobanking to key players. An elevator pitch is a brief, persuasive speech that can be used to spark interest in a topic such as biobanking. We propose to develop elevator pitches for stakeholders in biobanking so that all biobankers have tools to persuade key stakeholders. Key stakeholders for which elevator pitches will be created include the public, patients, researchers, clinicians and nurses, administration of hospital or academic institution, industry, advocacy groups.

The objective of the workshop is to have attendees develop elevator pitches for a target audience to raise awareness and use of biobanks. This elevator pitch should contain key messages for the specific target group and should be no longer than 30 seconds.

Attendees of this workshop will be divided into working groups. Following a brief introduction to the purpose of the session, the groups will be given a target audience for which to develop a 30 second elevator pitch. The elevator pitch should describe key messages for the specific target group. Each working group will present their elevator pitch to the whole group with a discussion after each pitch.

All members will receive a written version of the elevator pitches presented at the workshop with permission of the presenters.

# Corporate Workshop/Symposium Summaries

## CORPORATE WORKSHOP 1: OPENSPECIMEN - WORLD'S MOST WIDELY USED OPEN SOURCE BIOSPECIMEN MANAGEMENT SOFTWARE

*Southern Pacific*

Monday, November 4 | 12:00pm – 1:00pm

OPENSPECIMEN
a krishagni product

***Presenter: Srikanth Adiga,*** *OpenSpecimen*

Attend this session to learn how OpenSpecimen is used in leading research centers like Johns Hopkins, UPitt, UPenn, UMass, Emory, UC Davis, Washington University, and others to manage different kinds of biospecimen collections: e.g., prospective biobanking, longitudinal (clinical study/trial), animal, etc.

Learning Objectives:

1. Real-world case studies of OpenSpecimen usage in different centers
2. Integration with REDCap, EPIC, etc.
3. Collecting specimen annotations and reporting (i.e., finding specimens of interest)
4. How your center can adopt OpenSpecimen

## CORPORATE WORKSHOP 2: THE IMPORTANCE OF SAMPLE MANAGEMENT IN PRECISION MEDICINE: A HIGH-THROUGHPUT BIOBANKING WORKFLOW SOLUTION

*Zephyr*

Monday, November 4 | 12:00pm – 1:00pm

Brooks LIFE SCIENCES

PerkinElmer For the Better

***Presenters: Andrew Brooks,*** *Chief Operating Officer and Director of Technology Development of RUCDR Infinite Biologics, Chief Scientific Officer Brooks Life Sciences;* ***Mark Dupal,*** *Director of Market Development, PerkinElmer Applied Genomics*

The increased acceptance and implementation of precision medicine, direct to consumer genomics and applications such as regenerative medicine have driven the need and adoption for the storage of primary samples and the isolation and storage of high quality, high molecular weight nucleic acid. One reason for primary sample and nucleic acid storage is the value of the information held within the sample.

The application of sequencing technologies to research and clinical settings has increased dramatically, generating vast amounts of data about variations in our genomes that could explain some differences in disease susceptibility, progression and how patients react to drugs. The move towards precision medicine and immune modulation therapy development, both requiring sequencing in the treatment workflow, drive the demand for faster processing, storage and data sample management techniques.

Efficient and effective storage ensuring sample integrity is of the utmost importance; retention of sample information with the associated phenotypic insight can provide a wealth of genetic and environmental information that can be unlocked in an attempt to better understand disease and health. In this workshop we explore industry collaborations to provide a solution to the increased need for efficient sample management and nucleic acid extraction that meet todays increased requirement for higher throughput full workflow solutions.

Learning Objectives:

1. Why preserving sample integrity through automated cold chain sample management is vital for sample viability and throughput efficiency
2. High throughput nucleic acid extraction workflow technology advancements
3. Quantification and nucleic acid normalization techniques
4. The importance of high quality nucleic acid extraction
5. Example case study workflows of automated sample management and nucleic acid extraction workflows and the importance to future precision medicine treatments

Brooks LIFE SCIENCES

# "ALL ABOUT THE SAMPLE"

## Smarter Sample Solutions to Protect Sample Integrity

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## CORPORATE WORKSHOP 3: ADVANTAGES OF SOP-BASED NMR DIAGNOSTICS FOR THE QUALITY AND FUTURE-PROOFING OF BIOBANK SAMPLES

*Southern Pacific*

Monday, November 4 | 1:30pm – 2:30pm


***Presenter: Eduardo Nascimento,*** *PhD, Field Application Scientist – AIC (Applied, Industrial & Clinical MR Market Division), Bruker BioSpin Corp.*

NMR QC-Biobank Solution is a fully standardized 600 MHz IVDr platform. This includes SOPs for sample preparation and qualification of plasma, serum, urine, CSF and contains extracts of body fluids, cells and tissues. The customer can share this NMR-date around the world. The user benefits from the WISYWYG solution with NMR diagnostics with highest reproducibility and transferability.

## CORPORATE WORKSHOP 4: CAN YOU JUSTIFY AUTOMATING YOUR STORAGE?

*Zephyr*

Monday, November 4 | 1:30pm – 2:30pm


***Presenters: Issa Isaac,*** *Sales Manager – Midwest, TTP Labtech;* ***Paul Lomax,*** *Product Manager, TTP Labtech*

Any investment in automation usually requires a sound business plan to justify the cost of installation and ongoing running costs. This workshop considers the factors determining whether automation is viable for a biobank and will provide attendees with a framework to evaluate current manual workflows against automated solutions on a cost per sample basis. This will help to determine whether automation is viable based on the use case and help to build a business case to justify it. The workshop will also consider fully and partially automated approaches to storage, demonstrating that automation can be relevant in a range of settings and not just the largest biobanks.

Learning objectives:

1. Fully appreciate the real costs of manual storage practices
2. Identify the key factors in considering the benefits of automation in any organisation large or small
3. Be able to fully quantify the cost per sample of automated storage vs manual
4. Consider the potential wider benefits of automation vs manual storage
5. Consider other factors such as environmental policies
6. Plan flexible short and long term strategies

## CORPORATE LUNCH SYMPOSIUM: IS YOUR CELL-FREE DNA SAMPLE FIT FOR PURPOSE? BIOBANK SAMPLES QC FROM AGILENT

*Great Northern*

Tuesday, November 5 | 11:45am – 1:15pm


### AGILENT'S NEW AUTOMATED ELECTROPHORESIS SOLUTIONS

***Elisa Viering,*** *Agilent Technologies*

### CELL-FREE DNA QUALITY AND QUANTITY ASSESSMENT – A METHOD COMPARISON

***Thorsten Voss,*** *PreAnalytiX GmbH*

### AUTOMATED LOW INPUT PULSED-FIELD ANALYSIS OF GENOMIC DNA

***Kyle Luttgeharm,*** *Agilent Technologies*

Join us for a corporate partner workshop about biobank sample quality control (QC). The DNA and RNA samples that you store in your biobank will be used for critical research later. Our workshop will show you how to improve confidence in your QC analysis—before and after samples go into storage using different automated electrophoresis platforms.

You'll learn how to:

1. Streamline your QC workflow with the new cell-free DNA assay
2. Make informed decisions with reliable qualification of cell-free DNA
3. Use less of your precious sample for your QC and accurately size high molecular weight gDNA

# Poster Sessions

| FINAL ID | TITLE | PRESENTER | PRESENTER INSTITUTION |
|---|---|---|---|
| PA-01 | The National Center Biobank Network (NCBN) in Japan | Reiko Miyahara | *National Center for Global Health and Medicine, Japan* |
| PA-02 | The Total Cancer Care (TCC) Biobank at the Moffitt Cancer Center: Report of 13-years of Experience | Erin M. Siegel | *H. Lee Moffitt Cancer Center & Research Institute, United States* |
| PA-03 | Role of Biorepository in Prospective Sample Collection for Biomarker Discovery | Sangita Paul | *University Health Network, Canada* |
| PA-04L | The Gundersen Cancer Biobank, a Multi-Decade Resource for Cancer Research | Craig Richmond | *Gundersen Health System, United States* |
| PA-05L | Establishment of a Biorepository and Logistics Hub for the Kidney Precision Medicine Project | Victoria M. Blanc | *University of Michigan Medical School, United States* |
| PB-01 | The National Marine Mammal Tissue Bank | Amanda Moors | *National Institute of Standards and Technology, United States* |
| PC-01 | Determining Quality of Biobanked Tissue Specimens | Paige Muir | *UBC Department of Pathology, Canada* |
| PC-02 | Formalin Fixation in the Clinical Setting: To What Extent do Delays to Processing of Formalin-Fixed, Paraffin-Embedded Clinical Biospecimens Impact Nucleic Acid Quality? | William Mathieson | *Integrated Biobank of Luxembourg, Luxembourg* |
| PC-03 | Design, Implementation and Results of a Quality Control Initiative for Archived DNA Biospecimens | James Juan | *Intermountain Healthcare, United States* |
| PC-04 | Obtaining High Quality Nucleic Acids from FTA Cards for the Creation of Biological Sample Collection Stored at Room Temperature | Alvaro Jimenez | *Instituto de Investigación Biomédica de Málaga-IBIMA, Spain* |
| PC-05 | High Quality DNA from Blood Clots for the Creation of Strategic Collections of High Interest in Biobanking | Virginia Chamorro | *Instituto de Investigación Biomédica de Málaga-IBIMA, Spain* |
| PC-06 | What Protocol is Best for Obtaining High Quality DNA from Buffy Coat? | Jesús Ortega-Pinazo | *Instituto de Investigación Biomédica de Málaga-IBIMA, Spain* |
| PC-07 | Researcher Requested Fresh Human Tissue Samples, 2015 - 2018: Increase in Custom Fresh Sample Preparation Types | Randal L. Mandt | *The Ohio State University (OSU), United States* |
| PC-08 | Prolonged Ischemia Time on Tissue Quality: Effect on RNA Isolated from Kidney, Lung, Breast, and Heart Tissue | Stella Somiari | *Windber Research Institute, United States* |
| PC-09 | Plasma Lactate as a Quality Indicator for Stored Specimens | Shyanne Zubal | *Intermountain Healthcare, United States* |
| PC-10L | Testing the Quality and Stability of Plasma Protein and Whole Blood RNA in Archived Loggerhead Sea Turtle Blood, Caretta caretta | Jennifer Ness | *National Institute of Standards and Technology, United States* |
| PD-01 | Development of an Access Portal to Coordinate Biobanking Research | Alan E. Bauck | *Kaiser Permanente Northwest, United States* |
| PD-02 | Bringing Biobanking to the Community: Helping to Close the Gap in Cancer Disparities | Brittany T. Ivey | *Medical University of South Carolina, United States* |
| PE-01 | Digital Image Biorepository of Malignant, Benign and Normal Tissues with Associated Quality and Clinical Data | Randal L. Mandt | *The Ohio State University (OSU), United States* |
| PE-02 | Method for Fecal Sample Processing for Microbiome Studies and Biobanking | Raul De Jesus Cano | *The BioCollective, LLC, United States* |
| PE-03L | Establishing a Science-Driven Biobank for Cancer Moonshot Research Programs | Ping Guan | *National Cancer Institute, United States* |
| PF-01 | Research Resources for Measurement of Thrombosis Biomarkers in Cancer Patients | Michelle A. Berny-Lang | *National Cancer Institute, United States* |
| PF-02 | Biobank Platforms in Clinical Trials: A Strategic Role for Specific Samples | Beatriz Martínez | *Instituto de Investigación Biomédica de Málaga-IBIMA, Spain* |
| PF-03 | Development of a Biobanking Workflow for the Implementation of Cardiac Troponin, a New Clinical Laboratory Assay | Stephanie Falwell | *UC DAVIS HEALTH, United States* |
| PF-04 | Streamlined Tissue Homogenization for High-Throughput Nucleic Acid Extraction from Pediatric CNS Tumors | Jennifer Cross | *Johns Hopkins All Children's Pediatric Biorepository, United States* |

| FINAL ID | TITLE | PRESENTER | PRESENTER INSTITUTION |
|---|---|---|---|
| PG-01 | Sample Quality Control of Cell-Free DNA | Kyle Luttgeharm | *Agilent Technologies R&D and Marketing GmbH & Co KG, United States* |
| PG-02 | Use of Micro-Electro-Mechanical Systems (MEMS) Technology to Evaluate Specimen Temperature Profiles during Various Biobanking Processes | Joseph Kessler | *Medpace Labs, United States* |
| PG-03 | Microfabrication can Provide Low-cost Customizable Counting Chambers for Standardized Estimation of Sperm Concentration | Yue Liu | *Louisiana State University AgCenter, United States* |
| PG-04 | The Fluidigm® Advanta™ Sample ID Genotyping Panel Enables Sample Quality Control by Detecting Sample Contamination and Accurately Distinguishing Related Samples | Honrado Lopez | *Fluidigm Corporation, United States* |
| PG-05 | A Comparison Between Automated Storage Refrigeration and Manual ULT Technology Identifying Improvements in Temperature Uniformity to Protect Sample Integrity | Chris Wolfenden | *Brooks Life Sciences, United Kingdom* |
| PG-06 | Accurate Modeling of the Institution-wide Impact of ULT Freezer Assets on Energy Use and Electricity Costs | Dean Shehu | *UCSF, United States* |
| PG-07 | Enabling Biobanks to Achieve ISO 20387 Compliance Using a Cloud-based LIMS | Shonali Paul | *CloudLIMS Software Solutions, India* |
| PG-08 | A Worldwide Study of the Factors Affecting Sustainable Biobanking Operations and Technology-based Solutions Enabling Smart and Just-in-Time Biobanking Strategies to Increase Utilization | Emily Hubbard | *iSpecimen, United States* |
| PG-09 | Accreditation by A2LA to ISO 20387:2018 – The New Standard of Excellence for Biobanking | Chris Gunning | *A2LA, United States* |
| PG-10L | BCRQUEST.com Network – Shared Value and Sustainability | Outi Törnwall | *BC Platforms, Switzerland* |
| PG-11L | Biobanking Re-imagined. The Repurposing Of Established Pneumatic Technology For Efficient High Quality Biobanking | Paul Keith Lomax | *TTP Labtech, United Kingdom* |
| PH-01 | Synergy in the Biobank System Production After the Merger of Local Nodes | Tatiana Díaz | *Instituto de Investigación Biomédica de Málaga-IBIMA, Spain* |
| PH-02 | Building an Outward-Facing Biospecimen Resource for Arizona Researchers: The Arizona Biospecimen Consortium (ABC) Creates The Arizona Biospecimen Locator (ABL) | Rosy Singh | *St Joseph's Hospital & Medical Center, Barrow Neurological Institute, United States* |
| PH-03 | Adoption of an Open-Source Biospecimen Information Management System by a High-Throughput, CAP Accredited Biorepository | Dave A. Mulvihill | *Washington University in St. Louis, United States* |
| PH-04L | NIST Biorepository Tools: Freezer Visual Information System (FreezerVIS) | Jared M. Ragland | *National Institute of Standards and Technology, United States* |
| PH-05L | NIST Biorepository Tools: Freezer Check | Jared M. Ragland | *National Institute of Standards and Technology, United States* |
| PH-06L | Use of the Biobanking 3.0 Concept to Analyze the Output of Internal Development Projects Regarding Quantity, Quality and Stakeholder Needs at Biobank Graz | Daniel Simeon-Dubach | *medservice, Switzerland* |
| PH-07L | Development of an Integrated Biobank Data Management Software System for Use by Biobank Staff, as well as for Researchers to Access Required Samples | Sahar Jahangiri | *Create Fertility Centre, Canada* |
| PI-01 | ISBER Best Practices to Support Quality Management System of Biobanks | Daniel Simeon-Dubach | *medservice, Switzerland* |
| PI-02 | Survey Amongst the Downloaders of the ISBER Best Practice 4th Edition | Daniel Simeon-Dubach | *medservice, Switzerland* |
| PI-03 | ISO 20387, ISBER Best Practices, and Other ISBER Tools: Working Together to Ensure Fitness-for-Purpose | Clare M. Allocca | *National Institute of Standards and Technology, United States* |
| PJ-01 | ISBER Tools to Facilitate Quality Biobanking | Debra L. Garcia | *ISBER, United States* |
| O-08 | NASA Institutional Scientific Collection (ISC) at Ames Research Center | Ryan T. Scott | *NASA, Wyle Labs, United States* |

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## Abbott Informatics — Booth 5

Abbott Informatics provides leading Laboratory Information Management Systems (LIMS) solutions that have served customers around the world for more than 30 years. The Abbott Informatics' STARLIMS solutions improve the reliability of laboratory sampling processes, support compliance with global regulatory requirements and industry standards, and provide comprehensive reporting, monitoring and analysis capabilities.

## Agilent Technologies — Booth 25

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Agilent is a leader in life sciences, diagnostics and applied chemical markets. The company provides laboratories worldwide with instruments, services, consumables, applications and expertise, enabling customers to gain the insights they seek. Agilent's expertise and trusted collaboration give them the highest confidence in our solutions.

## Autoscribe Informatics Inc — Booth 30

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Whatever your Biobank Management needs, the Matrix Biobank Management System is easily adapted to suit them. Our simple to use graphical configuration tools set Matrix apart from other Biobank software solutions. Store and retrieve biospecimens while optimizing storage, managing data and tracking test results. Dual desktop and web applications provide maximum flexibility to work in the laboratory, across the internet, even offline. Please visit our booth to discover Matrix Biobank Management System.

## Bahnson Environmental Specialties, LLC. — Booth 16

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Bahnson Environmental Specialties, an Emcor Company, is a leading manufacturer of high volume custom low temperature reach-in and walk-in freezers serving the pharmaceutical/biotech industry, contract biorepositories, and other critical product storage industries. For a complete review of our offerings of controlled environmental/stability rooms/chambers and services, visit our website.

## Bluechiip — Booth 18

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Tracking Solutions

Bluechiip offers a sample management suite of products for biobanks. Our system allows users to quickly register samples in batches and guide the user to the specific storage and retrieval location. The consumables have a Bluechiip wireless tag embedded inside that doesn't get affected by cryogenic temperatures, ice buildup and can even sense temperature at every scan. Therefore, the Bluechiip system solves issues like labels falling off or 2D barcodes not being able to read due to frost.

## Brooks Life Sciences — Booth 11 & 20

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Brooks Life Sciences, a division of Brooks Automation, provides the life science industry with the most comprehensive portfolio of sample management solutions, enabling researchers worldwide to accelerate innovation and improve patient health. We offer automated storage, cryopreservation, informatics, sample storage, lab services, transportation, consumables and instruments. Technologies and services span the entire cold chain supporting research, GMP, pre/clinical, cell therapy, and biologics.

**Bruker BioSpin Corp.** **Booth 22**

Based on the complete standardization of NMR analysis of biospecimens, Bruker has developed a biobanking solution for QC of incoming samples for storage. A comprehensive number of quality parameters is delivered, from pre-analytics to degradation state or unreported drugs. NMR can deliver many metabolic information using the same spectra, which can be stored together with the metadata. Such standardized spectra are completely exchangeable between biobanks and research groups.

**BSI Systems** **Booth 1 & 10**

BSI Systems (BSI and BioShare) is a collection of specimen inventory and management products for your facility. BSI manages your biobank with validated software that tracks the complete life cycle of all specimens within your repository. BioShare is a platform for sharing specimens and/or datasets with others in the research community by providing a central location for researchers to search, submit requests, and track requester correspondence.

**College of American Pathologists** **Booth 17**

As the world's largest organization of board-certified pathologists and leading provider of laboratory accreditation, including accreditation for biorepositories, and proficiency testing programs, the College of American Pathologists (CAP) serves patients, pathologists, and the public by fostering and advocating excellence in the practice of pathology and laboratory medicine worldwide. For more information, read the 2018 CAP Annual Report at CAP.ORG.

**CORIS Life Sciences Monitoring, Inc.** **Booth 32**

CORIS Life Sciences Monitoring provides remote 24/7 temperature monitoring of laboratory freezers at budget-friendly prices. Automated reporting, escalating and fully-customizable alerts, and artificial intelligence are just a few of our system's unique features. Our cloud-based platform does not require an on-site PC or server, and our patented technology does not require holes in firewalls--making it easy to get approval from your IT department. Contact us for a free quote.

**Cryotherm** **Booth 2**

For more than 50 years and with our own development, engineering and manufacturing departments, Cryotherm fulfills nearly every cryogenic need of our customers in the areas of life science, medicine, research and aerospace all over the world. For more information please visit us at www.cryotherm.de or www.cryotherminc.com.

At the ISBER Regional Meeting we would like to introduce our BIOSAFE® LN2 freezer line with capacities from 2000 up to 123.000 [2ml tubes] together with our new BIOSAFE®smart level control and monitoring unit. Whether as a stand-alone system, or together with our software packages BIOSAFE®view and BIOSAFE®iTrack, BIOSAFE® LN2 freezer are providing all feature and options that a state of the art biorepository nowadays needs.

**Ellab, Inc.** **Booth 23**

Ellab is a one-stop shop for all your validation and monitoring requirements. Ellab manufactures a wide variety of wireless data loggers, wired thermocouple validation systems and continuous monitoring systems that can be used in many pharmaceutical applications. These systems can record temperature, RH, CO2, pressure, vacuum and conductivity. Our equipment is available for purchase, rental, or our validation team can come on-site and perform qualification, validation or calibration services.

**Farrar Scientific** **Booth 13**

Farrar Scientific specializes in ultra-low temperature cascade refrigeration engineering for the pharmaceutical, biotechnology and biorepository applications. Our ULC -80C chamber offers: Redundant refrigeration systems and controls, -80˚C forced air circulation +/- 3C uniformity, faster temp. recovery, 145 cu.ft storage capacity, 47 sq.ft. of floor space, 288,000 vials storage, dynamic refrigeration control, energy balance design, power consumption is less than 4.8 kw.

## Fluidigm — Booth 9

Improving life. It's what drives us each day. At Fluidigm, we empower our customers to reveal meaningful insights in health and disease, identify actionable markers to inform life decisions and accelerate the development of more effective therapies. We focus on the most pressing needs in translational and clinical research, including cancer, immunology and immunotherapy. Harnessing proprietary microfluidics capabilities, we provide an unprecedented view into health and disease through our unique combination of innovative genomics solutions. As a trusted partner of leading academic, government, pharmaceutical, biotechnology and plant and animal research laboratories worldwide, we strive to increase the quality of life for all.

## Freezerworks — Booth 6

Freezerworks Sample Management Software

Configurable software solutions for biological sample and study management. Track sample data across multiple freezers while managing workflow. Flexible and user-friendly, Freezerworks puts the laboratory in control with easy to build fields, screens, and reports. Safeguard data with comprehensive security features, 21 CFR part 11 compliance, and cryogenic-safe barcode labeling.

## Hamilton Storage — Booth 21

Since 2007, Hamilton Storage, an affiliate entity of Hamilton Company, has been a global leader in the design and manufacture of automated storage systems for biological and compound samples. By safeguarding the integrity of even the most precious samples, our solutions and expert knowledge empower researchers to reach new heights of laboratory efficiency while remaining focused on life science research.

## ISBER — Booth 28 & 29

INTERNATIONAL SOCIETY FOR BIOLOGICAL AND ENVIRONMENTAL REPOSITORIES

ISBER is a global biobanking organization which creates opportunities for networking, education, and innovations and harmonizes approaches to evolving challenges in biological and environmental repositories. ISBER fosters collaboration, creates education and training opportunities, provides an international showcase for state-of-the-art policies, processes, and research findings, and innovative technologies, products, and services. Together, these activities promote best practices that cut across the broad range of repositories that ISBER serves.

## iSpecimen — Booth 4

iSpecimen was founded to address a critical challenge: how to connect life science researchers who need human biospecimens with the billions of specimens available in healthcare organizations worldwide. Our ground-breaking iSpecimen Marketplace solves this problem, reinventing the biospecimen procurement process to accelerate medical discovery.

## KAYE — Booth 7

Kaye - First in Thermal Validation & Environmental Monitoring

The Kaye product range is relied upon by the world's leading pharmaceutical and biotechnology companies to validate and monitor critical assets and processes as required by governing regulatory bodies.

No matter how complex or simple your monitoring needs may be, Kaye understands these unique requirements and offers solutions to automate the monitoring, alarming, and data collection of critical assets.

## Liconic Instruments — Booth 34

LiCONiC specializes in the design and manufacture of automated sample storage solutions used in laboratories and applications with special climate requirements. We are experts in sample management and tracking for the biorepository, blood banking, and

compound storage markets. Our 20+ years of leadership in this field has led to an installation base of several thousands of systems in operation worldwide. LiCONiC continually expands its product portfolio to address a rapidly evolving industry.

**Micronic / NBS Scientific** **Booth 24**

MICRONIC

Micronic manufactures innovative low temperature sample storage solutions—such as tubes, caps, and racks— to satisfy even the most complicated research applications in the life science industry. Micronic also manufactures high-quality laboratory automation equipment—such as cappers, decappers, and code readers—to streamline laboratory workflows. NBS Scientific is a Micronic distributor in the USA that also delivers other resources scientists need to discover groundbreaking insights in the lab.

**OpenSpecimen** **Booth 8**

OPENSPECIMEN
a krishagni product

OpenSpecimen is a comprehensive biobanking informatics platform used in 70+ biobanks across 16 countries. For example, Johns Hopkins, Emory, UPitt, UPenn, MSKCC, CUMC, Washington University, UC Davis, TJU, UUtah, UTexas, UMaryland, UMiami and so forth. It permits users to enter/retrieve data about specimen collection, storage, QA, and distribution of biospecimens. It enables biobanks to collect high-quality specimen annotations and powerful reporting module to find specimens of interest.

**PHC Corporation of North America** **Booth 26**

PHCbi

PHC Corporation of North America is a leader in laboratory equipment for biopharmaceutical, life sciences, academic, healthcare and government markets. The company is a subsidiary of PHC Holdings Corporation, Tokyo, Japan, which is a global healthcare company. Product lines under the PHCbi brand include energy efficient VIP® ECO, TwinGuard® and ultra-low temperature freezers, cryogenic and biomedical freezers, pharmacy refrigerators, incubators, autoclaves and plant growth chambers.

**Scinomix** **Booth 33**

scinomix

Scinomix provides laboratory automation solutions to customers in the life science industry. Currently, we meet a strong niche-market need for labeling tubes, vials and plates in many life science applications. We strive to be a leading provider in our field by committing to quality, reliability, value, and customer service. We strongly value each of our customers, and exceeding customer expectations is the motivation that drives our business.

**Thermo Fisher Scientific** **Booth 29**

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Thermo Fisher Scientific is the world leader in serving science. Our mission is to enable our customers to make the world healthier, cleaner and safer. Through our Thermo Scientific brand, we help customers accelerate innovation and enhance productivity.

**TTP Labtech** **Booth 31**

ttplabtech

TTP Labtech develops and manufactures robust automated solutions for automated sample storage and low volume liquid handling. Biobanking solutions from ambient to -80oC for 2D barcoded tubes offer truly scalable solutions for libraries from 50,000 to 500,000+ samples with unique modular interconnectivity and pneumatic remote delivery. Biobanking reimagined!

**Ziath LLC** **Booth 3**

Ziath

Ziath specializes in the development of innovative instrumentation control and information management products designed to simplify automation processes in life science organizations, from academia to the biotech and pharma industries.

Ziath prides ourselves on product development, customization and looks to provide a truly bespoke experience for each customer. Our customer-centric approach guarantees you access to high-quality scientific support.

# isber TOOLS

www.isber.org

## ISBER PROVIDES THE FOLLOWING TOOLS TO THE BIOBANKING COMMUNITY:

### SELF-ASSESSMENT TOOL (SAT) FOR REPOSITORIES

SAT for *ISBER Best Practices for Repositories, 4th Edition* coming soon!

### IBBL BIOREPOSITORY PROFICIENCY TESTING (PT) PROGRAM

Allows laboratories working with biospecimens to compare their performance to that of other expert laboratories from different sectors all over the world. PT works as an external quality assessment tool to verify the accuracy, precision and efficiency to laboratories' processing and testing methods.

### PRE-ANALYTICAL BIOREPOSITORY EXTERNAL QUALITY ASSESSMENT (EQA) SURVEY

Allows participants to benchmark their pre-analytical practices to other biorepositories. Participants receive an individualized report which includes the results and statistics obtained by all biorepositories which have participated.

**ALL ISBER TOOLS ARE AVAILABLE FREE TO MEMBERS!**

### INTERNATIONAL REPOSITORY LOCATOR (IRL)

Helps investigators locate biospecimen data repositories by developing a directory of repository information that can be searched online.

### STANDARD PRE-ANALYTICAL CODE (SPREC)

Identifies and records the main pre-analytical factors that may have impact on the integrity of sampled clinical fluids and solid biospecimens and their simple derivatives during collection, processing and storage.

### BIOSPECIMEN STABILITY TESTING CALCULATOR (STABCALC)

Determines sample stability, including freeze-thaw stability and storage stability. STABCALC facilitates stability studies performed by biobanks on different types of biospecimens by identifying potential variabilities in pre-analytical procedures.

### NEUROLOGICAL DISEASE METADATA

Access metadata related to the biorepository level, the collection level and the individual sample level. Housed in a RedCap server, this tool has been configured in the scope of neurological disease collections, but can be used for other disease collections too.

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# The sample tracking you need. The workflow you'll love.

## Advanta Sample ID Genotyping Panel

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