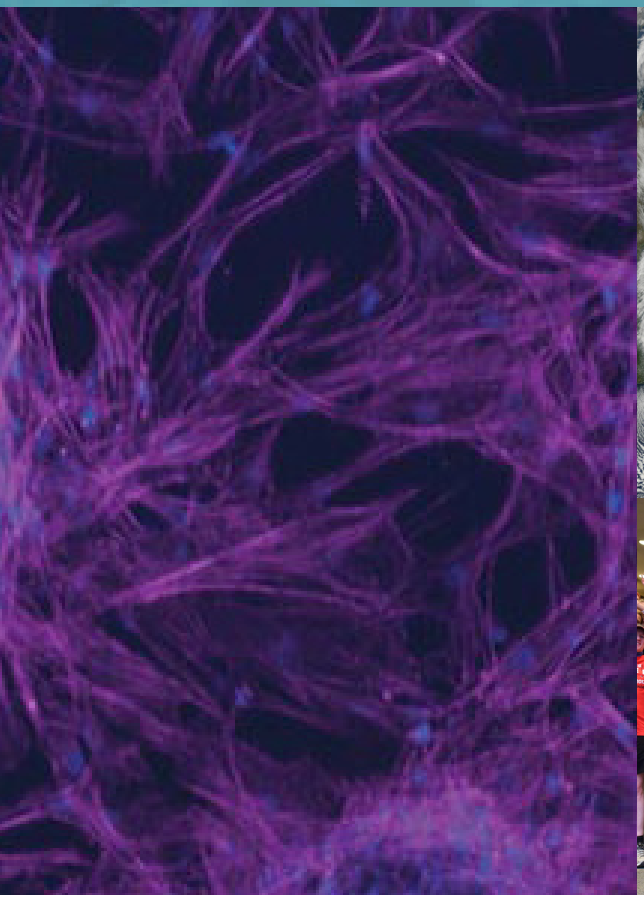
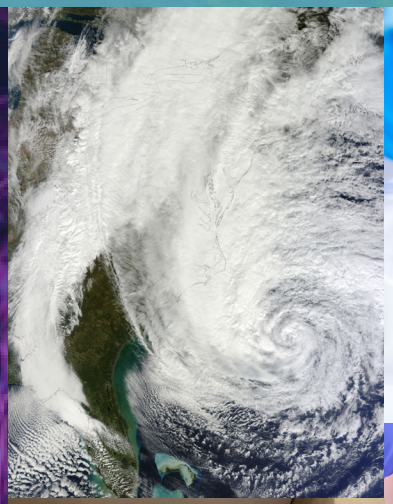
isber




20 YEARS

ISBER TWO DECADES AND BEYOND: HONORING OUR PAST, CELEBRATING THE PRESENT, AND ENVISIONING OUR FUTURE

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FOREWORD

The history of the International Society for Biological and Environmental Repositories (ISBER) is proof of how an important idea, like the development of a society focused on the quality of biobanking, can come to fruition and evolve into existence when there is committed leadership, exceptional staff and interested, experienced and enthusiastic members who are willing to participate in the development and growth of a young and rapidly maturing bioscience that is essential to biomedical research and the sustainability of the environment.

ISBER was created to be an international organization and forum that would address repository management issues, share ideas and expertise, facilitate communication and education, manage biospecimen data, and provide a central voice for biorepositories. The primary goals of the society included education, regulatory inputs, consensus standards and repository accreditation and certifications.

ISBER is proud of its many accomplishments over the past 20 years, but there is still much to be done as ISBER moves forward with strong, supportive management and visionary and thoughtful leadership. ISBER will continue to move from strength to strength and ever-increasing achievement into its third decade as the only global forum that addresses the harmonization of scientific, technical, legal and ethical issues relevant to repositories of biological and environmental specimens.

ISBER would like to acknowledge and thank all that contributed to the creation of this publication:

- Fay Betsou
- Marianna Bledsoe
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- Sofia Spyrou
- Tasmin Tarling
- Jim Vaught
- Kerry Wiles
- Andy Zaayenga

ISBER CELEBRATES ITS 20TH YEAR

Authors: Zisis Kozlakidis, Debra Leiolani Garcia

In 1999, the International Society of Biological and Environmental Repositories (ISBER) was formed (www.isber.org) by a small group of visionaries; colleagues stemming from all different walks of expertise, including clinical, academic, public and private sectors, with an interest in preserving biospecimens and their associated data for future research and utilization. At that time, an internet search for the word "biobank" or "biorepository" would have returned almost nothing. Today, confirming the predictions of those visionary founders of ISBER, there are millions of results. Two decades is a very short period of time for a global concept to become established and flourish, such that it is now considered an infrastructural component vital to delivering modern, precision research. This sustained growth of biobanking and its eventual acceptance as a discipline forms part of ISBER's legacy. Since 1999, academia, biobankers, patient advocates, industry and state representatives, lawyers and others with an interest in biobanking have met at least once per year during the ISBER Annual Meeting to share and expand their expert knowledge in the field.

This global focal point of ISBER meetings have created a strong foundation for the regular exchange of experiences, networking opportunities, as well as the development of best practices and creation of educational tools with a global reach, especially as the biobanking field develops in Asia, Eastern Europe, Africa and South America. However, as the global financial crisis developed into an enduring pressure for tighter cost control, expense justification and even cost retrieval, new operational models emerged for long-term sustainability in biobanking - often presented first within ISBER. Biobanking success cannot be gauged any longer by simple 'supply and demand' principles and judged on the efficiency of the ability to move samples. Instead, biobanks should be judged on their ability to act as centres of excellence that generate knowledge, interact with the academic community and the wider public, disseminate the discovery of clinical innovations and implement new practices. The ISBER Advisory Committees, Working Groups and Special Interest Groups have worked tirelessly to codify these pressures, trends and new knowledge and have already published a substantial body of work aiding the entire global community.

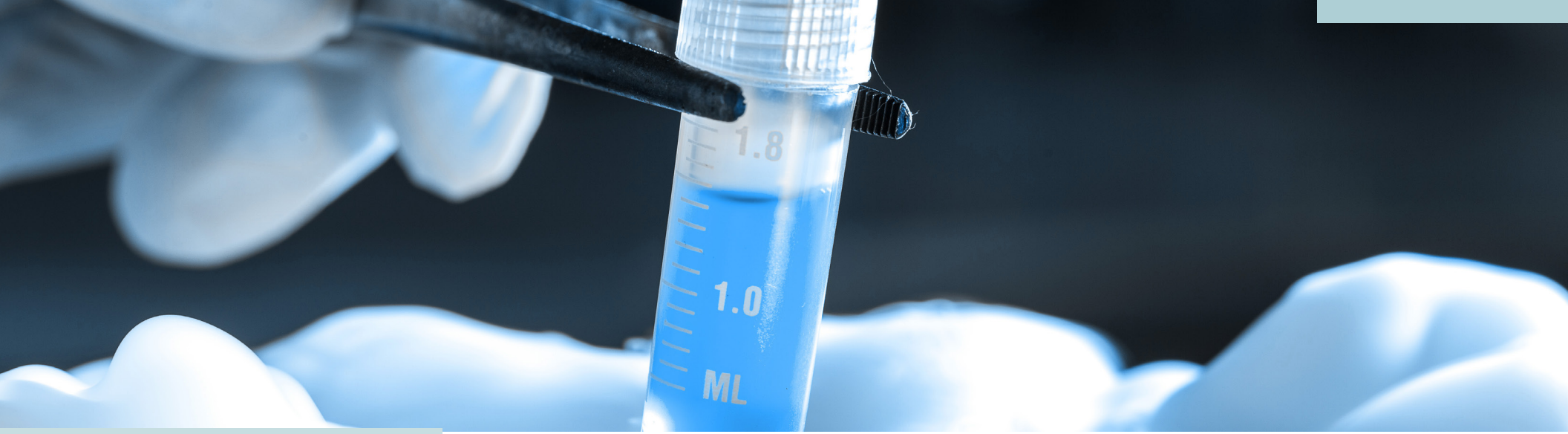
Two of the most important aspects of a biobank are consistency and quality. The validity of the data generated by biobanked samples, depend on their quality, which is in turn dependent on the use of stringent practices and standards in collecting the biospecimens and delineating subject characteristics. Therefore, standardization and harmonization of biobanking practices are of paramount importance. ISBER has been critical in this aspect; it remains the leading global focal point for the exchange of expertise and information through annual and regional meetings and the ISBER forum.

In 2005, ISBER developed and published the First Edition of ***ISBER Best Practices for Repositories***, which has been revised at regular intervals with the Fourth Edition including an addendum on cryopreservation released in 2018 and translated into many languages,

eventually forming one of the core reference texts for the development of the international biobanking standards, such as the ISO 20387:2018. Furthermore, ISBER has formed an array of collaborations with a number of institutions and societies globally, such as CAP, Society for Cryobiology, CTRNet, CNGB, ABNA, CIBER, IARC/WHO and others to work on and promote globally matters of common interest.

The science of biobanking is very broad, applies globally and covers collections of plant, animal, and human specimens. This subject variation has been demonstrated repeatedly in the publications featured in ***Biopreservation and Biobanking***, the society's international peer-reviewed journal. Subjects vary from the nature of informed consent and other ethical issues, to biospecimen science, sustainability, implementation of artificial intelligence in available digital banks, pathology-based technical reviews and many others.

Based on these and other publications over the past two decades, the biobanking field has enjoyed a period of sustained investment, growth, wider scientific acceptance and development. Additionally, individual biobanks have benefited by support from very active, scientific community-driven societies, such as ISBER, and others. Biobanking is now often recognized as an essential activity underpinning scientific breakthroughs. The current document articulates the distilled efforts and history of ISBER over the past two decades, the different individuals that have shaped the society into its current form, as well as the many efforts to investigate the diverse aspects ISBER is an active society, run by its members and responding to the needs of its the biobanking field. We hope the First Edition of this document which was initiated at the celebration of the 20th anniversary of the society will provide the inspiration for many more years to come. The book will be updated as a living document on the ISBER website to capture the valuable work of its membership and the global biobanking community.



HOW IT ALL BEGAN...

Author: Elaine Gunter

During an annual review meeting with American Type Culture Collections (ATCC) contractors in 1998, Elaine Gunter, Frank Simione, Phil Baird and the Project Officer of the Center for Disease Control (CDC) Specimen Packaging, Inventory and Repository (CASPIR), Barbara Kilbourne, discussed how they were often asked to speak and present at various workshops or to write articles on biospecimen banking. The group agreed a niche society dedicated to all types of specimen banking was needed since this critical topic was often lost in conversation during bigger scientific conferences. Fortunately, it was to the group's advantage to have Frank and Phil involved because they knew everybody in Washington who was in the repository business at the time.

A year later, Jim Vaught participated in a discussion, which focused on the creation of a group that would share and eventually harmonize the biorepository practices. One of the outcomes of the discussion was to sponsor a meeting that brought together people that collected, processed, stored and used biospecimens from biomedical and environmental research studies. As a result, the first "pre-ISBER" meeting was sponsored by the U.S. National Cancer Institute's (NCI) Division of Cancer Epidemiology and Genetics operations budget. This meeting was the starting seed of the soon to be incorporated ISBER.

Around the same time, the Cooperative Human Tissue Network (CHTN) also discussed the need to create a human specimen resource society. William (Bill) Grizzle wrote to a number of repositories asking if any were interested in participating and creating a society for biorepositories. The recipients positively responded to Bill's inquiries. The CHTN then became aware of the CDC group's effort and contacted Elaine about merging the two efforts into one organization.

On April 27, 1999 in Manassas, VA, Phil Baird and Frank Simione of the ATCC, Elaine Gunter and Barbara Kilbourne of CDC, Elise Eiseman of the Rand Corporation, Frank Bellino of National Institute on Aging (NIA), Dale Lawrence of National Institute of Allergy and Infectious Disease) (NIAID), Jim Vaught of the National Cancer Institute (NCI), and Steve Wise of National Institute of Standards and Technology (NIST), met and collectively defined what the society should or could be as well as what it could do for its membership. After two additional meetings bringing in CHTN participants, Roger Aamodt, Bill Grizzle and Kathy Sexton, as well as Elio Riboli, Bryan Wakeford, Mark Cosentino, Kathy Shea, and other experts into the fold, ISBER was formally chartered. The first ISBER meeting was held in 2000 at an ancillary segment of an NCI-sponsored specimen-banking workshop in Bethesda, MD. Sandra Wolman, at Universities Associated for Research and Education in Pathology served as the Administrative Officer and mentor and the Federation of American Societies for Experimental Biology was the first member sponsor organization.

As ISBER celebrates its 20th anniversary, it is both illuminating and informative to reflect and review on how it has continued to grow and become a global force in biobanking. ISBER connects biobanks around the world through promotion of best practices to ensure quality through standardization and harmonization of biobanking practice.

ISBER FOUNDERS & PRESIDENTS

FOUNDERS

The founding members envisioned most of the current ISBER characteristics in that ISBER was to be an international organization that would be a forum to address issues in repository management, sharing expertise and ideas, facilitating communication and education, managing biospecimen data, and providing a central voice for biorepositories. Together the following individuals are credited with this vision. These founding members collaborated, harmonized and dedicated their time and resources to establish this worldly society that strives to educate the biorepository community, develop the repository best practices and share information and tools within the society. Thank you to these following individuals for making all this happen:

- Roger Aamodt
- Phil Baird
- Frank Bellino
- Marianna Bledsoe
- Mark Cosentino
- Elise Eiseman
- William Grizzle
- Elaine Gunter
- Marianne Henderson
- Barbara Kilbourne
- Dale Lawrence
- Elio Riboli
- Kathy Sexton
- Kathy Shea
- Frank Simione
- Jim Vaught
- Bryan Wakeford
- Steve Wise
- Sandra Wolman

The president role has been held by the following individuals:

- 2000 - 2001 Elaine Gunter
- 2001 - 2002 Jim Vaught
- 2002 - 2003 Roger Aamodt
- 2003 - 2004 Robert Hanner
- 2004 - 2005 Ted Mifflin
- 2005 - 2006 William Grizzle
- 2008 - 2009 Robert Hewitt
- 2009 - 2010 Peter HJ Riegman
- 2010 - 2011 Scott D. Jewell
- 2011 - 2012 Marianne Henderson
- 2006 - 2007 Frank Simione
- 2007 - 2008 Marianna Bledsoe
- 2012 - 2013 Katheryn Shea
- 2013 - 2014 Fay Betsou
- 2014 - 2015 Andy Zaayenga
- 2015 - 2016 Jim Vaught
- 2016 - 2017 Brent Schacter
- 2017 - 2018 Zisis Kozlakidis
- 2018 - 2019 David Lewandowski
- 2019 - 2020 Debra Leiolani Garcia
- 2020 - 2021 Daniel Catchpoole
- 2021 - 2022 Piper Mullins

TIMELINE

1998
ISBER concept discussed amongst various groups and individuals

1999
1st meeting to discuss and create ISBER

2000
ISBER chartered newsletter launched

2001
1st stand alone annual meeting, ISBER website launched

2002
ISBER journal, *Cell Preservation Technology*

2003
5-yr strategic plan developed

2004
1st International ISBER Meeting in Perugia, Italy

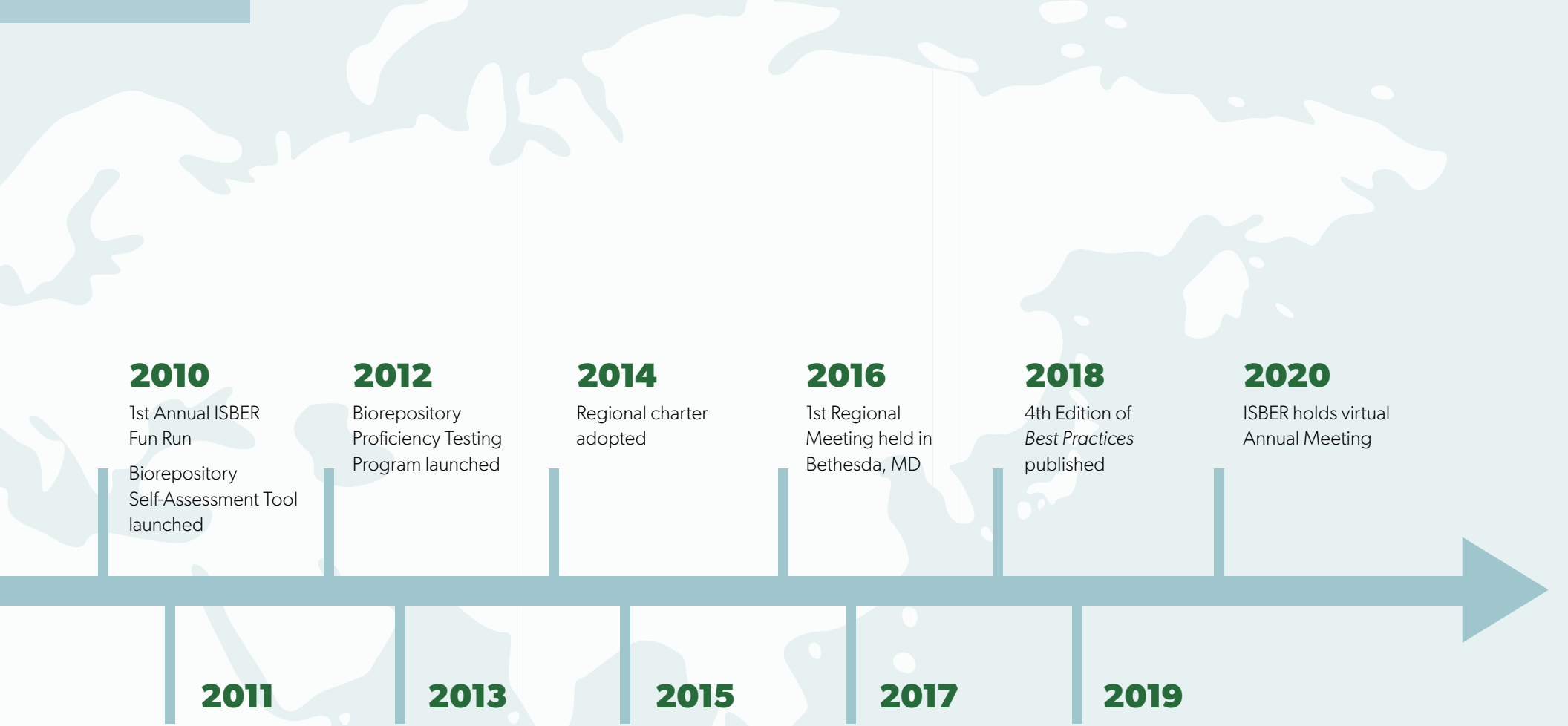
2005
1st Edition of *Best Practices* published

2006
2nd Edition of ISBER Best Practices published

2007
Creation of Global Expansion Fund

2008
3rd Edition of ISBER *Best Practices* published

2009
Creation of ISBER Travel and Special Service awards


2010
1st Annual ISBER Fun Run
Biorepository Self-Assessment Tool launched
2011
ISBER New Product Award launched
ISBER becomes an independent not-for-profit society
2012
Biorepository Proficiency Testing Program launched
2013
ISBER journal approved for Medline & PubMed indexing
ISBER tools developed
2014
Regional charter adopted
2015
Best Practices translated into Chinese & Korean
2016
1st Regional Meeting held in Bethesda, MD
2017
Global Biobank Week held in Stockholm, Sweden
2018
4th Edition of *Best Practices* published
2019
ISBER's first meeting in China
2020
ISBER holds virtual Annual Meeting

LEADERSHIP, STRUCTURE & COMMITTEES

Authors: Marianna Bledsoe, Cathy Seiler, Daniel Simeon-Dubach

In the first decade of ISBER, the President-Elect was responsible to be the Chair of the next Annual Meeting's program. Committee members were nominated by ISBER leadership. As the role of the Program Chair evolved, we adopted the practice of naming co-Chairs as the leaders of Annual Meetings. The "business" of managing the Annual meeting organization and now the Regional meetings was recognized as a core asset by ISBER leadership, and the Organizing Advisory Committee (OAC) was formed during the Annual Meeting in Sydney, Australia in 2013 to advise.

ISBER Science Policy Advisory Committee (SciPol)

Since its establishment in 2011, the SciPol Committee has become a voice for the global biorepository community on biorepository policy issues. The SciPol Committee has helped to shape important global and regional regulations and policies related to biorepositories by providing input on them in response to calls for public comment1,2. These include international and regional guidelines such as the WMA Declaration of Taipei on Ethical Considerations Regarding Health Databases and Biobanks, the Council of Europe Recommendations on Research on Biological Materials of Human Origin and the Council for International Organizations of Medical Sciences International Ethical Guidelines for Biomedical Research Involving Human Subjects. In addition, the Committee also provided input on important regional regulations such as the revisions to the US Federal Policy for the Protection of Human Subjects (Common Rule), the European Union General Data Protection Regulations (EU-GDPR), and the Australian National Statement on Ethical Conduct in Human Research. Of note, ISBER comments were cited in the US Presidential Commission for the Study of Bioethical Issues report entitled, 'Anticipate and Communicate: Ethical Management of Incidental and Secondary Findings in the Clinical, Research, and Direct-to-Consumer Contexts.'

The SciPol Committee has developed educational materials around complex ELSI issues in biobanking and engaged with policy makers on important science policy issues. For example, the SciPol Committee provided background information and reviewed draft scripts for a video that the US Department of Health and Human Services Office of Human Research Protections has developed for the public on research use of human biospecimens and data.

The SciPol Committee continues to educate ISBER's membership regarding research ethics communities on practical and policy issues related to biobanking and human biospecimen research. This includes planning and presenting at ISBER meetings on the changes to the US Common Rule and the global implications of the EU-GDPR. Additionally, the Committee collaborated with Public Responsibility in Medicine and Research (PRIM&R) to organize all day advanced tissue banking programs and educational workshops to help educate the research ethics community on these and other topics related to biobanking.

Finally, the SciPol Committee continues to explore important emerging ELSI and policy issues related to biobanking such as the ELSI challenges related to the COVID-19 pandemic, the return of research results, and community engagement in biobanking. The goal is to develop tools and resources for the biobanking community to help address these issues.

ISBER SCIENCE POLICY COMMITTEE CONTRIBUTIONS TO REGULATORY AND POLICY DEVELOPMENTS
(available for download at https://www.isber.org/page/PositionStatements)

Oct 26, 2011 Federal Government of U.S.A. Health and Human Services Department (May 31, 2011) proposed changes to Common Rule.

Jan 12, 2012 Australian government National Health and Medical Research Council (NHMRC) proposed revisions to Chapter 3.4: human tissue samples and Chapter 3.6: Human stem cells of the National Statement on Ethical Conduct in Human Research.

Mar 4, 2013 Response to the European General Data Protection Regulation Proposal as provided by the European Parliament and the Council of the European Union.

July 8, 2013 Response to the U.S. Presidential Commission for the Study of Bioethical Issues Request for Comments on Issues Related to Incidental Findings

Nov 20, 2013 Response to the Request for Public Comments on the Draft Genomic Data Sharing (GDS) Policy

July 1 2014 Comments on the International Code of Conduct for Genomic and Health-Related Data Sharing

Aug 12, 2014 Comments on the Working Document on Research on Biological Materials of Human Origin to the Committee on Bioethics of the Council of Europe

June 11 2015 Comments on the World Medical Association (WMA) Declaration of Ethical Considerations Regarding Health Databases and Biobanks

Nov 16, 2015 Reprinted by permission from the American Association for Cancer Research: Grizzle WE. Missed opportunities and lost lives: consequences of some proposed changes to regulations on research with human tissues. Clin Can Res. 2015 19. [Epub ahead of print]. doi:10.1158/1078-0432.CCR-15-2513.

Nov 18, 2015 Comments on Notice of Proposed Rulemaking for Revisions to the Common Rule

Feb 29, 2016 Comments relating to the CIOMS International Ethical Guidelines for Biomedical Research Involving Human Subjects

Jan 3, 2018 Comments relating to the Proposed Changes to TCPS 2 (2014) Guidance for Research involving Human Cells and Cell Lines

Nov 2019 Guidelines 3/2018 on the territorial scope of the GDPR (Article 3) - Version for public consultation - Adopted on 16 November 2018.

August 1, 2019 Comments on GA4GH Data and Security Policy

January 7, 2020 Comments on the Draft NIH Policy for Data Management and Sharing

April 29, 2020 Comments on Application of GDPR to Biomedical Research

June 10, 2020 Comments on Responsible Data Sharing to Respond to the COVID-19 Pandemic: Ethical and Legal Considerations (v 2.0): The Perspective of the Regulatory and Ethics Work Stream of the Global Alliance for Genomics and Health.

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1. N Sieffert, M Bledsoe. ISBER Science Policy Committee: The International Voice for Repositories on Evolving Policy Issues. Biopreservation and biobanking 11 (6), 399-400 1, 2013.

2. MJ Bledsoe, DL Garcia. ISBER's Role in Shaping Global Policies and Regulations Biopreservation and Biobanking 19 (1), 94-96, 2021.

ISBER Education and Training Committee

The Education and Training (E&T) Advisory Committee works to identify and implement mechanisms to ensure that ISBER members have access to information and tools to effectively operate repositories for the preservation of specimens for future research and analysis. The E&T Committee organizes, markets, and manages workshops for the ISBER Annual Meetings, and has compiled a list of educational videos available on the ISBER website to serve as resources for members who wish to quickly review biobanking related procedures and topics. This committee has also worked to implement an educational needs survey to identify education gaps in the biobanking industry and inform the development of educational projects for biobanking.

The E&T Committee's goals include creating and coordinating educational webinar series on relevant topics, such as the Best Practices, developing guides, tools, and SOPs related to biobanking and repositories, and creating ways for the public to become more aware of biobanking through educational campaigns and initiatives.

PUBLICATIONS

International Society for Biological and Environmental Repositories (ISBER) (2005) Best practices for repositories I: Collection, storage, and retrieval of human biological materials for research. Cell Preserv Technol; 3:5–48.

International Society for Biological and Environmental Repositories (ISBER) (2008) Best practices for repositories: Collection, storage, retrieval and distribution of biological materials for research. Cell Preserv Technol; 6:3–58.

Campbell LD, Betsou F, Garcia DL, et al. (2012) Development of the ISBER Best Practices for repositories: Collection, storage, retrieval and distribution of biological materials for research. Biopreserv Biobank; 10:232–233.

Pitt KE (2012) Development of a global certification program for biorepository technical professionals. Biopreserv Biobank; 10(1):70-1.

Pitt K and Betsou F (2012) The ISBER Best Practices Self Assessment Tool (SAT): Lessons learned after three years of collecting responses. Biopreserv Biobank; 10(6):548-9.

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O'Donoghue S, Matzke L, Watson P (2018) ISBER Best Practice-Based Education: ISBER-Canadian Tissue Repository Network Introduction to Biobanking. Biopreserv Biobank; 16(1):13-15.

Schacter B, Sieffert N, Hill K, Tanabe P, Simeon-Dubach D (2020) A New Qualification for the New Year: ISBER and American Society of Clinical Pathology Board of Certification Announce New Qualification in Biorepository Science Examination for Biobank Technicians. Biopreservation and Biobanking. Feb 2020.43-44.

ISBER Standards Committee

One of the main goals of ISBER is to develop and deliver recommendations and guidelines to the biobanking community. Therefore in 2003, four years after founding ISBER, the first ISBER Best Practices were published. The second and third editions extended the scope geographically along with updated content. With each new update of the ISBER Best Practices, the task became more and more complex requiring better organization of the Best Practices.

Therefore, it was required to better organize this core task of ISBER within the structure of ISBER. One crucial step was to establish the ISBER Standard Committee in 2017. The purpose of Standards Committee is to serve as an advisory group that provides biobanking expertise on behalf of ISBER to establish consistent biobanking standards. The primary focus is on the development and maintenance of the ISBER Best Practices, contribution of biobanking standards, certification criteria and general polices.

The Standards Committee was established at the late stage of the heavily revised update of the 4th edition of ISBER Best Practices, which was published early in 2018 and reviewed by the committee. Standards Committee together with other committees like Communication, Marketing, and Education & Training was heavily involved in the publication, implementation and distribution of the 4th edition of the ISBER Best Practices. It also advocated for the translation into different languages as a strong sign of ISBER's international orientation. The English original and all translations have been uploaded to the ISBER website. From there, anyone can download 4th edition for free. As of early 2021, over 4000 people have downloaded the ISBER Best Practices 4th edition. The majority of them are not ISBER members. This group is a great opportunity for ISBER to grow. The Standards Committee continues to update existing tools as develop new ones that are based on the ISBER Best Practices. By doing so the Standards Committee will help to reach the primary goal of ISBER to develop and deliver recommendations and guidelines to the international biobanking community.

ISBER STANDARDS COMMITTEE PUBLICATIONS

Allocca CM, Bledsoe MJ, Furuta K, Ramirez NC (2017) ISO/TC276/WG2 Biobanks and Bioresources: Draft International Standard Is Now Available for Comment. Biopreserv Biobank; 15(4):399-401

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ISBER Working Groups: *Providing a Global Platform for the Development of the Field*

Author: Fay Betsou

Since their creation in 2008, different Working Groups (WGs) were created over the years. The purpose of ISBER WGs is to bring people together from all over the world with similar interests, complementary expertise and who are willing to work together towards a specific output, such as to identify or develop tools, solutions or publications on the biobanking aspects that correspond to the focus of each WG.

WGs have been instrumental in addressing challenges for the biobanking field globally through highly successful tools and a number of scientific peer-reviewed publications have also been produced over the years. Below is a list of the scientific peer-reviewed publications from ISBER WGs with new publications added on a continuous basis.

PUBLICATIONS BY ISBER WORKING GROUP ON BIOSPECIMEN SCIENCE

Betsou F and the ISBER Working Group on Biospecimen Science. (2009) Human Biospecimen research: Experimental Protocol and Quality Control Tools. Cancer Epidemiol Biomarkers Prevention; 18:1017-1025.

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Kofanova O, Davis K, Ammerlaan W, et al. (2014) Viable mononuclear cell stability study for implementation in a proficiency testing program: impact of shipment conditions. Biopreservation and Biobanking; 12:206-216.

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20 YEARS OF ISBER AND ITS EFFECTS ON THE BIORESOURCE COMMUNITY

Authors: William Grizzle, Kathy Sexton

The bioresource community has significantly changed in the past 20 years; many of these changes are due to the work and dedication of ISBER. Twenty-one years ago, a group of experts met at the ATCC headquarters to discuss the development of bioresource organization. As we looked through the meeting documents from this meeting, we were amazed at the "need, benefits, goals and membership" envisioned by that early group of bioresource pioneers, and how ISBER, through the years, has risen to address these visions. ISBER has improved and will continue to grow the mechanisms for the bioresource community to communicate, network, harmonize, educate, and innovate.

Before ISBER, bioresources had no mechanism to communicate and share ideas. ISBER has greatly increased the ability for bioresource personnel to know about and communicate with one another through the development of the ISBER online forum. The ISBER forum is a critical tool that provides the bioresource community a mechanism to communicate and ask questions within the global bioresource community. It also helps bioresource personnel connect with one another and decrease the feeling of isolation when it comes to bioresource management issues.

Annual and regional ISBER meetings bring together bioresource professionals, technicians, commercial organizations, including vendors, and others associated with the bioresource community. The connections forged through ISBER have created a sense of camaraderie and friendship among the bioresource community worldwide, as ISBER members share experiences with one another and realize that colleagues around the world are sharing similar experiences, headaches and challenges. The ability to network with other bioresource professionals has brought the bioresource community closer together. In addition, ISBER's arrangements with its affiliate and associate partners has forged bonds and collaborations with other bioresource associated organizations.

Through various ISBER committees, meetings, and workshops, ISBER has educated individuals and organizations new to the bioresource community, as well as veteran bioresource personnel in many different topics related to bioresource management. As envisioned by the founders of ISBER, the organization has provided access to expertise and technical materials, coordinated efforts in address technical issues, and raised awareness of and provides assistance with ethical and regulatory issues. The official ISBER journal, "Biopreservation and Biobanking", has greatly improved the operations of bioresources around the world by providing peer-reviewed publications that address bioresource operations and bioresource science.

ISBER's Best Practices for Repositories has allowed bioresources around the world to work together to harmonize biospecimen management and practices. This has been possible through ISBER's dissemination of information on bioresource issues, through development of consensus positions, and through access to accreditation and certification processes available to bioresources.

ISBER's Best Practices for Repositories has allowed

bioresources around the world to work together to harmonize biospecimen management and practices. This has been possible through ISBER's dissemination of information on bioresource issues, through development of consensus positions, and through access to accreditation and certification processes available to bioresources.

Through its partnership with vendors, ISBER has encouraged the development of products and has fostered innovation to serve the bioresource community. ISBER has served as a mechanism for vendors to work closely with bioresource staff to recognize their needs and develop new products.

There are a number of specific bioresource-related areas in which we have noted great changes in the past 20 years, largely attributable to ISBER's influence. By fostering communication, networking, education, harmonization via its journal, meetings, innovations and product development, ISBER has had a profound impact on all areas related to bioresource management and operations. Specific areas for which ISBER has facilitated significant improvements include quality management, biospecimen utilization in research and associated medical advances, informatics, biospecimen science, regulatory and ethical issues, bioresource operations and safety. By ISBER's interactions with commercial companies including its vendors, equipment and other products supporting bioresources have been developed as well as improved.

Thanks to ISBER the bioresources of today are quite advanced in all aspects compared to those that were in operation prior to its founding. We should all look forward to the advances to bioresources and subsequent advances in medical care that ISBER will facilitate over the next 20 years!



HURRICANE SANDY: HOW THE INCONCEIVABLE BECAME CONCEIVABLE

Author: Maryann Huie

In-con-ceiv-a-ble (adj): "not capable of being imagined or grasped mentally, unbelievable." It was October 2012 and a tropical storm was heading towards the East Coast of the United States. No one could have predicted that this was going to be the deadliest storm of the 2012 Atlantic storm season. Hurricane Sandy hit Cuba as a Category 3 hurricane, weakening to a category 2 hurricane as it headed toward the Northeastern United States. As a native New Yorker, I assumed that we would have a bout of rainy weather, strong winds and empty supermarket shelves as people prepared to hunker down to wait out the storm. There was no indication that Hurricane Sandy would develop into a "superstorm," one of the largest on record.

Our labs at NYU Langone and Bellevue Hospitals were on emergency backup power. All non-essential equipment was shut down and the electrical and maintenance staff was on stand-by in the event any problems were to arise. I went home that evening anticipating little or no damage to all our freezers and the precious samples stored within them.

Inconceivable. New York City was hit by a fierce and deadly hurricane named Sandy that breached our never before breached seawall on the evening of October 29, 2012. Streets and tunnels were flooded, our subway system was submerged, cars floated down streets. There was an explosion at the Con Edison electrical power substation serving NYU-Langone and Bellevue hospitals. Large swathes of the city were powerless by 9 p.m.

Inconceivable. NYU-Langone and Bellevue hospitals, envied for their beautiful views of the East River, were flooded. Patients were evacuated to higher ground. Then came word that the hospitals' electrical generators, including the emergency generators, all located in the basements, were submerged. We were powerless, emergency power was meaningless. It was the middle of the night. How were going to survive this disaster?

This was seven years ago. The concept of "emergency preparedness" and contingency planning against the inconceivable was in its infancy. We were working blind. Laboratory and hospital staff was called in the next morning.

Many lost cell phone connectivity and were unreachable. My boss, drove in from New Jersey, bringing dry ice purchased from a local beverage center. In the absence of a working public transit system, able-bodied friends and family who were able to walk to the hospitals were recruited to assist. We were to face many challenges in the days after the superstorm. We located a commercial biorepository in New Jersey that could set up temporary freezer facilities using refrigerated trucks and hundreds of pounds of dry ice. But gas pumps were empty or not working, deliveries were delayed due to inaccessible roads, gas rationing was implemented. We had to wait an eternity for our knights in their shining trucks filled with dry ice and working freezers. In desperation, we walked up dark stairwells carrying dry ice to pack into freezers, down the same dark stairwells carrying as many precious samples as possible to any freezer we could find. Brave volunteers and employees formed a "fire brigade" in the stairwells to expedite the transfer of samples. It was a nightmare. Some risked moving whole freezers from floor to floor in a last-ditch effort to find working emergency electrical outlets. Our samples were at risk, decades of work and resources were housed in those freezers, we had to make every effort humanly possible. We rallied. We rose to the challenge. We had to improvise. We had no emergency plan in the event that the inconceivable became conceivable.

Months later, the majority of our samples were safe albeit stored somewhere off site. Institutions began the slow and torturous road to repair and rebuilding.

We worked for months in makeshift labs with limited resources. Insurance claims were made. New emergency plans were designed to safeguard the hospital's electrical generators (now all above ground), the city built better seawalls, barriers to protect tunnels from flooding, drainage systems. NYU-Langone had the financial resources to sustain our recovery efforts and continue payroll. We were VERY Lucky.

The cost of Hurricane Sandy cannot be measured only in monetary terms. We were lucky that the majority of our samples were not affected due to agile and quick thinking by our administration and the heroic and selfless efforts by all staff and volunteers. Yet, despite all our efforts, Hurricane Sandy reminded us of our vulnerability; animal facilities and MRI suites located in the basements were flooded and in shambles, the animal facilities alone suffered over $25 million in damages. Confidence that we were impervious to natural disaster in the middle of New York City, one of the greatest cities in the world, was lost.

Hurricane Sandy was not a singular event. Tropical storm Allison flooded University of Texas Health Science Center-Houston (UTHSC-H) in 2001. Approximately 1 million square feet of UTHSC-H was unusable; animal facilities in the basements were flooded resulting in huge loss of laboratory animals. Other institutions including Baylor College, Texas Heart Institute and Texas Medical Center were also affected by Tropical Storm Allison. Hurricane Ike effectively isolated the University of Texas Medical Branch (UTMB) on Galveston Island in 2007 when roads to and from the island were flooded. Staff stranded at UTMB worked tireless for 3 days before roads reopened and relief staff arrived. UTMB's clinics were closed for months resulting in 20% loss of revenue.

Perhaps one of the most vivid disasters in recent history is when Hurricane Katrina hit the city of New Orleans in 2005. Images of refugees suffering for days in the Super Dome, under inhumane conditions, was broadcast widely on all the televised networks. A State of Emergency was declared, highlighting the fatal engineering flaws in the design of the city. Louisiana State University (LSU) suffered massive loss, payroll was not met and over 51 full time and 34 part time faculty were dismissed. It was over 11 years after the storm before significant recovery and rebuilding of New Orleans was to begin.

Unspoken and unforeseen damages can also occur in the wake of a disaster, be it natural or man-made. Arson, theft and other property damages are not uncommon. Animal rights activists can be re-energized at the loss of animal lives. Payroll may cease as institutions suffer financial losses.

Personal and psychological suffering may arise as a result of loss and struggles associated with working in distant and/or makeshift labs. Career path trajectories can be derailed; choices whether to stay or relocate for a fresh start need to be weighed. Data breeches may occur.

What have we learned after these disasters? Are we imperious to risk, damage and lost? Of course not! We can only be prepared. Prepared physically, mentally, financially and emotionally. All labs, but biobanks and biorespositories in particular, need to have a formal emergency preparedness and recovery plan. We have been entrusted to safeguard precious and often irreplaceable samples and data. Guidelines, such as those outlined in the latest ISBER Best Practices publications should be taken seriously. On this, the 20th Anniversary since the establishment of ISBER, numerous advancements have been made to prepare us for an emergency and recovery in its aftermath.

But we must remember that this is not a static field, new challenges arise with each new year. Case in point: The Svalbard Global Seed Vault buried in Permafrost on the side of a mountain on the Norwegian island of Spitsbergen in the Arctic Circle. Housing seed samples of all the plants known to human-kind, the Seed Vault is considered a botanical resource in the event of catastrophic deforestation. Permafrost once considered to be an absolute failsafe is now vulnerable; the idea that having Seed Vault buried in Permafrost to maintain freezing temperatures to vouchsafe the seed samples in the event of system failure is now being challenged. Global Climate Change/Warming is increasing temperatures in the Arctic Circle, causing melting ice and leakages into the Vault. Fortunately, no seeds have been lost thus far, but the Vault which formerly required minimal human surveillance now requires constant human monitoring.

As for me? I've moved on to the Cardiovascular Biobank and 'Omics Facility at Mount Sinai Hospital. It is located on high ground in the middle of Manhattan, far away from the East and Hudson Rivers that surround New York.

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MENTORING THE NEXT GENERATION OF BIOBANKERS

Authors: Sheila O'Donoghue, Tamsin Tarling, Kristina Hill

Biobanks and repositories wishing to adapt to national or international standards and seek education materials to improve their operations had few resources until ISBER was established. Historically a new staff member in a biorepository was trained by the senior researcher or technician of the same repository. The first English edition of the ISBER Best Practices in 2005 provided much needed guidance to our community. Subsequent updated versions of the Best Practices were aligned with evolving technological, operational and ethical, legal and societal issues (ELSI). Translation of the 4th edition (2018) of the ISBER Best Practices into multiple languages significantly increased the reach and potential impact of this guidance document.

In the past 10 years, several biobank focused education programs were developed. These range from short (1-10 hour) workshops offered as stand-alone courses by industry or academics or included as part of a biobanking meeting, introductory level courses focused on biobank technicians to two-year graduate programs intended for biobank managers and leaders. Records of completion of these courses range from certificate of attendance to Masters Degrees. Biobank education courses are available online and in face-to-face settings with most courses offered in English. ISBER is currently working with the American Society for Clinical Pathology (ASCP) to develop the first internationally recognized qualification examination for biobank technicians. ISBER also offers the online CTRNet Introduction to Biobanking Course to biobankers in low and middle-income countries at reduced or no fee through the International Agency for Research on Cancer and the Biobank and Cohort Building Network.

Looking to the future, ISBER plans on developing a webinar series based on the 4th edition of the Best Practices. Presenting the Best Practices in a webinar format will make it easier for users to focus in on specific sections or topic areas to suit their specific needs, also ensuring that the biorepository community has the most up-to-date information. In addition, a webinar series on veterinary biobanking was created with input from ISBER and non-ISBER members. This filled a void in this area since existing education is mostly focused on human biobanking. A "toolkit" will also be developed and listed or list of website links to biorepository Standard Operating Procedures (SOPs) that will add to the already existing list of educational biobanking videos and opportunities referenced above.

Public education for biorepositories is another area ISBER will continue to work on diligently. With the already existing task force and working group made up of expert individuals, materials will be created and referenced for the ISBER and non-ISBER community. Biobankers can edit or tailor a range of educational materials for their own public communication needs with the goal of being able to engage their public about biobanking. Since the public is so integral to biobanks this is a very important area of education that ISBER is making a priority in the coming years.

USHERING IN THE NEXT GENERATION OF BIOBANKING

Authors: Rohit Gupta, Sofia Spyrou

The futures of biospecimen research and its direct impact on society will depend on how we as biobankers modernize scientific infrastructure. While there are many areas that require the attention of biobank experts, regenerative medicine and knowledge networks stand out as examples where opportunity lies to transform the perception that biobanks are simply freezer farms. Biobankers have a role in guiding standards and policy that support both downstream scientific applications and also foster inclusion of all populations. As we adapt to the dynamic utility of biospecimens and data, biobanks can help build a bridge towards a better tomorrow.

Living Biobanks

Imagine for a moment that isolated tumor cells from a patient are regrown in a petri dish. Imagine treating the regrown tumor in the dish with a variety of different drugs to help us evaluate responses to treatment without having to expose the patient to potential, unknown side effects. Imagine doing this for all type of cancers and even using this model to study non-cancer diseases and biological processes. Life scientists are now able to take biospecimens from an organism, induce molecular changes to generate stem cells, which can then be treated to develop three-dimensional colonies of cells, or 'organoids,' representing a part of the original organism. Organoid research is an example of how 'living biobanks' are changing the landscape for predicting drug response and identifying novel treatments. So how do we as biobankers support organoid research and regenerative medicine in general? One example is the UK Stem Cell Bank (operated under National Institute for Biological Standards and Control), which has established a pipeline for generating and maintaining stem cell lines under GMP-compliant conditions, inclusive of validated quality control testing. The inception of this central facility places biobankers in a space that can directly impact both research and patient outcomes. The biomaterial can be requested and distributed globally for research activities, such as organoid synthesis, or into GMP-manufacturing facilities for cell therapy development. Ensuring the quality of the sourced cell lines is paramount and provides biobanks an opportunity to help standardize methods, cold-chain technologies, and logistics critical to the success of regenerative medicine.

Knowledge Network

The purpose of a library is to provide an archive of accessible knowledge, which fosters curiosity, questions, and ultimately innovation. Analogous to libraries, the specimens in a biobank contain data relevant to an organism. Modern biobanks have been defined as all collectable specimens and associated data; in order to accelerate bench side discoveries that translate into bedside application, biobanks are well-positioned to serve as both the sample and data stewards. By characterizing specimens with both their clinical and trans-omic biological profiles, researchers can feel as-if they have the most robust biobank in their back pocket. That said, if biobanks are meant to help accelerate access to quality specimens, then why does the research community lack the virtual tools to integrate, interrogate, and share de-identified data related to their silo of samples. As demonstrated through social media models, when an individual is presented with a mechanism that enables them to decide what and how much data to share, they become increasingly comfortable with sharing their information. In order for biobanks to be effective at promoting sample utilization and datafication, researchers should be able to rapidly annotate, search, and bring novel compute techniques to all the de-identified data associated with a human specimen. By disseminating a common, distributed data model across individual biobanks, researchers will be able to collaboratively establish an integrative knowledge network that extends our comprehension into systems biology. When scaled across large populations, aggregating these datasets will improve our diversification of trans-omic data, which will inform the next generation of machine learning models.

Education

Evidence of the earliest biospecimen collections extends back to embalmment and mummification processes, which had significant cultural and religious connotations. Fast forward to present day, advancements in clinical and translational research are embedded in the mainstream media, which has piqued public interest to participate in research. While buzzwords like 'biobank' and 'precision medicine' have become cultural norms, the related messaging has been variable. By considering how an individual may identify racially, socioeconomically, or sexually, biobankers can explore novel ways of improving engagement amongst the diverse community at-large, clinicians, scientists, and lawmakers.

Organoid research and data utilization are examples of the promise of biobanks; however, these areas have opened new ethical and regulatory issues. Unapproved modulation of genetic code and malicious use of data have contributed to a negative impact on research participation. This has caused distrust in the community as to what researchers are doing with the biospecimens and associated data. Much like libraries, biobanks will need to be the nexus between communities and scientists, which includes promoting access to socially sensitive educational resources and fostering debate amongst key stakeholders.

MOVING INTO THE FUTURE: LOOKING BEYOND OUR HORIZONS

Author: Daniel Catchpoole

The growth of ISBER, a society of biorepository managers and tissue handling experts, that has occurred over the last 20 years when like-minded professionals gathered to share, teach and guide each other towards the development of a new discipline called 'biobanking' has been formidable.

Over the past 20 years our society has built a scientific 'ecosystem' that is deep, diverse and touches of a vast array of applications within the wider research landscape. What we do as biobankers impacts our knowledge discovery through academia. The application of that knowledge within our society creates industry opportunities that underpin our growth and maturity. Biobanking engages the people who need and benefit from the knowledge it generates. It starts by engaging our community, touching people who are ill and in need of cures for their disease through biospecimen research. It also takes a wider look at the environment to capture and preserve biospecimens that will provide security in our biodiversity during an uncertain future. In other words, biospecimens contain the 'information' we need to envision, grow, develop and produce a better world through research and science. The vitality of biobanks has emerged and is integral to informatics by providing a direct link between the individual donors/providers of the biospecimen and those that can decipher and interpret the messages the information has to tell them. We can proudly say that ISBER has been the major forum where this growth has been stimulated and nurtured.

So where to now for ISBER? As we look inwards at our society, we see the great achievements made by so many. However, at the risk of becoming myopic and blinkered, we only see the things gained. However, as we prepare for the next 20 years of ISBER, we must look outwards over the horizon of opportunity, so we can envisage a future of leadership, innovation, expansion and consolidation. Comfort is found by looking inward, challenge is gained by looking outward. The opportunities that lie before us will take us on journeys where we encounter new areas of growth, increased opportunity to engage other professional fields and a wider appreciation of the role biobanking has across the research landscape. Potentially we will see things from new perspectives, obtain insights we had not considered whilst developing new relationships with the unexpected. Biobanking will change, and we must ensure it will change for the better. To do so, as the President charged with the task of setting our society on its new course over the horizon, I will draw you back to what 'ISBER' is and how it paves the way for our future. ISBER stands for:

International: ISBER is exemplified as being a 'global' society, learning from a wide range of cultural and societal perspectives that colour our understanding of what matters most as we build and use our biobanks. We need to walk out into that world to become truly 'international' to ensure that ISBER presents a view of biobanking that cuts across all global divides. Whilst it is universally accepted that biospecimens are required to build research initiatives throughout the world, differences in how biobanks are established, managed, funded and appreciated throughout the world differ greatly. ISBER's vision for the future as an international forum should consist of more than expanding our 'network' geographically or increasing the number of biospecimens we handle. Our visions need to move beyond negotiating cross cultural agreements or navigating through international policy positions and power plays. It's about expanding our credibility as the experts who impact biospecimen handling, regulatory negotiations, and standards adherence as an absolutely fundamental practice that benefits us all no matter where we live. ISBER held its 2019 Annual Meeting in China and a Regional meeting in Germany whilst also contributing to a meeting in Qatar. Further engagement occurred with biobankers from Latin America and Africa, across South East Asia, within the India subcontinent as well as 'down under' in Australia and New Zealand. So, whilst ISBER's reputation goes before it across the globe it beholds us to build a worldwide society which is underpinned by common purpose, simple mandates, mutual understanding and united outcomes in research.

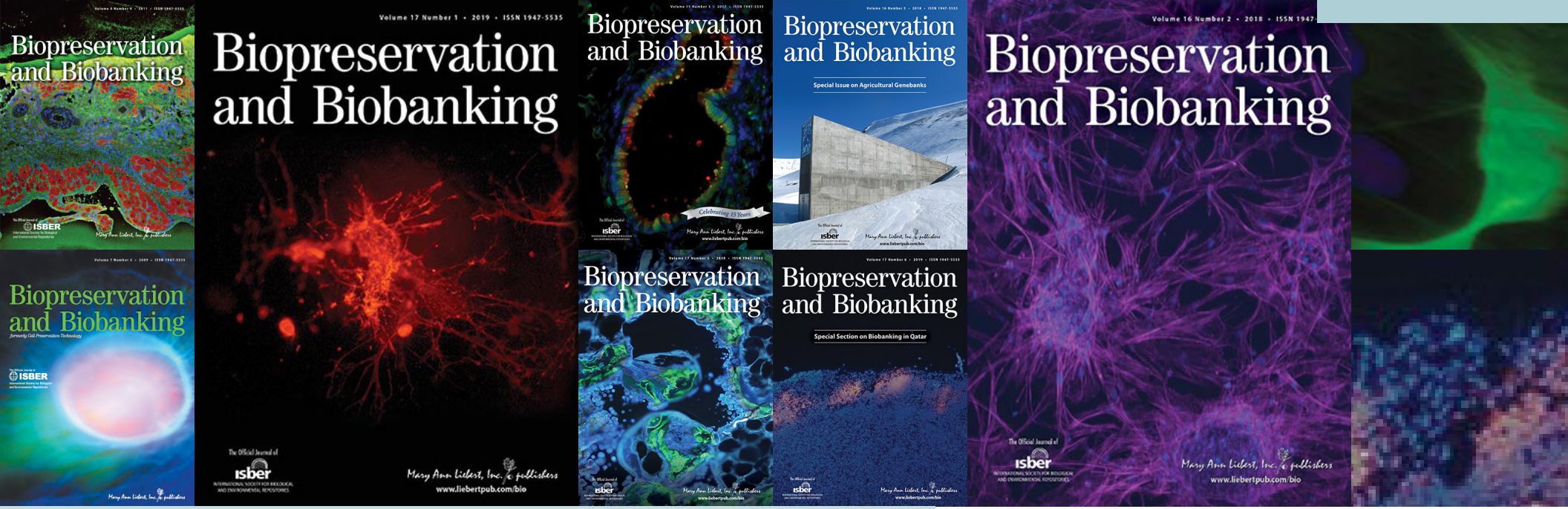
Society: ISBER is a collective of individual professionals with diverse knowledge, opinions, points of view and experiences. A fertile society will allow these individuals to interact, converse, inform, instruct and build each other up in our discipline. One of the key responsibilities for ISBER is to create an environment that allows this collective to engage, create, debate and consider how we should best go about our role as biobankers. Within our future plans, it is key that our society continues to cultivate this environment through innovations that build novel engagements and generates awareness of the

key developments in biobanking. From reaching out to the general public, patients and non-scientific communities, to learning how to walk in the halls of power, influencing our leaders, politicians and policy makers, ISBER has to prepare for a wider level of engagement. As we look outwards, I believe we will observe that the influence biobanking expertise has is far more extensive than initially thought and we will have more professionally to offer in our community. The future growth of our society requires us to prepare this environment for new levels of engagement that welcome in professionals having different experiences that add new 'colours to our palate' and which will hopefully grow our society in wondrous ways.

Biological AND Environmental: If ISBER's future takes us to explore new horizons we should expect that it will lead us to new areas of influence. Biomedical biobanking is accepted as our strength. The impact of biobanking in the environmental and biological fields has likewise been a strong theme. Yet, as we start looking outwards to new horizons, we will find new areas of influence. Already ISBER is engaging with the pharmaceutical industry, the veterinarians, the museum and archivists, as well as new areas of regulatory legal and ethics. We have yet to build links with agribusiness and forestry, the food industry, data analytics specialists, new fields in biotechnology, microbial and fungal systems, reproductive technologies, and chemistry just to name a few, as well as with advocates, reformers, philosophers, policy developers, financial markets, accreditation authorities and educators. Stretching our understanding of biobanking to other fields will cause us to consider biobanking less myopically with the removal of unnecessary restrictions brought about by dogma. The door is open for ISBER to go out and bring new people in.

Repositories: At the core of ISBER's attention are the biorepositories themselves. These facilities should be considered as whole systems that integrate into a wider research and technology ecosystem. So, whilst they must consider the essential human interactions that must take place to make a biobank work, there are also scientific and technical advancements a biobanker must be abreast of. ISBER must be at the cutting edge of freezer and storage technology, biospecimen research and cryobiology science. Our future will see our biospecimen collections become research generating undertakings, not just research responsive facilities. Scientists coming to our biobanks will know that their ideas can be supported by the most robust and evidence-based collection strategies available. Our repositories will hence be positioned within our research institutions as fundamental infrastructure that not only allows researchers to do their job but inspires others to consider new adventurous investigations.

As ISBER looks outwards to it horizons I am confident that our society will find itself impacting in new lands and cultures, building new professionals, gaining momentum in new spheres of professional influence, and leading with new technologies and science. But to do this, we require new leaders; professionals that are inspired by these pursuits, eager to move towards those horizons and to see what is on the other side. At the end of the day, ISBER is about our people. It is the members who inspire and drive discussion, challenge the norm and always seek to advance banking to new heights. This is our future….



BIOPRESERVATION AND BIOBANKING: ISBER'S JOURNAL

Authors: Jim Vaught, Brian Clark, Rongxing Gan

Biopreservation and Biobanking is ISBER's official journal. The journal began publication in May of 2002 as Cell Preservation Technology (CPT) under the editorial leadership of John M. Baust. During that period the journal focused on cryopreservation science, such as the development of optimal methods to stabilize and store cellular materials using natural and commercially developed cryopreservatives. At that time the journal published four issues each year.

As the journal became more closely associated with ISBER and began to publish more biobanking-related articles, it was decided that in order to strengthen the association with ISBER we needed to consider changing the journal's name. During 2008 a small group of journal editors and ISBER members worked with Vicki Cohn, the managing editor in the Mary Ann Liebert publisher's office, to accomplish this goal. The first issue of the journal under the name Biopreservation and Biobanking was published in December, 2008 (Volume 6, Issue 4). At that time the journal's mission statement became "The first journal to provide comprehensive peer-reviewed coverage of biospecimen procurement, processing, preservation and banking, including ethical, legal, and societal considerations."

In 2012, Baust retired as the Editor-in-Chief of the journal. In April 2012 Jim Vaught became the Editor-in-Chief and wrote an introductory editorial, "Transition at Biopreservation and Biobanking." In that editorial he emphasized the journal's commitment to publish a wider variety of articles: "Although biopreservation remains a significant area of emphasis, increasing numbers of papers in general biobanking as well as special reports concerning specific biospecimen research and biobanking networks are also appearing. In addition to the variety of research papers, topics that fall between the technical and ethical/regulatory realms are also appearing, including articles about commercialization of biobanks; managing a biobank network; and managing the introduction of biobanks to potential participants. Again, our journal is in the best position to ad ess these topics that are critical to advancing biobanking as a scientific field in ways that other journals cannot." The April 2012 issue also included publication of the 3rd edition ISBER's Best Practices for Repositories.

One of the important milestones for the journal was its approval for Medline and PubMed indexing in early 2013, after its first application to the National Library of Medicine. Following this approval, the journal has generally experienced significant annual increases in manuscript submissions; full-text downloads and impact factor, as well as an increase in the quality of accepted papers.

Over the past 6 years the journal has continued to publish a wide variety of papers concerning the

technical and ethical/regulatory aspects from the fields of biopreservation and biobanking. Submissions have been received from over 30 countries each year for the past several years. As new approaches and initiatives have emerged, the journal has published a variety of special sections and issues, such as: Biobanking in China: Sustainability in Biobanking; Disaster Recovery; and Standards, Tools and Best Practices for Modern Biobanking. Often, ideas for such special sections and entire issues come from presentations and symposia at ISBER's annual meetings. An example is the Special Issue on Agricultural Genebanks (October, 2018), which will expand the journal's coverage into a new area and hopefully attract additional readership and manuscripts from this important branch of biobanking.

All of the above accomplishments would not have occurred without a strong editorial staff. In addition to the Editor-in-Chief, five Deputy Editors, Marianna Bledsoe, Dayong Gao, Peter Watson, Junmei Zhou (Asian Editor), and William Mathieson (European Editor) serve to coordinate the reviews of manuscripts and recommend revision, acceptance or rejection of papers. A strong editorial board of Section Editors with special expertise, and general board members from all regions of the world all contribute to the journal's success.

And finally, Biopreservation and Biobanking's status as ISBER's official journal contributes to its success and gives ISBER an outlet for publication of its news and scientific initiatives through features such as the ISBER Corner.

TIMELINE

- 2002 ISBER journal titled *Cell Preservation Technology* (CPT), edited by John Baust
- 2003-2008 ISBER journal was published 4 times a year
- 2008 ISBER journal name changes to *Biopreservation and Biobanking*
- December issue published with new name (Vol. 6 Issue 4)
- 2012 Jim Vaught takes over as editor-in-chief
- April issue included the 3rd edition of *ISBER Best Practices*
- 2013 ISBER journal approved of Medline and PubMed indexing after first application to the National Library of Medicine

HISTORY OF THE DEVELOPMENT AND COMMUNITY IMPACT OF THE *ISBER BEST PRACTICES*

Author: Lori Campbell

Repositories must meet the standards of quality and expertise demanded by the international community of scientists and industry for the delivery of materials and information for research purposes. Strategies to achieve quality results and performance improvements often include adherence to established standards and implementation of best practices. While standards represent a rigid set of guidelines that represent a level of quality or excellence that is accepted as the norm, best practices are recommended actions and principles that assert a technique, method, process, or activity that is more effective at delivering a particular outcome. Best practices are intended to serve as a target for the quality management of collections and adoption of best practice elements will vary based on the goals and circumstances of a given initiative and, in some instances, may not be possible to implement or may represent an aspirational achievement.

As the leading global society for biobanking and repository management, ISBER provides a forum for the state-of-the-science policies and processes focused on the collection, handling, storage, and dissemination of biological and environmental information and materials. The organization seeks to promote harmonized quality standards and ethical principles which continue to evolve to reflect developments in biospecimen researchscience and advances in scientific, technological, and laboratory practices. These efforts are supported by the development of best practices that provide a comprehensive tool to guide repository professionals in both managerial and technical aspects of repository governance and operation; regulatory compliance; and the ethical, legal, and social issues relevant to repositories.

In 2005, ISBER published Best Practices for Repositories I: Collection, Storage, and Retrieval of Human Biological Materials for Research to provide guidance for the evaluation and optimization of existing repository practices, development of new procedures, and performance of administrative oversight. Topics covered in the document included repository development considerations; physical facility management aspects such as security, emergency preparedness, and storage equipment; specimen packaging and shipping requirements; quality management including Standard Operating Procedures development and maintenance; general safety issues and regulations; training programs, documentation, and records; specimen collection considerations; and legal and ethical issues for collection of human biospecimens. ISBER Best Practices were subsequently revised in 2008 to include considerations and policies for specimens of non-human origin. The third edition was published in 2012 and reflected advances in biospecimen science and new technology platforms. Building on the foundation of the previous versions, the fourth edition of ISBER Best Practices was released in 2018 and included new areas of interest to the biobanking community, expanded and updated existing topics, and presented an international perspective reflective of the growing diversity of ISBER membership. An addendum to the ISBER Best Practices 4th edition was developed in 2019 to address the growing need for best practices focused on cryogenic preservation and storage of biological and environmental specimens for research and clinical use.

Each version of the ISBER Best Practices was developed under the guidance of an Editorial Board consisting of an Editor-in-Chief and Associate Editors selected to represent the diverse knowledge and experience of the ISBER community. Editors worked with contributors and members of ISBER Working Groups and Special Interest Groups to develop drafts for review and approval by Expert Review Boards and the ISBER Board of Directors. Throughout the process, the Editorial Board sought guidance on the establishment of standardized terminology and definitions for use by the global biobanking community and solicited feedback critical to address areas of commonality among all repositories. Adherence to the recommended "Best Practices" is not always possible and repositories should determine how best to incorporate guidelines in given circumstances and continuously strive for responsible custodianship of collected specimens and data.

The ISBER Best Practices play a key role as a valuable reference for new and established repositories in the development and implementation of standardized practices and for ensuring the provision of specimens of reliable and consistent quality. This commitment to maintaining current and scientifically accurate practices is reinforced by continuing efforts to include input from stakeholders.

THE SOCIETY'S ANNUAL MEETINGS

Author: Marianne Henderson

In 1999, Jim Vaught came back from a local discussion focusing on starting a group on sharing and eventually harmonizing the practices occurring within biorepositories. One of the outcomes of that discussion was to sponsor a meeting that brought together people that collected, processed, stored and used biospecimens from biomedical and environmental research studies. Early in the process, it was agreed that the vendors amongst the ISBER members contribute as much as the scientists and repository staff. Thus, there was always the presence of vendor presentations and exhibit halls in the Annual Meeting & Exhibit plans.

In the first decade of ISBER, the President-Elect was responsible to be the Chair of the next Annual Meeting's program with the committee members being nominated by the ISBER leadership. As the role of the Program Chair has grown, co-Chairs are chosen as the leaders of Annual Meetings. The selection of co-Chairs and program committee members is often the way that ISBER members are initiated into the volunteer leadership roles for the future of the society. ISBER truly became an International meeting, when it was first held in Perugia in October 2004 and then Singapore in 2007. In 2015, the ISBER Board adopted a Regional strategy and this policy resulted in the addition of Regional meetings to the ISBER presence. These Regional meetings are designed to support repository discussions across the world, in locations where and when the Annual Meeting may not reach our global community.

Author: Cheryl Michels

Looking back on my long relationship with ISBER, I have worked with so many wonderful members to help build the society into an influential voice for biospecimen research. As I reflect, a pivotal moment in the history of the Society stands out to me: the inclusion of vendors like myself as full members of the Society. Working closely with the Board of Directors, a small group of vendors began to craft membership language that would allow vendors to become voting members of the Society. The Board understood that these subject experts were fully committed to the science of biobanking and the successful operation of repositories. It is hard to imagine ISBER today without the active participation of so many vendors, solutions providers, private consultants, and supporting organizations.

This spirit of cooperation for the good of the science and the society members has been the keystone principle of the growth and development of the Informatics Working Group. While the group has been led and populated in large part by software vendors, our focus and goal has always been to do our best to provide a neutral environment to provide knowledge and expertise and best practices in the vital work of linking data to specimens. It has been an honor to work with other vendors and informatics specialists, especially Kevin Meagher, to assist in the development of best practices, while providing direction to members who come to our workshops seeking data management solutions.

2000

ISBER's 1st President
Elaine Gunter

ISBER formally charted in 2000 at an ancillary segment of an NCI-sponsored specimen banking workshop, NCI Biorepository & Bioprocessing Workshop, in Rockville, MD. Sandra Wolman served as the administrative officer and mentor at UAREP, our first FASEB-member sponsor organization. Elaine Gunter is recognized as ISBER's first society president.

2001	ISBER 2nd Annual Meeting	MAY 7-8, 2001 • ATLANTA, GA
Theme: Focusing on Shipping, Human Subjects & IRB Issues	179 MEETING ATTENDEES	30 VENDORS

Chart-MVE and Gentra Systems supported this meeting, which was the first official stand-alone meeting. A group tour was done of the CASPIR Repository.

2001 – 2002

ISBER's 2nd & 16th President
Jim Vaught

In 1999, Jim Vaught, came back from a local discussion focusing on starting a group on sharing and eventually harmonizing the practices occurring within biorepositories. One of the outcomes of the discussion was to sponsor a meeting that brought together people that collected, processed, stored and used biospecimens from biomedical and environmental research studies. Through hardwork and collaboration, Jim and the other ISBER founders created ISBER. Many years later, Jim became the editor-in-chief of ISBER's journal Biopreservation and Biobanking and became ISBER's 16th president.

Jim's organizational skills were used to plan the next meeting in Danvers, MA with a field trip to the New England Aquarium and all abstracts published in *Biotechnic & Histochemistry*. While Jim was president, the ISBER team exhaustively searched the web and through personal networking to reach out and invite new biorepository resources such as museums, cell culture organizations and seed banks to join ISBER. Also, under Jim's leadership:

- ISBER's website was expanded and updated
- a society budget was established and the Associates Advisory Board was created to enhance the involvement of commercial vendor members
- the creation of a task force to discuss repository accreditation was developed which eventually evolved into early discussions of ISBER Best Practices
- Relationship established with American Society of Investigative Pathology (ASIP)
- Elaine Gunter was elected as ISBER's archivist

2002

ISBER 3rd Annual Meeting

MAY 5-8, 2002 • DANVERS, MA

Theme: Focusing on Quality Control

316 MEETING ATTENDEES

29 VENDORS

2002-2003

ISBER's 3rd President
Roger Aamodt

40+ INDIVIDUAL MEMBERS

60 ORGANIZATIONAL MEMBERS

Roger Aamodt focused on increasing ISBER membership, specifically the international contingent. Aware that many of the issues that affects human specimen collections also applies to environmental specimens, seed banks and museum collections, Roger made every attempt to reach out to organizations and individuals who are knowledgeable about these issues. Not only did Roger suggest to establish the relationship with ASIP but he is also responsible for drafting the first set of ISBER bylaws and driving the efforts of developing "best practices" rather than repository standards and is credited for publishing the largest number of ISBER newsletter issues (4) in his tenure. During Roger's presidency, ISBER:

- Created a number of small subcommittees to begin contributing and reviewing existing protocols to develop the *ISBER Best Practices for Human Specimen Resources in Support of Research*
- Began planning the first international meeting in Perugia, Italy which took place in 2004
- Shifted the focus of ISBER meetings from human biorepositories to include a more wider group of repositories
- Moved ISBER management from UAREP to ASIP
- Published four ISBER newsletters on ISBER website as well as print
- Created the Director of Services Survey for ISBER website to allow ISBER vendors and associates the opportunity to provide a listing of their services and capabilities
- Extended voting privileges to individual members
- Creation of Associates Advisory Board to enhance involvement of commercial vendor members
- Bylaws were written
- ISBER's journal developed and titled *Cell Preservation Technology* under the editorial leadership of John M. Baust

2003	ISBER 4th Annual Meeting	MAY 4-7, 2003 • PHILADELPHIA, PA
Theme: Biodiversity & International Regulations		239 MEETING ATTENDEES

2003-2004

ISBER's 4th President
Robert Hanner

70 INDIVIDUAL MEMBERS

102 ORGANIZATIONAL MEMBERS

Robert Hanner attend the first ISBER meeting and used the information he gained to work with Chart-MVE to create the Ambrose Monell Collection for Molecular and Microbial Research & Cryogenic Repository at the American Museum of Natural History in New York City. Robert brought his expertise in natural history collections to his presidency and helped to expand ISBER's natural history connections. The 4th Annual Meeting was planned in conjunction with the 19th Annual Meeting of the Society for the Preservation of Natural History Collections (SPNHC) and focused on Repository Design and Data Management. Under Robert's leadership, ISBER:

- Developed a 5-year strategic plan for the society
- Began negotiations for ISBER to become a semi-autonomous division member of ASIP
- Held a symposium on the role of repositories in countering bioterrorism at the annual Experimental Biology meeting
- Reached out to microbiological culture, plant, animal and human reproductive repositories
- Created links with SPNHC, the American Association of Tissue Banks (AATB) and Laboratory Robotics Information Group (LRIG)
- Created new committees to deal with membership issues, education and training.

2004	ISBER 5th Annual Meeting	MAY 11-14, 2004 • NEW YORK, NY
Theme: Repository Design & Data Management		250 MEETING ATTENDEES

2004	1st International Meeting	OCT 17, 2004 • PERUGIA, ITALY
	Theme: Biorepositories in Clinical & Basic Research	250 MEETING ATTENDEES

2004	Special ISBER Symposium	APRIL 17-21, 2004 • WASHINGTON D.C. @ ASIP
	Theme: Safe Specimen Repositories in the ERA of Bioterrorism	

2004-2005

ISBER's 5th President
Ted Mifflin

Ted Mifflin came from the University of Virginia and the Laboratory Robotics Information Group, was involved in many laboratory and repository automation presentations and brought many contacts to ISBER. With Ted's leadership, ISBER:

- Held its first international meeting in Perugia, Italy
- Secured ISBER's journal affiliation with *Cell Preservation Technology*
- Completed and published first edition of *ISBER Best Practices* in *Cell Preservation Technology*
- Expanded the ISBER website
- Created the Associates Council

2005	ISBER 6th Annual Meeting	MAY 1-4, 2005 • SEATTLE, WA
	Theme: Environmental Issues and Repositories	215 MEETING ATTENDEES

2005-2006

86 INDIVIDUAL MEMBERS

106 ORGANIZATIONAL MEMBERS

ISBER's 6th President
William Grizzle

William (Bill) Grizzle is a pathologist at the University of Alabama at Birmingham was an ISBER stalwart giving many presentations on lab and repository safety as well as setting up tissue repositories and was a major contributor to the Best Practices documents. Bill's hands on tissue experiences brought invaluable perspective to ISBER.

Teaming with Marianna Bledsoe, Bill presented at the African Organization for Research and Training in Cancer (AORTIC) in Dakar, Senegal to open a dialogue on human tissue resources in a third world country. During his time as President, Bill:

- Worked diligently to ensure ISBER's financial stability
- Developed ISBER's first strategic plan
- Presented at the International Environmental Specimen Banking Symposium (IEBS)

2006

ISBER 7th Annual Meeting

APRIL 30 - MAY 3, 2006 • BETHESDA, MD

Theme: The Repository of the Future

215 MEETING ATTENDEES

2006-2007

ISBER's 7th President
Frank Simione

100 INDIVIDUAL MEMBERS

100 ORGANIZATIONAL MEMBERS

Frank Simione spent his career at the American Type Culture Collection (ATCC) and brought the microbial collection perspective to ISBER. From ISBER's inception in 1999, Frank quietly and effectively worked behind the scenes to make things happen for the society. In addition to working at ATCC, Frank was also a welcome presence at CDC's CASPIR Repository. As president, Frank led ISBER to:

- Initiate the Corporate Partners program
- Complete the 2nd edition of Best Practices
- Improved the financial management and stability of ISBER
- Continued to develop an ISBER strategic plan

2007

ISBER 8th Annual Meeting

APRIL 28 - MAY 2, 2007 • SINGAPORE

Theme: HCS Workshop: Tissue Fixation for Molecular Analysis in Pathology & Cell Biology

263 MEETING ATTENDEES

2007-2008

106 INDIVIDUAL MEMBERS

109 ORGANIZATIONAL MEMBERS

ISBER's 8th President
Marianna Bledsoe

Under Marianna Bledsoe's leadership, ISBER made a number of important strides towards our goal of promoting excellence in biobanking internationally, and also initiated some new efforts to ensure that the society is responsive to the needs of its members including:

- Completing the Strategic Plan, obtaining comments via ISBER website and presenting to the membership at the 2008 Annual Meeting
- Initiating changes to help expand ISBER's reach internationally.
- Restructuring and expanding the ISBER Marketing Committee with greater international representation to promote the society with the completion of a members survey to better assess their needs.
- Creating the Global Expansion Fund designed to increase ISBER membership and presence world-wide by supporting additional marketing and outreach efforts, annual and/or satellite meetings, workshops or symposia outside the US
- Establishing of an ISBER Awards program to recognize ISBER members for their contributions to the society
- Creating the ISBER Travel award to provide travel funds for individuals in a developing country to attend the ISBER Annual Meeting
- ISBER Special Service Award created
- Publishing the 2nd edition of *Best Practices for Repositories: Collection, Storage, Retrieval and Distribution of Biological Materials for Research*
- Revising the Operating Procedures and Member Privileges
- Launching the ISBER Working Groups
- ISBER journal name changed to *Biopreservation & Biobanking*

2008

ISBER 9th Annual Meeting

MAY 2008 • BETHESDA, MD

Theme: Global Biobanking Collaborations: Challenges & Opportunities

400 MEETING ATTENDEES

2008-2009

140 INDIVIDUAL MEMBERS | 131 ORGANIZATIONAL MEMBERS | 24 COUNTRIES REPRESENTED

ISBER's 9th President
Robert Hewitt

Robert Hewitt was both our ninth and first international president (originally from England, he has lived in both Singapore and France for a number of years).

Robert was the primary organizer for the successful Singapore ISBER Meeting, and worked very effectively with the Council and ISBER Working Groups to organize the meeting.

Robert described ISBER as a Division of the American Society for Investigative Pathology (ASIP), and a thriving, truly international organization. Robert's leadership led to ISBER defining two main new aims 1) expand in non-human biobanking areas and 2) expand in Asia. The first partnership with the KNRRC was established.

With Robert as president, ISBER:

- Became a founding member of the Forum for International Biobanking Organizations (FIBO)
- Created the Publications Committee and Long Range Planning Committee
- Established an Asian chapter
- Increased the number of corporate partners and their sponsorship dollar levels

2009

ISBER 10th Annual Meeting

MAY 2009 • PORTLAND, OR

Theme: ISBER, Celebrating a Decade of Growth & Development in International Biorepository Excellence

407 MEETING ATTENDEES | 48 VENDORS

2009-2010

204 INDIVIDUAL MEMBERS | 154 ORGANIZATIONAL MEMBERS | 30 COUNTRIES REPRESENTED

ISBER's 10th President
Peter HJ Riegman

Peter Riegman is the director of the Erasmus MC Tissue Bank and advisor to the Erasmus MC Central Biobank in the Department of Pathology at Erasmus Medical College in Rotterdam, The Netherlands. In addition to developing a very successful biobank, he has been involved with the development of biobanking policies and initiatives such as the SPIDIA-4P currently in ISO development as well as CEN technical standards for the pre-analytical phase of sample collection for diagnostics and medical research. Peter became ISBER's second international president.

Peter's presidency year culminated at the ISBER annual meeting in Rotterdam, which was the third international meeting organized for ISBER. It was at the 2010 meeting, ISBER sanctioned the informal policy to have a three year cycle of meeting sites with the first two years in North America and the third year internationally. This fulfilled a need for European ISBER members and biobankers as a whole to have more European activity. The need for and interest in a European meeting was so high that it lead to the idea of forming a European biobanking society, called ESBB. During his tenure, there was a more rigorous organization of the ISBER working groups, special interest groups (SIGs) and Committee structure.

- The meeting sanctioned the informal ISBER policy that was to have a three-year cycle of meeting sites; two in North America and the third year internationally.
- Non-Human Specimens Working Group established to bring in more banks working with animal, seed banks, natural history museums, environmental specimen banks, etc.
- Biorepository Self-Assessment Tool launched
- Launched ISBER Pharma WG

2010

ISBER 11th Annual Meeting

MAY 2010 • ROTTERDAM, NETHERLANDS

Theme: Diversity in Biobanking: Embracing Differences, Harnessing Commonalities

383 MEETING ATTENDEES | 57 VENDORS

2010-2011

ISBER's 11th President
Scott Jewell

237 INDIVIDUAL MEMBERS | 207 ORGANIZATIONAL MEMBERS | 30 COUNTRIES REPRESENTED

Scott Jewell is the Deputy Director of the Core Technologies and Services and the Director of the Pathology and Biorepository Core at the Van Andel Research Institute in Grand Rapids, Michigan.

During his tenure, the Society was growing substantially and there was recognition of a need to develop a more refined approach to the management of ISBER that would provide financial stability through the development of better processes to manage operations and finance.

The ultimate goal was to develop a retained surplus to ensure financial stability into the forseeable future for the society. A second goal was to develop clarity around operational processes. During Scott's presidency, the society discussed and planned expanding the number and diversity of working groups that were meant to advance ISBER's mandate and goals. Efforts were also made to improve the promotion of ISBER. Other major accomplishments during Scott's presidency include:

- Launch of the Informatics Working Group
- Education & Training Committee proposed the Certified Repository Technician program
- Launch of the ISBER New Product Award

2011

ISBER 12th Annual Meeting

MAY 2011 • ARLINGTON, VA

Theme: Impact & Public Benefits of Biorepositories

529 MEETING ATTENDEES

2011-2012

249 INDIVIDUAL MEMBERS | 228 ORGANIZATIONAL MEMBERS | 30 COUNTRIES REPRESENTED

ISBER's 12th President
Marianne K. Henderson

Marianne Henderson is the Senior Advisor on Biobanking, Center for Global Health (CGH) and the Senior Advisor for Division Resources, OD, DCEG at the National Cancer Institute, NIH, DHHS in Bethesda, Maryland.

In her job she facilitates large infrastructure needs for the NCI population sciences research for DCEG, including the 11 million specimen NCI biobank containing specimens from 400+ studies of cancer collected globally.

During her tenure, the 3rd Edition of *ISBER Best Practices* was published and ISBER Council developed publication policies and further refined the ISBER Newsletter and ISBER Corner articles. The Strategic Planning Committee designed a system to improve communication between ISBER leadership and ASIP staff, revised the guidelines for Regional Chapter formation, worked with ESBB to develop plans to ensure ESBB activities as a separate society were integrated with ISBER activities, and created a new category of ISBER partnerships for geographically located Biobanking Societies as "Affiliates."

ISBER Special Interest Groups (SIGs) continued to grow in number ranging from member interests around automated repositories to rare diseases. During Marianne's past-President term, she started the "Flat ISBER" collection, which encouraged members to take pictures of themselves in unusual locations while holding the ISBER logo. As Marianne was rolling off as the past-President term, she was named to be the Chair of the new Organizational Advisory Committee (OAC) that oversees meeting planning.

- The Science Policy Committee became a Standing Committee and participated in the ASIP response to the Common Rule.
- 3rd Edition of *ISBER Best Practices* was published
- Launched a Biorepository Proficiency Test program
- First annual Fun Run/Walk in support of the Global Expansion Fund
- Launch of ISBER corner in BIO

2012

ISBER 13th Annual Meeting

MAY 2012 • VANCOUVER, CANADA

Theme: Keeping Step in an Evolving Global Research Environment: Biobanking for Now & for the Future

528 MEETING ATTENDEES

2012-2013

299 INDIVIDUAL MEMBERS | 243 ORGANIZATIONAL MEMBERS | 30 COUNTRIES REPRESENTED

ISBER's 13th President
Katheryn Shea

Kathi Shea is the Biobank Business Lead at Brooks Life Sciences.

The most significant event during her presidency was the decision to separate from ASIP as the managing platform for ISBER and to become an independent society. For that reason, a lot of time and effort was spent in defining the terms of the new independent organization and doing the due diligence and tender search for a new management company.

The search resulted with a new contract with Malachite Management, which has continued to this day. This was a bold but important step for ISBER, which helped to further its growth as the leading global organization for biobanking.

During this time, the society also planned another international meeting in Sydney, Australia. This came to fruition and was a huge success as there were 472 participants at the meeting. This was an important achievement for ISBER because it solidified our global reach, particularly in the Asia-Pacific region. This was the first year we actively sought participants from China, and we gained a better understanding of the dynamics of the Asia-Pacific region and the role of the Asia-Pacific Region in ISBER.

- ISBER Biorepository Proficiency Testing program was expanded
- College of American Pathologists (CAP) launched its Biorepository Accreditation Program (BAP)
- ANRRC became an official affiliate of ISBER
- OAC was established to support ISBER meeting logistics and planning

2013

ISBER 14th Annual Meeting

MAY 2013 • SYNDEY, AUSTRALIA

Theme: Turning the World Upside Down: Emerging Perspectives on Biorepositories

363 MEETING ATTENDEES

**Deputy Director of NCI's Office of Biorepositories and Biospecimen Research*

2013-2014

310 INDIVIDUAL MEMBERS | 250 ORGANIZATIONAL MEMBERS | 30 COUNTRIES REPRESENTED

ISBER's 14th President
Fay Betsou

Fay was the Chief Scientific Officer of IBBL (Integrated BioBank of Luxembourg) in Luxembourg and is a leading light in biospecimen science and standardization. During her tenure, the new managerial relationship with Malachite was set in place and ISBER firmly established its strategy as a global society with well-defined geographic regions, The Americas, EMEA (Europe, Middle East and Africa), Asia-Pacific, and China. Several Affiliate Agreements were set in place with the Society for Cryobiology, SLAS, PRIM&R, CAP and ANRRC. The Society's journal, Biopreservation and Biobanking reached an impact factor of 1.5.

For the first time at an 2014 annual meeting, there was a joint biospecimen science symposium held with the Society for Cryobiology. The goals that year particularly focused on modifying and maintaining its Bylaws to provide a framework for regional organizations and to preserve regional autonomy while ensuring regional participation in the Society's governance. In addition, the aim was to maintain the Society as a coordinated and cohesive whole and to maintain overall control and protect the integrity of the Society services and brand as it moved into a new era of management as an independent entity.

- ISBER became a 501c3 nonprofit organization and separated itself from ASIP
- ISBER participated in the BBMRI-ERIC inaugural meeting
- ISBER participated in the IARC/BCNet meeting in Lyon
- ISBER regions were defined
- ISBER OAC created to manage annual meeting planning

2014

ISBER 15th Annual Meeting

MAY 2014 • ORLANDO, FL

Theme: Fact Not Fantasy: Evidence Based Biobanking

675 MEETING ATTENDEES

**BSc(Med) MD FRCPC, University of Manitoba/CancerCare Manitoba*

†BSc, PhD, AKC, MBA, FLS, Europe, Middle-East and Africa University College London and Farr Institute of Health Informatics Research, London, UK

2014-2015

336 INDIVIDUAL MEMBERS | 234 ORGANIZATIONAL MEMBERS | 30 COUNTRIES REPRESENTED

ISBER's 15th President
Andy Zaayenga

Andy Zaayenga is the Managing Director of SmarterLab, a consultancy for laboratory automation and business development in drug discovery and biospecimen science. As the 15th president, Andy led a rapidly expanding organization that was developing new and improved tools to enhance its operations and profile in global biobanking. The Regional Charter was implemented which signified that all the regions of the world represented in the Society had equal representation in its governance. The President, in order to underline the Regional Charter, visited many biorepositories across North America, Europe, China, Korea, Japan and Singapore. During this year the ISBER 2014-2017, a Strategic and Operating Plan was developed and included the folloiwng five goals:

- Strategic Direction 1: Establish ISBER as an Integrated Global Society
- Strategic Direction 2: Balance growth and financial stability of the Society
- Strategic Direction 3: Optimize organizational efficiency and effectiveness
- Strategic Direction 4: Identify and develop future leaders
- Strategic Direction 5: Sustain market leadership and position in Biobanking

The society restructured the governance of the Board and Committees to reflect best practices for non-profit associations. This involved revising the Bylaws with new policies and procedures. The society attained tax exempt status under section 501c3 of the USA IRS. ISBER became a liaison organization with the International Organization for Standardization (ISO) through the newly formed ISO Technical Committee: ISO 276 "Biotechnology." *ISBER Best Practices* were translated into simplified Chinese and Korean. Many agreements with other organizations were developed including: IBBL partnership, ESBB Affiliate, IARC MOA for BCNET, ABNA Affiliate agreement, Society for Cryobiology Affiliate agreement, SLAS Agreement, TMF MOU, CTRNet MOU, American Association of Pathologists' Assistants (AAPA) Associate Agreement. China Associate Agreements with BBCR, BBCMBA, SCRC, GlobalMD, and BGI.

All in all, this was a very busy year that firmly set in place ISBER's global orientation and markedly enhanced its scope and collaborations as an independent society.

- A new online ISBER Forum and News Blog were initiated.
- STANDARD PREANALYTIC CODE (SPRECalc) launched
- CTRNet Basics of Biobanking Online Education Program: External Quality Assessment Survey launched
- International Repository Locator (IRL) Database initiated
- ISO Technical Committee on Biobanking created

2015

ISBER 16th Annual Meeting

MAY 5 – 19, 2015 • PHOENIX, AZ

Theme: Bridging the Canyon - Connecting Biobank Communities through Innovations in Global Health, Research & Environmental Preservation

773 MEETING ATTENDEES

2015-2016

290 INDIVIDUAL MEMBERS

265 ORGANIZATIONAL MEMBERS

30 COUNTRIES REPRESENTED

ISBER's 16th President
Jim Vaught*

Jim Vaught currently serves as the Editor-in-Chief of Biopreservation and Biobanking, is a Consultant and is a Guest Professor at Central South University in Changsha, China.

As our sixteenth president, Jim holds the unique distinction of being the only President who has served twice. During his time in office, there were several new initiatives including a conversation started with AABB that resulted thus far in a joint initiative to define the interests of the ISBER membership in ISBER Standards based on *ISBER Best Practices*. The development of the 4th Edition of *ISBER Best Practices* was set in motion with the selection of its editor and a work plan and timeline was created.

Discussions were initiated about the creation of a Global Biobanking Conference with representatives from ESBB and BBMRI. An ISBER Task Force was created in order to have ISBER members actively work with the ISO276 Working Group to create a global Standard for Biobanking. The World Medical Association Declaration on Ethical Issues Related to Health Databases and Biobanks was reviewed and commented upon by an active Science Policy Committee. Jim was invited to speak about ISBER initiatives and to represent ISBER at the BBMRI meeting in Milan, the Annual Biobank China meeting in Shanghai, a genomics conference in Saudi Arabia, and the BBCMBA meeting in Shanghai.

ISBER began development of a Best Practices Training Initiative through the Education and Training Committee. Jim also worked with Conversant Bio on a collaborative grant with ISBER concerning biobank sustainability. ISBER members reviewed the proposals and Conversant supplied the funding. Efforts were also made to define the benefits of gold and platinum sponsorship and beginning in-person meetings between the Board and Platinum sponsors during our annual meeting to improve relations with major sponsors.

2016

ISBER 17th Annual Meeting

APRIL 5-8, 2016 BERLIN, GERMANY

Theme: Breaking Down Walls: Unifying Biobanking Communities to Secure Our Sustainability

571 MEETING ATTENDEES

2016-2017

346 INDIVIDUAL MEMBERS

256 ORGANIZATIONAL MEMBERS

ISBER's 17th President
Brent Schacter*

At the time of his presidency, our 17th President, Brent Schacter, was a professor in the Department of Internal Medicine, University of Manitoba and a member of the Department of Hematology and Medical Oncology at CancerCare Manitoba in Winnipeg, Canada. He is an academic hematologist who was the PI for the CTRNet initiative and is on the ISO 276 Working Group to create ISO20387, the global standard for biobanking and ISO 22758. During Brent's presidency:

- ISBER developed the new strategic plan
- The Standards, Membership, Marketing and Communications Committees were created to support the needs of the membership
- A new focus on an intention to develop standards and related materials

- Re-affirmation of a commitment to ISBER's global strategy and the development of five new strategic directions were developed:
  1. Strengthen the organization by optimizing ISBER's organizational structure and leveraging our strengths through communication plans, marketing plans and membership drives
  2. Influence policy by providing leadership and advocacy on key issues such as harmonization, legislation, best practices and standards
  3. Advance the science of biobanking to drive innovation in the industry
  4. Global and sectoral presence in order to increase its profile internationally, throughout the regions, within underrepresented sectors such as enviro-bio and pharma and amongst our partners
  5. Increased awareness of ISBER through development of public education, communication plans, marketing

2017

ISBER 18th Annual Meeting

MAY 9-12, 2017 •TORONTO, CANADA

Theme: Due North: Aligning Biobanking Practice with Evolving Evidence and Innovation

700 MEETING ATTENDEES

2017-2018

412 INDIVIDUAL MEMBERS

261 ORGANIZATIONAL MEMBERS

ISBER's 18th President
Zisis Kozlakidis†

Zisis Kozlakidis is Faculty at Cass Business School, City University of London and St George's Medical School, London as well as Head of the Laboratory Services and Biobanking for the International Agency for Research on Cancer (IARC) in Lyon, France. IARC is a specialised Agency of the World Health Organization (WHO) whose biobank contains over 7 million samples from studies across the world and collected for more than four decades. With Zisis as president:

- ISBER published its 4th Edition of *Best Practices* and initiated and supported the translation of it into a number of languages beyond English, befitting ISBER's global scope.
- Continuing the collaboration with ISO, ISO 20387, the global standard in Biobanking was published.
- ISBER held its first Biospecimen Research Symposium in Luxembourg in collaboration with the Integrated Biobank of Luxembourg (IBBL) and supported by the *Fonds National de la Recherche Luxembourg*.
- Several new affiliate agreements were concluded globally with BBCMBA and CNGB in China, CIBER in Japan and with NBS in Russia.
- The ISBER Board began a formal Regional Ambassadors Program and charged Regional Directors at Large on the Board to form their supporting teams to enhance membership and diffusion of ISBER tools and products.
- A Technician Qualification Program in association with ASCP-BOC (American Society of Clinical Pathology – Board of Certification) development began in December of 2018 after the open invitation and selection of the Exam Committee.

2018	ISBER 19th Annual Meeting	MAY 20 – 24, 2018 • DALLAS, TX
	Theme: Thinking Big: Seizing Big Opportunities in Biobanking Through Data, Collaboration & Innovation	675 MEETING ATTENDEES

2018-2019

ISBER's 19th President
David Lewandowski

Dave Lewandowski from Brooks Life Sciences served as ISBER's 19th elected president. His role with Brooks allowed him to work with leading life science research, manufacturing and healthcare facilities globally, specifically targeting facilities who are implementing systems to support current and future growth in their biobanking related activities. David enjoyed the opportunity to highlight ISBER's valuable role to share tools and best practices, which supports new research in emerging fields of personalized medicine and adoptive therapies. As tools and capabilities become more precise, biobanks will be required to be adaptable, scalable and implement repeatable processes.

As president, David and ISBER members executed the following key activities, positioning ISBER for success today and in the future:

- The new ISO 20387 biobanking accreditation was finalized and published. The Cornell Veterinary biobank in Ithaca, NY, led by Marta Castelhano, was the first biobank to achieve accredited status.
- *The LN2 Cryogenic Storage Facility Best Practices Addendum,* was developed and published with the help and co-sponsorship from the Society for Cryobiology.
- The second Biospecimen Research Symposium, Focus on Quality and Standards, was held in Berlin Germany, February 5-6, 2019. This specialized meeting brought some of the top scientists in the world together to discuss the intricacies and lessons for producing and utilizing top quality biospecimens.
- The website redesign initiative was launched and led by the ISBER Head Office and Catherine Seiler. The initiative included an RFP requesting a review of the current website, a proposed vision for the future site and a budget estimate.
- Execution of ISBER's first ever biobank meeting in Shanghai, China
- Regional Ambassadors identified for all Regions and announced at the Annual Meeting
- Meetings with Society for Cryobiology to discuss future collaborating opportunities with up to and including additional jointly produced products and shared meetings.

Anecdote

During the meeting in Shanghai, ISBER demonstrated their full commitment to representing all regions of the globe. ISBER was fortunate to have many great local partners who supported the meeting in countless ways – even returning a passport lost by a Polish meeting attendee.

2019 ISBER 20th Annual Meeting

MAY 7-10, 2019 • SHANGHAI, CHINA

Honoring Our Past, Celebrating the Present & Envisioning Our Future

738 MEETING ATTENDEES 46 VENDORS

2019-2020

ISBER's 20th President
Debra Leiolani Garcia

Deb Leiolani Garcia is recently retired as the Operations Director of the AIDS and Cancer Specimen Resource (ACSR) and now works as an independent consultant. She has been an active member of the International Society for Biological and Environmental Repositories (ISBER) for the past 20 years and recently served as ISBER's 20th president. She has also served as the Committee Chair of the Education and Training Committee's Certified Repository Technician (CRT) program and the Membership and Marketing Committee.

Deb served on the 3rd edition of the Best Practices Task Force and has been a strong advocate of ISBER's development of webinars and seminars regarding compliance, legal and ethical issues related to the collection and storage of human biospecimen, audit and training tools for the biobanking community to be shared globally

As president, Deb worked with the ISBER Board of Directors, ISBER Head Office and membership to develop and implement the following activities to maintain and foster global collaboration, create training opportunities, and provide an international showcase for state-of-the-art policies and procedures during the COVID-19 Pandemic. Together, these activities highlight the flexibility of leadership and staff while promoting best practices that cut across the broad range of repositories that ISBER serves. ISBER's continued growth and development is dependent on the on-going engagement of our members.

- COVID-19 Response
  - Understanding COVID-19 Webinar with Dr. Tristin Knight
  - COVID-19 Biobanking Challenges survey lead by the Standards Committee
  - Regional COVID-19 Town Hall Series: Preparedness and Response
    - IPR/China regional
    - Americas/EMEA regional
    - COVID-19 Biobanking Challenges survey
- Educational Opportunities
  - Virtual ISBER 2020 Educational Program Series held in lieu of the 2020 Annual Meeting from May to November 2020.
  - Virtual Corporate Workshops
  - Virtual Contributed Papers
- Virtual Exhibit Hall
  - Opened July 1, 2020
- Governance Review
  - Review and update of ISBER bylaws and policies to ensure they met with current regulatory and industry standards

- Release of Translated Best Practices
  - 4th edition translated in Spanish, Russian, Chinese, Japanese and Korean
  - Release of the Liquid Nitrogen-Based Cryogenic Storage of Specimens addendum to the 4th edition of Best Practices translate into Russian, Chinese and Japanese
- Strategic and Business Planning for 2020-2023
  - Member survey, Stakeholder interviews and Vendor input
- Updated ISBER Website
  - Launched May 2020
- Regional Ambassador Program
  - Regional Ambassadors identified in China, IPR, Americas and EMEA
- Regional Meetings
  - Minneapolis held November 2019
  - New Delhi, India in partnership with the India National Liver Disease Biobank
  - Shenzhen, China in partnership with ABC held November 2019
- Sustain ISBER's Leadership Position in Biobank
  - Provide access to expertise and resources
  - Review and thoughtful critique of changes in regulations affecting biobanking around the world
  - Engage and educate ISBER members and stakeholders about emerging issues that affect biobanking
  - Provide unique opportunities for creating a harmonized global discipline across biobanking related fields

"Coming together is a beginning, staying together is progress, and working together is success."

2020	ISBER 2020 Educational Program Series	MAY - NOVEMBER, 2020
	Virtual, Live, Interactive, Flexible	

2020-2021

ISBER's 21st President
Daniel Catchpoole

Associate Professor Dan Catchpoole is the 21st ISBER President. He is also the first President from Australia, the Indo-Pacific Rim region and indeed, the Southern Hemisphere, demonstrating the global reach being experienced by the society.

In 2001, Dan's biobanking career began when he was appointed Head of The Tumour Bank at The Children's Hospital at Westmead in Sydney, NSW Australia. Early in his career he, along with two other biobankers in Australia, started discussions which were the catalyst for the formation of The Australasian Biospecimens Network Association (ABNA), one of ISBER's long serving affiliates.

Dan commenced his involvement with ISBER by being approved to lead the Hospital Integrated Biobank Special Interest Group. He was also one of the founding participants in the Pediatric Biobanking Special Interest Group, which has combined to release papers and a special edition of Biopreservation and Biobanking focussing on biobanking for children-specific diseases. Dan was elected ISBER's 2nd Director-At-Large for the Indo-Pacific Rim in 2017 prior to being elected President in 2019.

During Dan's time as President, ISBER achieved the following:

- Lead ISBER through the greatest disruption to our organisation the society has faced – the SARS-CoV2 pandemic. This required considerable repositioning of ISBER's activities, loss of in-person meetings, the renegotiation of contracts and a rapid deployment of virtual programs of education and member engagement.
- Despite the disruption to our regular activities and the limitations on time available for ISBER leaders brought about by COVID-19 lockdowns, ISBER was faced with an incredibly busy 12 months. Hence, it was vital that member and leader spirits were kept high, positive, creative and active.
- Following ISBER's initial response to the pandemic, which led to a series of educational webinars addressing the impact of COVID-19 on our biobanks and our subsequence response, Dan (i) brokered the COVID-19 Ready Biobank Directory with BBMRI, (ii) joined forces with the Society for Cryobiology to add a webinar discussing vaccine roll=out and logistics to the educational series, (iii) compiled a joint response from ISBER members and vendors on the logistics of managing a -80C cold chain, necessary for the distribution of some of the COVID-19 vaccines.
- Oversaw the establishment and successful uptake of the "Roadmap to Scientific Discovery" ISBER Education Program as an alternative to the 2020 Annual Meeting that was cancelled due the pandemic.
- Oversaw the establishment of the ISBER Best Practices webinar series, organised by the Education and Training Committee.
- Released the ISBER Veterinary Biobank webinar program, a nine part series addressing specific biobanking practices related to animal biospecimens.
- ISBER partnered with the following organisations to hold regional virtual meetings: (i) National Liver Disease Biobank, Delhi, India (February 2020), (ii) University Health Network Biospecimens Services, Toronto, Canada (October 2020), (iii) Qatar Biobank, Doha, Qatar (March 2021).
- Established ISBER's first ever fully-virtual Annual Meeting and Exhibits in place of our usual in-person meeting.
- Oversaw the consolidation of the Qualification in Biorepository Science (QBRS) for biobanking professionals, with 18 members receiving the qualification.
- Underwent a thorough review of the ISBER strategic plan, with the release of a bridging plan that considers changes of practice post-pandemic.
- Introduced the world to Coco!

ISBER AWARDS

ISBER Award for Outstanding Achievement in Biobanking

The ISBER Award for Outstanding Achievement in Biobanking, sponsored by Worthington Industries, is designed to recognize individuals who have made outstanding contributions to the field of biobanking. The award can be given for a single outstanding achievement or a life-time body of outstanding work in the field.

Award Recipients:

- Andrew Brooks (2021)
- Helen M. Moore (2020)
- Marianna J. Bledsoe (2019)
- Jane Carpenter (2018)
- Allison Hubel (2017)
- Rongxing Gan (2016)
- William Grizzle (2015)
- Yeonhee Lee (2014)
- Jim Vaught (2013)
- Robert Hewitt (2012)
- Carolyn Compton (2011)
- Kurt Zatloukal (2010)

ISBER Distinguished Leadership & Service Award

The Distinguished Leadership & Service award is designed to honor ISBER members who have demonstrated exceptional leadership to further the mission and goals of the society and/or significant, long-standing contributions to the society.

Award Recipients:

- Nicole Sieffert (2021)
- Kathi Shea (2020)
- Daniel Simeon-Dubach (2019)
- Lori Campbell (2018)
- Katherine Sexton (2017)
- Cheryl Michels (2016)
- Marianne Henderson (2015)
- Rita Lawlor (2014)
- Fay Betsou (2013)
- Marianna Bledsoe (2012)
- Robert Hewitt (2011)
- Phil Baird (2010)
- Elaine Gunter (2009)

ISBER Special Service Award

The ISBER Special Service Awards recognize individuals who have made exceptional contributions towards the goals of the Society through the performance of a special service or act on behalf of the organization.

Award Recipients:

- Clare Allocca, Karolin Bergenstråhle, Anusha Hettiaratchi, Billy Schleif, Heidi Wagner, Birendra Kumar Yadav (2021)
- Diane McGarvey, Dayong Gao, Marianne Henderson, Brent Schacter, Jason Chen (2020)
- Alison Parry-Jones, Catherine Seiler, Monique Albert, William Mathieson, Xiaoyan Zhang (2019)
- Marianna Bledsoe, Mark Barnes, Helen Morrin, Andrew Brookes, Koh Furuta, Marianne Henderson, Xiaomin Wang, Xuexun Zhou (2018)
- Deb Garcia, Daniel Simeon-Dubach (2017)
- Marianna Bledsoe, Piper Mullins, Nicole Sieffert (2016)
- David Lewandowski, Tim Shi, Rick Michels, Koh Furuta (2015)
- Peter Watson, Brent Schacter (2014)
- Cheryl Michels and Marianne Henderson, Scott Jewell, Marianna Bledsoe, Fay Betsou, Brent Schacter, Heather Siefers, Andy Zaayenga (ISBER Transition Task Force) (2013)
- Cheryl Michels, Nicole Sieffert, and Andy Zaayenga (2012)
- Fay Betsou, Lori Campbell, Debra Garcia, Judith Giri, Karen Pitt, Rebecca Pugh, Katherine Sexton,
- Amy Skubitz, Stella Somiari (2011)
- Chon Boon Eng, Andy Zaayenga (2010)
- Fay Betsou, Katherine Sexton (2009)
- Karen Pitt, Amy Skubitz, Katherine Sexton, Lori Campbell, Rebecca Pugh, Stella Somiari (2008)

ISBER Pioneer's Award

The ISBER Pioneer's Award, sponsored by MVE, recognizes individuals who have provided outstanding leadership to the founding, support and incorporation of ISBER as an international biobanking society. This Award was previously named the "ISBER Founder's Award".

Award Recipients:

- Fay Betsou (2021)
- Frank Simione (2020)
- William E. Grizzle (2019)
- Jim Vaught (2018)
- Phil Baird (2017)
- Sandy Wolman (2016)
- Elaine Gunter (2015)

ISBER Travel Award

The ISBER Travel Award provides travel support for individuals from emerging countries to attend the ISBER Annual Meeting.

Award Recipients:

- Bushra Allah Rakha – Pakistan (2020)
- Ana Piddubna - Ukraine (2019)
- Amany Abou Elfadel - Egypt (2018)
- Birendra Yadav - India
- Jean Marie Nan - Cameroon
- Milcah Dhoro - Zimbabwe
- Rogers Kisuule - Uganda (2017)
- Pleeian Bautista Medina - Phillippines (2016)
- Thaddius Ssempagala - Uganda (2015)
- Sureyah Nassimbwa - Uganda (2014)

ISBER Outstanding New Product Award

To acknowledge the developments and innovation in biobanking, a team of experts from diverse fields select as many as two products to receive the ISBER Outstanding New Product Award at the Annual Meeting.

Award Recipients:

- Hatch Lite Automated Storage Unit by GENEPOINT (2019)
- IntelliXmark by Brooks Life Sciences (2018)
- Chart MVE's Fusion (2017)
- TempAura by Brooks Life Sciences (2016)
- CryoPod Carrier from Biocision (2015)
- DNA Genotek for HEMAgene BUFFY COAT (2014)
- Stirling Ultracold Model SU78OU (2013)
- CryoXtract's CXT 750™ Automated Frozen Sample Aliquotter (2012)
- MVE Chart's MVE Variō™ Series (2011)

EPILOGUE

Author: Zisis Zoklakidis

The history of ISBER is a lesson in how to grow an important idea, quality biobanking, when you have committed leadership and exceptional staff and an interested, experienced and enthusiastic membership who wish to participate and also learn more about how to achieve quality results in a young and rapidly maturing bioscience that is so important for biomedical research and sustainability of the environment. By 2018, there were 396 Individual members as well as 35 large, 63, medium, and 141 small organizations as members, comprising 1017 members in total in 41 countries around the world. At that time there were 715 total members in the Americas, 181 in EMEA, 80 in the IPR and 41 in China. By way of comparison, in 2004 there were 70 individual and 102 institutional members.

Much has been achieved in the past twenty years, but there is still much to be done as ISBER moves forward with strong and supportive management and visionary and thoughtful leadership. ISBER will continue to move from strength to strength and ever increasing achievement into its third decade, as the only global forum that addresses harmonization of scientific, technical, legal and ethical issues relevant to repositories of biological and environmental specimens.

TESTIMONIALS & MEMBER REFLECTIONS

"Looking back on my long relationship with ISBER, I have worked with so many wonderful members to help build the society into an influential voice for biospecimen research. As I reflect, a pivotal moment in the history of the Society stands out to me: the inclusion of vendors like myself as full members of the Society. From its inception, ISBER welcomed vendors to participate in providing much needed funding. However, there was a strong desire to keep vendors from becoming full-fledged voting members, based on an understandable concern that the Society would become commercialized.

Working closely with the Board of Directors, a small group of vendors began to craft membership language that would allow vendors to become voting members of the Society. The Board understood that these subject experts were fully committed to the science of biobanking and the successful operation of repositories. It is hard to imagine ISBER today without the active participation of so many vendors, solutions providers, private consultants, and supporting organizations.

This spirit of cooperation for the good of the science and the society members has been the keystone principle of the growth and development of the Informatics Working Group. While the group has been led and populated in large part by software vendors, our focus and goal has always been to do our best to provide a neutral environment to provide knowledge and expertise and best practices in the vital work of linking data to specimens. It has been an honor to work with other vendors and informatics specialists, especially Kevin Meagher, to assist in the development of best practices, while providing direction to members who come to our workshops seeking data management solutions."
CHERYL MICHAELS

Peter reflected that it was a wonderful time for him to be president (2009-10) and to work with the very best people on the ISBER council. It was a time when it was possible to show that non-USA members were fully capable of taking the lead and to show that it was possible to organize a successful ISBER AGM in Europe. This was an important point of departure for ISBER, because the Executive Management of ISBER through ASIP had been concerned previously about the viability of a European meeting.
PETER HJ RIEGMAN

"Deeply grateful to all the past ISBER presidents who served well and provided great contributions to ISBER, to Eng Bon Choon, to Sandy Wolman who served as our guiding spirit in the early years, and to ISBER staff in the ASIP Office, including Tara Snethen, Alta Wallington, Andrea Jackson, Laurie Menser, Sara Hamilton, and Mark Sobel, who kept ISBER running smoothly. A special thank-you goes to Steve Shaw of Chart-MVE, who has supported us from the beginning. Without his assistance and NCI funding, our very first meeting wouldn't have been possible. In every way, he has been a major contributor in ISBER."
ELAINE GUNTER

"I would like to express my appreciation for all the Presidents denoted in this summary, who have been most gracious in providing time and effort to recollect the highlights and important accomplishments of their tenure in office, from their perspective. I thank Peter Riegman, Scott Jewell, Marianne Henderson, Kathi Shea, Fay Betsou, Andy Zayengaa, Jim Vaught and Zisis Kozlakidis for their assistance. I would also like to commend David Lewandoski, for carrying on the ISBER tradition of growing the society while staying focused on its commitment to advance and promote quality biobanking around the world, and we look forward to Debra Garcia as ISBER President continuing to move forward boldly beyond its 20-year Anniversary. We also greatly appreciate the strong support provided by Ana Torres, our Executive Director and her staff at Malachite Management in Vancouver, Canada."
BRENT SCHACTER

ACRONYMS

AABB	(American Association of Blood Banks)
ABNA	Australasian Biospecimen Network Association
AGM	Annual General Meeting
ANPRM	Advance notice of proposed rulemaking
ANRRC	Asian Network of Research Resource Centers
ASCP-BOC	American Society of Clinical Pathology-Board of Certification
ASIP	American Society for Investigative Pathology
BBCMBA	Biobank Branch, China Medicinal Biotech Association
BBMRI	Biobanking and Biomolecular Resources Research Infrastructure
BCNET	Biobank and Cohort Network
BGI	BGI Group genome sequencing centre, Shenzhen, China
CAP	College of American Pathologists
CEN	European Committee for Standardization
CNGB	China National GeneBank
CIBER	Council for Industrial Use of Biological and Environmental Repositories
CTRNet	Canadian Tissue Repository Network
DCEG	Division of Cancer Epidemiology and Genetics
DHHS	United States Department of Health and Human Services
EMEA	Europe, Middle East and Africa region
ESBB	European, Middle Eastern and African Society for Biopreservation and Biobanking
IARC	International Association for Research in Cancer
IBBL	Integrated Biobank of Luxembourg
IPR	Indo-Pacific Rim region
ISBER	International Society for Biological and Environmental Biorepositories
ISO	International Organization for Standardization
NIH	National Institutes of Health
OD	Office of the Director
PRIM&R	Public Responsibility in Medicine and Research
SLAS	Society for Laboratory Automation and Screening
SPIDIA 4P	Standardization and improvement of genetic pre-analytical tools and procedures for in-vitro diagnostics
TMF	Technologie und Methodenplatform fur die vernetzte medizinische Forschung e,V.

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