



**Environmental
Mutagenesis and
Genomics Society**

Synergistic Interactions for a Better World

Environmental Mutagenesis and Genomics: The Next Fifty Years

TRANSGENICS AND IN VIVO MUTAGENESIS

MOLECULAR EPIDEMIOLOGY

NEW TECHNOLOGIES

RISK ASSESSMENT

September 19 - 23, 2019

Capital Hilton | 1001 16th Street,
NW Washington, DC 20036

DNA REPAIR AND MUTAGENIC MECHANISMS

ENVIRONMENTAL GENETIC TOXICOLOGY

GERM CELL AND HERITABLE EFFECTS

APPLIED GENETIC TOXICOLOGY

EPIGENETICS

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Columbia University

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Environmental Mutagenesis and Genomics: The Next Fifty Years

September 19-23, 2019

Capital Hilton Washington DC

Washington, DC

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The Environmental Mutagenesis and Genomics Society was founded in 1969 and is incorporated under the laws of the District of Columbia. Its purpose is to encourage the study of mutagens in the human environment, particularly as they may affect public health, and to engage in and sponsor research and the dissemination of information related to mutagens. Membership is open to all interested scientists. www.emgs-us.org/page/emgsmembership

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EMGS Annual Meeting Event Site

On the Annual Meeting Event site you can view the abstracts for all sessions, build your agenda, see a list of attendees, and more.

To access the event site, use the following links:

EMGS Annual Meeting Site: <https://www.emgs-us.org/event/10/>

EMGS Special Symposium Site: <https://www.emgs-us.org/event/13/>

You will be asked for your login credentials (typically the email you used to register) and then your password (which defaults to your "registration code" that was sent to you in your confirmation email and is on the back of your registration badge.)

Changes in the program will be made in the Annual Meeting Event Site

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Environmental Mutagenesis and Genomics Society 50th Annual Meeting

Welcome to Washington, DC

Welcome to the 50th anniversary meeting of the Environmental Mutagenesis and Genomics Society. We hope you enjoy the meeting, which is designed to provide access to cutting-edge science as well as opportunities for socializing with friends and colleagues. Your Program Committee has assembled a large cast of Keynote Speakers, Symposia, Platform Presentations and Poster Sessions to inform, challenge and educate. Don't miss the opening symposium on Sunday morning, where you will receive a thorough course in EMGS history as well as a celebration of the next 50 years. Please enjoy the President's Reception (Thursday), the Pizza Party (Friday), the celebration at the National Press Club (Saturday) and the Awards Banquet (Sunday). To be successful in the future EMGS needs your participation, so please sign up for a Committee and attend Special Interest Group (SIG) meetings. Enjoy the meeting and please join us to help impact global health!

William K. Kaufmann, EMGS 2019 Program Chair
Miriam C. Poirier, EMGS 2019 President

EMGS Special Interest Groups: 2020 and Beyond

The Environmental Mutagenesis and Genomics Society (EMGS) Special Interest Groups (SIGs) are hubs of scientific focus in issues and cutting-edge advances. The SIGs must accurately reflect the broad scientific diversity of basic, applied, translational and clinical research in our Society. In 2019, a comprehensive review of EMGS SIGs was undertaken to envision restructuring aligned with current and future society initiatives. Council, SIG leaders and members were invited to discuss suggestions. Considerations included: 1) sunsetting or combining less attended SIGs, 2) maintaining SIGs in areas for growing EMGS membership, 3) adding new SIGs aligned with newly evolving scientific interests, 4) limiting the number of SIGs reducing competition for time/space, attendance and volunteers, 5) updating mission statements, and 6) evaluating SIG name changes. Consequently, the Epigenetics SIG expanded its visioning becoming the Epigenomics SIG. The Heritable Mutation and Disease SIG evolved into the Germ Cell and Heritable Effects SIG. Opportunities for broader collaborations resulted in merging the Risk Assessment, Molecular Epidemiology and Environmental Genetic Toxicology SIGs (name to be determined). Transgenic and In Vivo Mutagenesis SIG became the In Vivo Mutagenesis SIG. The DNA Repair and Applied Genetic Toxicology SIGs were unchanged. The New Technologies SIG will sunset in 2020, with assurance that new technologies and their applications are featured by all SIGs. A new Genomics SIG will host its inaugural meeting in 2019. EMGS members are encouraged to remain proactive with SIG and society leaders to keep the newest science at the forefront of the society, suggesting new or evolving SIGs as needed.

Klein, CB¹, Yauk, CL², Myers, MB³, Poirier, MC⁴. ¹ NYU School of Medicine, New York, NY, United States, ²Environmental Health Science and Research Bureau, Health Canada, Ottawa, Ontario, Canada, ³National Center for Toxicological Research, US FDA, Jefferson, AK, United States, ⁴Scientist Emeritus, National Cancer Institute, NIH, Bethesda, MD, United States

The EMGS Welcomes You

The EMGS recognizes the scientific achievements of our diverse membership, and fosters career development and advancement for everyone. We are committed to supporting all members of the EMGS community, irrespective of age, culture, ability, race, ethnicity, nationality, gender identity and expression, sexual orientation, marital status, religious affiliation or socioeconomic status. For questions, comments, or concerns, please contact the Committee for Diversity and Inclusion. www.emgs-us.org/page/diversity

General Information

Welcome to the 50th EMGS Annual Meeting!

This year marks 50 years of existence for the society and there are many events planned to commemorate this milestone as well as look forward to the next 50 years! EMGS was founded in 1969 in Washington, DC with the purpose of providing a forum for the establishment and support of scientists in the field of genomics and environmental mutagenesis. Over the past 50 years, our Society has helped shape public policy on the environment by providing critical information on environmental mutagens. While the initial focus of EMGS was on germ-cell mutagenesis, which remains an area of strong interest, today the EMGS is also the primary professional society for scientists involved in understanding mechanisms of DNA repair, mutagenesis, and the regulation of the epigenome, environmental genomics, consequences of mutation (such as cancer), and the evaluation of risk from genotoxic agents for mutagenesis, carcinogenesis, birth defects, and other disorders.

Meeting Highlights

Don't miss the 50th celebration plenary lecture, "Celebrating 50 Years of EMGS: A Visionary Idea Continues," on Friday at 8:30 am. There is also a very special "Champagne Toast" event at the National Press Club on Saturday from 7:30 to 9:30 pm. This is free to all meeting attendees. There will be food, drink, music and a beautiful view of Washington DC! There is an outstanding line up of keynote speakers throughout the meeting. The scientific program is packed with workshops, symposia, platform and poster sessions. Throughout there is a focus on the newest findings and technologies in basic and applied environmental science and how they are shaping future endeavors. In addition to the scientific program, be part of EMGS by joining an EMGS committee or one of the nine Special Interest Groups (SIGs) that represent the diversity of the Society and help program future EMGS meetings. The Banquet will be held on Sunday evening and will include award presentations, good food, great company, and lots of dancing.

Meeting attendees who are interested in bringing a guest to the banquet can purchase a ticket at the registration desk. Please note badges are required for all events and sessions.

Registration

The Registration Desk for the Modrich Symposium is located in Foyer 2. Beginning at 3:00 PM on Thursday the Registration Desk will be moved to the Capital Terrace hallway. The hours are listed below.

Wednesday 12:30 PM–3:00 PM
Thursday 7:00 AM–5:00 PM
Friday 7:00 AM–5:00 PM
Saturday 7:00 AM–5:00 PM
Sunday 7:00 AM–5:00 PM
Monday 7:00 AM–10:00 AM

Exhibit and Poster Hours

Thursday 5:30 PM–7:00 PM
Friday 7:00 AM–7:00 PM
Saturday 7:00 AM–7:00 PM
Sunday 7:00 AM–9:00 AM

Author-Attended Poster Hours

Thursday 5:00 PM–7:00 PM
Student and New Investigator posters attended.

Friday 5:00 PM–7:00 PM
Odd-Numbered posters attended.

Saturday 5:00 PM–7:00 PM
Even-numbered posters attended.

EMGS Committee Meetings

The EMGS committees are active throughout the year and meet during the conference. The committee meeting dates and times are noted in the agenda. Members are encouraged to be involved in a committee. Contact the committee chair if you are interested in serving on a committee.

EMGS Special Interest Group Meetings

The EMGS SIG meetings are a time-tested favorite of the Annual Meeting. The format provides free-form discussions and short presentations of the key challenges and research needs of the interest area. The SIGs provide a casual way for young investigators and seasoned researchers to interact. A continental breakfast will be provided.

Business Meeting

The Business Meeting will take place on Sunday at 4:30-5:30 PM in Federal AB. Plan to attend this meeting to obtain a brief overview of EMGS accomplishments to be shared by the EMGS leadership and the EMM Editor-in-Chief.

President's Welcome Reception and Student and New Investigator Poster Session

The Student & New Investigator Poster Session will be held during the President's Reception in the Congressional Ball Room at the Capital Hilton Hotel on Thursday, September 19, 5:30 PM to 6:45 PM. Student and New Investigators are asked to attend this event to present their posters and be part of the student poster competition. Each poster will be assigned a number which can be found in the printed program. The corresponding numbers will be on the poster boards. Posters can be put up from 2:00 PM to 5:00 PM on Thursday.

Poster Session 1

Will be held in the Congressional Ball Room at the Capital Hilton Hotel, Friday, September 20, from 5:00 PM to 7:00 PM. Odd numbered posters listed in the printed program will be presented at poster session 1.

Poster Session 2

Will be held in the Congressional Ball Room at the Capital Hilton Hotel Saturday, September 21, from 5:00 PM to 7:00 PM. Even numbered posters listed in the printed program will be presented at poster session 2.

Posters for poster sessions 1 & 2 should be affixed no later than 12:00 PM, Friday, September 20th.

If you are presenting a poster, it is important that you and/or your co-author(s) be present at the poster session in which your poster is assigned. This is the time during the conference when participants plan to meet you to discuss your work. The poster display closes at 9:00 am on Sunday, September 22. It is the responsibility of the poster presenter to remove the poster.

Speaker Ready Room Hours

The speaker ready room for the Modrich symposium and the EMGS meeting is Michigan.

Wednesday 10:00 AM – 5:00 PM
Thursday 7:00 AM – 5:00 PM
Friday 7:00 AM – 5:00 PM
Saturday 7:00 AM – 5:00 PM
Sunday 7:00 AM – 5:00 PM
Monday 7:00 AM – 5:00 PM

Photography Policy during Scientific Sessions

Photography and recording of scientific presentations are prohibited without advance specific consent of the presenter(s)/author(s). Session Chairs are asked to strictly enforce this policy, and individuals who do not comply will be asked to leave the session. In addition, cameras and recording devices are prohibited in the Exhibit Hall. Attendees are encouraged to take photographs of social events and provide them to EMGS staff for sharing with attendees. EMGS Annual Meeting registrants grant EMGS permission to reproduce, copy, and publish photographs taken at the Annual Meeting unless written notification by the registrant, stating otherwise, is submitted to the EMGS Headquarters office prior to the Annual Meeting or while registering on-site.

Internet Access at the Annual Meeting

The Capital Hilton is offering complimentary internet access in the hotel lobby. Internet access is not available in the meeting rooms or the meeting room foyers.

Meals

A light breakfast will be provided for those attending morning SIG and committee meetings beginning at 6:30 AM until 7:00 AM. A boxed lunch to be eaten in the meeting room is provided for those SIGs and committees meeting at noon. A lunch is also provided for the registrants of the Student and New Investigator Luncheon on Friday and for the registrants of the Women in the EMGS Luncheon on Saturday. Saturday's Champagne Toast will consist of sparkling wine or non-alcoholic beverages and heavy hor d' oeuvres. There will also be a cash bar for other drinks. Of course, dinner is provided at the EMGS banquet on Sunday. Information about Washington DC restaurants can be obtained from the Capital Hilton concierge.

Future Meetings

The 2020 EMGS Annual Meeting will take place Saturday, Sept 12, 2020- Wed, Sept 16, 2020, at the Renaissance Palm Springs Hotel 888 Tahquitz Canyon Way, Palm Springs, California

Special Interest Group/Committee Meetings at a Glance

Friday, September 20, 2019

7:00 AM - 8:15 AM	New Technologies SIG Germ Cell and Heritable Effects SIG Awards/Young Scientist Award Committee	Pan American Statler New York
12:00 - 1:15 PM	EMGS News Sub-Committee EMM Editorial Board Meeting Endowment Board	New York Ohio Pan American

Saturday, September 21, 2019

7:00 AM - 8:15 AM	Epigenomics SIG Applied Genetic Toxicology SIG Membership and Professional Development and Education, Student and New Investigator Affairs Committee	Pan American Statler New York
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Sunday, September 22, 2019

7:00 AM - 8:15 AM	Environmental Genetic Toxicology, Molecular Epidemiology, and Risk Assessment SIGs In Vivo Mutagenesis SIG Annual Meeting Publicity Sub-Committee	Pan American Statler New York
12:00 - 1:15 PM	Genomics SIG DNA Repair & Mutagenic Mechanisms SIG White Papers and Positions Papers Sub-Committee	Pan American Statler New York

Monday, September 23, 2019

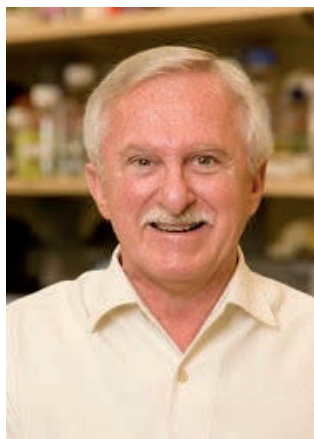
7:00 AM - 8:15 AM	Hollaender Outreach Committee Diversity and Inclusion Committee Publication Policy Committee	Pan American Statler New York
12:00 - 1:15 PM	Finance and Fundraising Committee Education, Student and New Investigator Affairs SIG Leaders	Pan American Statler Massachusetts
3:30 - 5:30 PM	2020 Program Committee	Pan American

EMGS Special Symposium Genome Maintenance Systems in Cancer Etiology and Therapy: A Tribute to Paul L. Modrich

September 18-19, 2019, Capital Hilton Washington DC

Co-Chairs: Guo-Min Li, Robert W. Sobol, Joann Sweasy, and Karen Vasquez

Organizing Committee: Bill Jack, Farid Kadyrov, Robert Lahue, Guo-Min Li, A-Lien Lu-Chang, Robert W. Sobol, Michael Su, Joann Sweasy, Karen Vasquez, Leroy Worth



Dr. Modrich is a James B. Duke Professor of Biochemistry at Duke University and Investigator at the Howard Hughes Medical Institute. He is known for his research on DNA mismatch repair and received the Nobel Prize in Chemistry 2015, jointly with Aziz Sanchar and Tomas Lindahl. The goal of this EMGS Special Symposium is to celebrate Dr. Modrich's career-long scientific contributions as a leader of the DNA repair field.

Sponsors



10:00 –5:00 PM **Speaker Ready Room** **Michigan**

September 18-19, 2019, Capital Hilton Washington, DC

EMGS Special Symposium **Federal AB**

**Genome Maintenance Systems in Cancer Etiology and Therapy:
A Tribute to Paul L. Modrich**

Co-Chairs: Guo-Min Li, Robert W. Sobol, Joann Sweasy, and Karen Vasquez
Organizing Committee: Bill Jack, Farid Kadyrov, Robert Lahue, Guo-Min Li, A-Lien Lu-Chang, Robert W. Sobol, Michael Su, Joann Sweasy, Karen Vasquez, Leroy Worth

Wednesday, September 18th, 2019

1:30 PM **Opening remarks** **Federal AB**
Robert W. Sobol, *University of South Alabama Mitchell Cancer Institute, USA*

1:35 –3:35 PM **Mechanisms of Genome Maintenance Systems I** **Federal AB**
Chair: Robert W. Sobol, *University of South Alabama Mitchell Cancer Institute, USA*

1:35 – 1:55 PM **The Effects of Mismatch Repair on Nuclear DNA Replication Fidelity in Budding Yeast**
Thomas Kunkel, *NIEHS, USA*

1:55 – 2:15 PM **MutSbeta and Triplet Repeat Expansions**
Robert Lahue, *National University of Ireland, Ireland*

2:15 – 2:35 PM **Integrative Single-Molecule Studies of DNA Mismatch Initiation**
Dorothy Erie, *University of North Carolina, USA*

2:35 – 2:55 PM **Regulation of Mismatch Repair**
Farid Kadyrov, *Southern Illinois University, USA*

2:55 – 3:05 PM **Phosphorylated PCNA Recruits Translesion DNA Polymerases and Promotes Cancer Progression by Activating the ATM/Akt/GSK3 β /Snail Signaling Pathway**
Janice Ortega, *UT Southwestern, USA*

3:05 – 3:15 PM **HDAC6 Regulates the DNA Damage Response via Deacetylating MLH1**
Xiaohong (Mary) Zhang, *Wayne State University School of Medicine, USA*

3:15 – 3:35 PM **The MRN Complex and Maintenance of Genomic Stability**
Tanya Paull, *University of Texas Austin, USA*

3:35 – 3:55 PM **Break** **South American AB**

Environmental Mutagenesis and Genomics Society 50th Annual Meeting

3:55 - 6:30 PM	Structure Insights and Drug Design Chair: Leroy Worth, <i>NIEHS</i>	Federal AB
3:55 – 4:15 PM	Structures and Operating Principles of the DNA Replisome Wei Yang, <i>NIH/NIDDK, Bethesda, USA</i>	
4:15 – 4:35 PM	Targeting Structural Changes to Control DNA Repair in Cancer John Tainer, <i>MD Anderson Cancer Center, USA</i>	
4:35 – 4:55 PM	Visualizing Transient States in Mismatch Repair Initiation Titia Sixma, <i>Netherlands Cancer Institute, Netherlands</i>	
4:55 – 5:15 PM	Inner Workings of DNA Mismatch Repair Machines Lorena Beese, <i>Duke University, USA</i>	
5:15 – 5:25 PM	Insight into DNA Mismatch Repair Initiation Through Monte Carlo Simulations and Functional Analysis Joyce Lebbink, <i>University Medical Center Rotterdam, Netherlands</i>	
5:25 – 5:35 PM	Biochemical and Structural Characterization of Two Variants of Uncertain Significance in the PMS2 Gene Aishwarya Prakash, <i>University of South Alabama, USA</i>	
5:35 – 5:45 PM	Visualizing REV1 Insertion at the Molecular Level Bret Freudenthal, <i>University of Kansas Medical Center, USA</i>	
5:45-6:30 PM	Poster Flash Talks (4 min each) Chair: Bill Jack, <i>New England BioLabs, USA</i> (Note Posters will be posted in South American AB)	Federal AB
P1	Chk1 Inhibitor is a Novel Therapeutic Agent for Melanoma Bor-Jang Hwang, <i>University of Maryland School of Medicine, Baltimore, MD, USA</i>	
P2	The Mutation Signatures Specific to DNA Alkylating Agents in Yeast and Cancers Natalie Saini, <i>Genome Instability and Structural Biology Laboratory, NIEHS, USA</i>	
P3	Targeted Oxidative Telomere Base Damage Induces Growth Arrest and Senescence in Normal Human Cells Ryan Barnes, <i>University of Pittsburgh Graduate School of Public Health and Hillman Cancer Center, USA</i>	
P4	Structural Basis for Recognition and Excision of 5-carboxylcytosine by Thymine DNA Glycosylase Lakshmi Swarna Mukhi Pidugu, <i>University of Maryland School of Medicine, USA</i>	
P5	Molecular Insight into APE1 Recession of 8-oxoGuanine Amy Whitaker, <i>University of Kansas Medical Center, USA</i>	
P6	Characterizing the APE1 DNA Intercalating Loop During DNA Sculpting Nicole Hoitsma, <i>University of Kansas Medical Center, USA</i>	
P7	Studying Thymine DNA Glycosylase (TDG) CpG Specificity Using 19F NMR Blaine Dow, <i>University of Maryland School of Medicine, USA</i>	
P8	Error-prone DNA Synthesis by DNA Polymerase θ Causes CAG Repeat Expansions Kara Chan, <i>UT Southwestern, USA</i>	
P9	Structural Characterization of REV1 Catalysis Tyler Weaver, <i>University of Kansas Medical Center, USA</i>	

P10 **Genome-Wide Mutagenesis Resulting from Topoisomerase 1-Processing of Unrepaired Ribonucleotides in DNA**
 Jessica Williams, *NIEHS, USA*

6:30 PM **Dinner** **Senate**

6:30- 8:30 PM **EMGS Executive Board Meeting** **Pan American**

Thursday, September 19th, 2019

7:00 AM – 5:00 PM **Speaker Ready Room** **Michigan**

8:30 - 10:10 AM **Mechanisms of Genome Maintenance Systems II** **Federal AB**

Chair: Karen Vasquez, *University of Texas Austin, USA*

8:30 – 8:50 AM **SMX and GEN1: Structure-Selective Nucleases Essential for the Resolution of Replication and Recombination Intermediates**
 Stephen West, *The Francis Crick Institute, UK*

8:50 – 9:10 AM **Maintenance of Genome Integrity: A Few Mechanisms Discovered Recently in Eukaryotic Cells**
 Daochun Kong, *Peking University, China*

9:10 – 9:30 AM **Mismatch Repair and Autoimmunity**
 Joann Sweasy, *Yale University, USA*

9:30 – 9:50 AM **The Role of Checkpoint Clamp in DNA Repair**
 A-Lien Lu-Chang, *University of Maryland Baltimore, USA*

9:50 – 10:00 AM **Dynamic Distribution of Single Strand Binding Protein on ssDNA Revealed by Precise Footprinting-Seq at Near Nucleotide Solution**
 Hailin Wang, *Research Center for Eco-Environmental Sciences, Chinese Academy of Sciences, China*

10:00 – 10:10 AM **Targeting Protein-DNA Interactions in the DNA Damage Response: Lead Identification and Optimization for Novel Inhibitors of Replication Protein A (RPA) and Ku**
 Katherine Pawelczak, *NERx Biosciences Inc., and Indiana University School of Medicine, USA*

10:10 – 10:30 AM **Break** **South American AB**

10:30 AM - 12:00 AM **Therapeutic Approaches** **Federal AB**

Chair: Joann Sweasy, *Yale University*

10:30 – 10:50 AM **Improving Chemotherapy by Inhibiting Mutagenic Translesion DNA Synthesis**
 Graham Walker, *MIT, Cambridge, USA*

10:50 – 11:10 AM **DNA Structure-Induced Genetic Instability: Mechanisms and Therapeutic Potential**
 Karen Vasquez, *University of Texas Austin, USA*

11:10 – 11:30 AM **Novel Mechanism Underlying Mismatch Repair Deficiency-Triggered Immunotherapy**
 Guo-Min Li, *UT Southwestern, USA*

Environmental Mutagenesis and Genomics Society 50th Annual Meeting

11:30 – 11:50 AM	Towards Therapeutically Modulating Disease-Associated Repeat Instability Christopher E. Pearson, <i>The Hospital for Sick Children</i>	
11:50 – 12:00 PM	FancA Promotes DNA Double Strand Break Repair by Catalyzing Single-Strand Annealing and Strand Exchange and Serves as a Potential Target for Cancer Treatment Yanbin Zhang, University of Miami School of Medicine, USA	
12:00- 2:00 PM	Lunch and Poster Session	Senate
2:00 - 3:40 PM	Mechanisms of Genome Maintenance Systems III Chair: Robert Lahue, <i>National University of Ireland Galway, Ireland</i>	Federal AB
2:00 – 2:20 PM	Chromosome Damage Repair via the BRCA1/2 Axis Patrick Sung, <i>University of Texas Health Science Center at San Antonio, USA</i>	
2:20 – 2:30 PM	Mutational Hotspots Resulting from Mutagens and Repair Deficient Strains in the <i>rpoB</i> gene of <i>Escherichia coli</i>: Perspective on Mutational Hotspots Jeffery Miller, <i>University of California, Los Angeles, USA</i>	
2:30 – 2:40 PM	Uracils in DNA: Causes and Consequences Ashok Bhagwat, <i>Department of Chemistry, Wayne State University, USA</i>	
2:40 – 3:00 PM	DNA Repair Pathway Crosstalk in Maintenance of Genome Stability Priscilla Cooper, <i>Lawrence Berkley National Laboratory, USA</i>	
3:00 – 3:20 PM	Regulation of Base Excision Repair Complex Assembly and Disassembly in Human Cells Robert W. Sobol, <i>University of South Alabama Mitchell Cancer Institute, Mobile, AL, USA</i>	
3:20 – 3:30 PM	The Lagging Strand is More Accurate but Lives Dangerously Roel Schaaper, <i>NIEHS, USA</i>	
3:30 – 3:40 PM	How to Make Biology Easier for the Future of Science <i>GenScript USA Inc. Piscataway, NJ, USA</i>	
3:40 – 4:00 PM	Break	South American AB
4:00 - 5:00 PM	Reflections on 50 Years in Science Chair: Guo-Min Li, <i>UT Southwestern</i>	Federal AB
4:00 – 4:15 PM	Genomic Maintenance Comes of Age Phil Hanawalt, <i>Stanford University, USA</i>	
4:15 – 4:30 PM	Almost 50 Years of Base Excision Repair Susan Wallace, <i>University of Vermont, USA</i>	
4:30 – 4:45 PM	Paul Modrich - A Biographical Sketch Errol Friedberg, <i>UT Southwestern, USA</i>	
4:45 – 5:00 PM	A Few of My Favorite Things Paul Modrich, <i>Duke University, USA</i>	
5:00 PM	Closing Remarks Guo-Min Li, <i>UT Southwestern, USA</i>	

Washington, DC – September 18-23, 2019

Thursday, September 19th, 2019

7:00 AM – 5:00 PM	Speaker Ready Room	Michigan
3:00 –5:00 PM	EMGS Council Meeting	Massachusetts
8:00- 12:50AM	Workshop 1 Sponsored by Lhasa Limited	Pan American
	Scientific and Regulatory Updates on Non-Mutagenic and Mutagenic Impurities in Pharmaceuticals	
	Chair: Patricia Escobar, <i>Merck Inc.</i> and Brinda Mahadevan, <i>Abbot</i>	
8:00-8:10 AM	Introduction Brinda Mahadevan, <i>Abbott Healthcare Pvt. Ltd, Mumbai, India</i>	
8:10-8:40 AM	Update of IQ Consortium – Non Mutagenic Impurities (NMI) Joel Bercu, <i>Gilead USA</i>	
8:40-9:10 AM	Considerations for Deriving Non-Mutagenic (NMI) Exposure Limits Mark Powley, <i>Merck & Co., Inc., USA</i>	
9:10-9:40 AM	Regulatory Perspective on Non-mutagenic Impurities (NMI) Tim McGovern, <i>FDA</i>	
9:40-10:00 AM	Break	
10:00-10:30 AM	Update on the DrugSafe IQ consortium on mutagenic Impurities (QSAR review of impurities) John Nicolette, <i>AbbVie USA</i>	
10:30-11:00 AM	ICH M7 and Biotherapeutics: Out of Scope but Relevant Zhanna Sobol, <i>Pfizer USA</i>	
11:00-11:30 AM	Regulatory Perspective on Mutagenic Impurities and ICH M7 Roland Frotschl, <i>EMA, bfarm, Germany</i>	
11:30-11:50 AM	Q&A Followed by a Panel Discussion	

**50th Anniversary of the Environmental Mutagenesis and Genomics Society
Special Issue**

<https://tinyurl.com/yytoufq8>



8:45-3:34PM	Workshop 2	Statler
	Sponsored by Escher Family Fund and EMM	
	Heritable Hazards of Smoking: Applying the “Clean Sheet” Framework to Further Science and Policy	
	Co-Chairs: Francesco Marchetti, <i>Health Canada</i> , Jill Escher, <i>Escher Fund for Autism</i> , Young Investigator Co-chair: Abigail Bline, <i>UCLA</i>	
	Organizing Committee: Abigail Bline, <i>UCLA</i> , Kerry Dearfield, <i>Retired (formerly at USDA and EPA)</i> , David DeMarini, <i>US EPA</i> , Jill Escher, Francesco Marchetti, Carole Yauk, <i>Health Canada</i>	
8:45-9:00 AM	Welcome, Opening Remarks, and Introductions Jill Escher, <i>Escher Fund for Autism</i>	
9:00-9:20 AM	The Clean Sheet Initiative and Its Potential to Identify the Risks of Heritable Consequences of Tobacco Smoke Exposures Kerry L. Dearfield, <i>Retired (formerly at USDA and EPA)</i> , Burke, VA	
9:20-9:40 AM	Rationale for This Workshop: Growing Concern Regarding Heritable and Intergenerational Effects from Environmental Exposures Carole L. Yauk, <i>Health Canada</i>	
9:40-10:00 AM	The Potentially Vulnerable Periods of Exposure to the Male and Female Germline Jacquetta Trasler, <i>McGill University, Montreal, ON, Canada</i>	
10:00-10:20 AM	Break	
10:20-10:40 AM	Tobacco Smoke Exposure: Hazardous Components of Tobacco and Related products; Broad Overview of Known Health Effects; Tobacco-Induced Male Germ Cell and Heritable Effects Francesco Marchetti, <i>Health Canada</i>	
10:40-11:00 AM	Male-Mediated Heritable Epigenetic Effects Jacquetta Trasler, <i>McGill University, Montreal, ON, Canada</i>	
11:00-11:20 AM	Overview of Asthma and Allergy Epidemiology: Epigenetic Studies of Transgenerational Effects of Smoking John Holloway, <i>University of Southampton, UK</i>	
11:20-11:40 AM	Multigenerational Transmission of Hyperactivity/ADHD Pradeep Bhide, <i>Florida State University, Tallahassee, FL, USA</i>	
11:40-11:50 AM	Grandmaternal Smoking and Risk for ADHD Gyeyoon Yim, <i>PhD candidate, TF Chan School of Public Health, Harvard, MA, USA</i>	
11:50-12:10 PM	The RHINESSA Cohort, a Three-Generation Study on the Association of Tobacco Smoking with Asthma Cecillie Svanes, <i>University of Bergen, Norway</i>	
12:10-12:30 PM	Panel Discussion of the Evidence	
12:30-1:30 PM	Lunch (provided)	
1:30-2:00 PM	Toxicology of E-cigarettes Ilona Jaspers, <i>University of North Carolina, NC, USA</i>	
2:00-2:30 PM	Discussants Implications for Bioethics Anne Le Goff, <i>Institute for Society and Genetics, UCLA, CA, USA</i> Implications for Public Health Advocacy Laurent Huber, <i>Executive Director, ASH, Washington, DC, USA</i>	

2:30-3:30 PM	Directed Discussion and Consensus Opinion Methods and data to study intergenerational effects of these products and how to apply the Clean Sheet Framework. Is there a need for regulatory policy to emphasize germ cell risk in addition to somatic cell risk? Next steps?
12:00-4:30 PM	Workshop 3 New York Sponsored by Health and Environmental Sciences Institute (HESI) OECD Assessment of Miniaturized Ames Assays: Results and Recommendations Co-Chairs: Birgit Mertens, <i>Sciensano, Brussels, Belgium</i> , Leon F. Stankowski, Jr. <i>Charles River Laboratories, Skokie, IL, USA</i>
12:00-12:15 PM	Pick up Box Lunch (provided)
12:15-12:30 PM	Overview of OECD Process to Evaluate Miniaturized Ames Assays Birgit Mertens, <i>Sciensano, Brussels, Belgium</i>
12:30-1:00 PM	The 6-Well Ames Assay John Nicolette, <i>AbbVie, North Chicago, IL, USA</i>
1:00-1:30 PM	The 24-Well Ames Assay Leon F. Stankowski, Jr., <i>Charles River Laboratories, Skokie, IL, USA</i>
1:30-2:00 PM	The Ames II/MPF Assay Kamala Pant, <i>BioReliance, Rockville, MD, USA</i>
2:00-2:30 PM	Technical Comparisons Among Assays Birgit Mertens, <i>Sciensano, Brussels, Belgium</i>
2:30-3:00 PM	Coffee Break
3:00-3:45 PM	Qualitative and Quantitative Comparisons of Assays Paul White, <i>Health Canada</i>
3:45-4:30 PM	Discussion and Closing Summary Birgit Mertens, <i>Sciensano, Brussels, Belgium</i>

Thursday, September 19th, 2019

**Environmental Mutagenesis and Genomics Society
50th Annual Meeting**

Environmental Mutagenesis and Genomics: The Next Fifty Years

5:30 PM - 6:45 PM	EMGS President's Welcome Reception Congressional and Student and New Investigator Poster Session (Student and New Investigators will need to be with their posters)
7:00 PM - 8:00 PM	K1 Keynote 1 Presidential Ballroom EMGS Presidential Keynote Address The Generation and Repair of Nuclear DNA Replication Errors Thomas A. Kunkel, <i>NIH Distinguished Investigator</i>

Environmental Mutagenesis and Genomics Society 50th Annual Meeting

Friday, September 20, 2019

7:00 AM – 5:00 PM		Speaker Ready Room	Michigan
7:00 AM - 8:15 AM		<p>Special Interest Group/Committee Meetings</p> <p>New Technologies Germ Cell and Heritable Effects Awards/Young Scientist Award Committee</p>	<p>Pan American Statler New York</p>
8:30 AM - 12:00 PM		<p>Symposium 1</p> <p>Sponsored by Elsevier</p> <p>Celebrating 50 Years of EMGS: A Visionary Idea Continues</p> <p>Co-Chairs: David M. DeMarini, <i>US EPA, RTP, NC</i>, Miriam C. Poirier, <i>NCI, Bethesda, MD</i></p>	Presidential Ballroom
8:30–9:00 AM		<p>K2 Keynote 2</p> <p>Protecting Our Most Vital Assets—Our Genome and Our Environment: The 50- Year Legacy of EMGS David M. DeMarini, <i>US EPA, RTP, NC</i></p>	Presidential Ballroom
9:00–9:15 AM	S1	<p>The Continuing Evolution of Genetic Toxicity Testing and the EMGS Errol Zeiger, <i>Errol Zeiger Consulting, Chapel Hill, NC</i></p>	
9:15–9:30 AM	S2	<p>DNA Repair: From Mechanistic Insights to EMGS Outreach Initiatives Philip C. Hanawalt, <i>Stanford University, Stanford, CA</i></p>	
9:30–9:45 AM	S3	<p>Stress-Induced Mutagenesis: From SOS to the DNA Damage Response Joann B. Sweasy, <i>Yale University School of Medicine, New Haven, CT</i></p>	
9:45–10:00 AM	S4	<p>A Twinkle in Our Founders' Eyes: The Next Generation of Germ-Cell Mutation Research Carole L. Yauk, <i>Health Canada, Ottawa, ON, Canada</i></p>	
10:00–10:30 AM		Coffee Break	
10:30–10:45 AM	S5	<p>How Much Is Too Much? The Shifting Paradigm for Genetic Toxicity Assessment Paul White, <i>Health Canada, Ottawa, ON, Canada</i></p>	
10:45–11:00 AM	S6	<p>Epigenetics: Ghosts of Environment Past, Present, and Future Christopher D. Faulk, <i>University of Minnesota, St. Paul, MN</i></p>	
11:00–11:15 AM	S7	<p>Genotoxicity Biomarkers: The 50-Year Revolution in Molecular Epidemiology Luoping Zhang, <i>University of California, Berkeley, CA</i></p>	
11:15–11:30 AM	S8	<p>Implementing a Founding Goal of EMGS: Mutagenicity Risk Assessment Kerry L. Dearfield, <i>USDA/EPA (Retired), Burke, VA</i></p>	
11:30–11:45 AM	S9	<p>EMGS: The Movie! Hilde van Gijssel, <i>Valley City State University, Valley City, ND</i></p>	
11:45 AM –12:00 PM	S10	<p>The Next 50 Years and Open Discussion Miriam C. Poirier, <i>National Cancer Institute, Bethesda, MD</i></p>	
12:00 - 1:15 PM		<p>Student/New Investigator Luncheon</p> <p>Becoming a Resilient Scientist Sharon Milgram, <i>Director of the NIH Office of Intramural Training and Education</i></p> <p>Committee/Board Meeting</p> <p>Public Relations EMM Editorial Board Meeting</p>	<p>Senate</p> <p>New York Ohio</p>

1:30 - 3:30 PM **Symposium 2** **Presidential Ballroom**

Bridging the Gap Between Science and Policy

Co-Chairs: Bret Freudenthal, *University of Kansas Medical Center*, Stephanie L. Smith-Roe, *National Toxicology Program/ National Institute of Environmental Health Sciences*

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|--------------|-----|---|
| 1:30-2:00 PM | S11 | From Bench to Beltway: Becoming a Science Advocate?
Yvette Seger, <i>Director of Science Policy, Federation of American Societies for Experimental Biology</i> |
| 2:00-2:30 PM | S12 | Reaching the Public and Policymakers through Journalism
Meredith Drosback, <i>SciLine</i> |
| 2:30-3:00 PM | S13 | How to Get Washington to Care about Science
Heidi Heitkamp, <i>Past US Senator from North Dakota</i> |
| 3:00-3:30 PM | S14 | Science Policy and Policy for Science, or How to Engage Science in Making Informed or Decisions
Kei Koizumi, <i>former advisor in the White House Office of Science and Technology Policy</i> |

1:30 - 3:30 PM **Symposium 3** **South American AB**

Sponsored by Escher Family Fund

Understanding the Heritable Effects of Germ-Cell Exposures 50 Years after the Founding of the EMGS

Co-Chairs: Carole L. Yauk, *Health Canada*, Jill Escher, *Escher Fund for Autism*; Young Investigator Co-Chair: Mathia Colwell, *University of Minnesota*

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|--------------|-----|---|
| 1:30-2:00 PM | S15 | Environmental Determinants and Epigenomic Mediators of Germ-Cell Next Generational Health Outcomes
Jacquetta Trasler, <i>McGill University, Montreal, Canada</i> |
| 2:00-2:15 PM | S16 | Dissecting the Mechanisms of Epigenetic Transgenerational Inheritance
Patrick Allard, <i>University of California</i> |
| 2:15-2:45 PM | S17 | Trans- and Intergenerational Epigenetic Inheritance in Allergic Diseases
John Holloway, <i>University of Southampton, United Kingdom</i> |
| 2:45-3:00 PM | S18 | DNA Damage in Male Germ Cells and De Novo Germ Line Mutations in Wild Type and OGG1-/- Big Blue® Mice Following Exposure to Benzo(a)pyrene
Ann-Karin Olsen, <i>The Norwegian Institute of Public Health, Dept. of Molecular Biology, Oslo, Norway</i> |
| 3:00-3:30 PM | S19 | Heritable Effects of Agents of General Anesthesia
Anatoly Martynyuk, <i>University of Florida, Gainesville, FL</i> |

Environmental Mutagenesis and Genomics Society 50th Annual Meeting

1:30 - 3:30 PM		Platform 1	Federal AB
		New Technologies	
		Co-Chairs: Barbara Parsons, US Food and Drug Administration / NCTR and Kelly Harris, National Center for Toxicological Research	
1:30-1:45 PM	1	The Potential for Fully Automated Scoring of the Cytokinesis Block Micronucleus Cytome Assay Using Imaging Flow Cytometry Matthew Rodrigues, <i>Luminex Corporation</i>	
1:45-2:00 PM	2	Evidence that Black Cohosh Extracts Destabilize Microtubules, Resulting in Aneugenicity Stephen Dertinger, <i>Litron Laboratories</i>	
2:00-2:15 PM	3	Repair Assisted Damage Detection (RADD) Harnesses DNA Repair Machinery for in situ DNA Adduct Detection Natalie Gassman, <i>University of South Alabama College of Medicine</i>	
2:15-2:30 PM	4	Development of A Transcriptomic Biomarker to Detect Histone Deacetylase Inhibition in TK6 Cells Eunnara Cho, <i>Environmental Health Science and Research Bureau, Health Canada</i>	
2:30-2:45 PM	5	Interlaboratory Validation of the ToxTracker Genotoxicity Assay Giel Hendricks, <i>Toxys</i>	
2:45-3:00 PM	6	Development of the High-Throughput Genotoxicity Testing using a Transcriptomic Biomarker Henghong Li, <i>Georgetown University</i>	
3:00-3:15 PM	7	Assessment of the on- and off-Targets Effects of a CRISPR-Based Cytosine-to-Thymine Base Editor Targeting the LacZ Gene in E. coli Javier Revollo, <i>Food and Drug Administration</i>	
3:15-3:30 PM	8	Whole Genome Sequencing Analysis of Small and Large Colony Mutants from the Mouse Lymphoma Assay Xiaoqing Guo, <i>National Center for Toxicological Research, US Food and Drug Administration</i>	
3:30 - 4:30 PM		EMGS Award	Presidential Ballroom
	L1	The Impact of DNA Damage and Transcription Stress on Aging and Protection by Nutrition Jan Hoeijmakers, <i>Erasmus University Medical Center, The Netherlands</i>	
4:30 - 5:00 PM		Flash Talks	Federal AB
5:00 - 7:00 PM		Poster Session 1: Odd Numbers (See Pages 32-37)	Congressional
7:00 - 9:00 PM		President's Pizza Party	Presidential Suite

Saturday, September 21, 2019

7:00 AM – 5:00 PM		Speaker Ready Room	Michigan
7:00 AM - 8:15 AM		Special Interest Group/Committee Meetings Epigenomics Applied Genetic Toxicology Membership and Professional Development and Education, Student and New Investigator Affairs Committee	Pan American Statler New York
8:30 - 9:30 AM	K3	Keynote 3 Translational Research to Prevent Environmental Threats to Children's Developing Brains Frederica Perera, <i>Columbia University, New York City, NY US</i>	Presidential Ballroom
10:00 AM - 12:00 PM		Symposium 4 Early Life Vulnerabilities to Environmental Exposures: From Molecular Mechanisms to Regulatory Efforts Co-Chairs: Nina Holland, <i>University of California</i> , Andres Cardena, <i>Harvard University</i>	Presidential Ballroom
10:00-10:25 AM	S20	Chromatin Vulnerabilities of Early Germ Cells Victor Corces, <i>Emory University</i>	
10:25-10:50 AM	S21	DNA Methylation and Health Outcomes in Birth Cohorts Nina Holland, <i>University of California</i>	
10:50-11:15 AM	S22	Prenatal Environmental Exposures, Epigenetics and Child Neurodevelopment Andres Cardenas, <i>Harvard University</i>	
11:15-11:35 PM	S23	piRNA Expression in the Soma and its Potential Association with Perinatal Lead Exposure Bamberandage Pinithi Perera, <i>University of Michigan</i>	
11:35-12:00 PM	S24	Research and Regulatory Implications of Germline, Fetal, and Early Life Vulnerabilities to Drugs and Chemicals Jill Escher, <i>Escher Fund for Autism</i>	
10:00 AM - 12:00 PM		Symposium 5 Weeding out DNA Damage in a Garden of Six Billion Bases: Advances in Understanding Lesion Detection Co-Chairs: Stephanie L. Smith-Roe, <i>National Toxicology Program/ National Institute of Environmental Health Sciences</i> , Bennett Van Houten, <i>University of Pittsburgh Cancer Institute</i>	South American AB
10:00-10:30 AM	S25	Teaching an Old Dog New Tricks: Novel Role of UV-DDB in Base Excision Repair Bennett Van Houten, <i>University of Pittsburgh Medical Center</i> ,	
10:30-11:00 AM	S26	FeS-Containing DNA Repair Proteins: Chewing their Way through the Genome Sheila S. David, <i>University of California</i>	
11:00-11:30 AM	S27	Monkey Business: How to Move in the DNA Jungle Karolin Luger, <i>University of Colorado Boulder</i> , and Howard Hughes Medical Institute	
11:30-11:45 AM	S28	Identifying DNA and Enzyme Structural Features Necessary for MutY Glycosylase Detection of Specific DNA Damage Sites Using Single Molecule Fluorescence Microscopy Andrea Lea, <i>University of Vermont</i>	

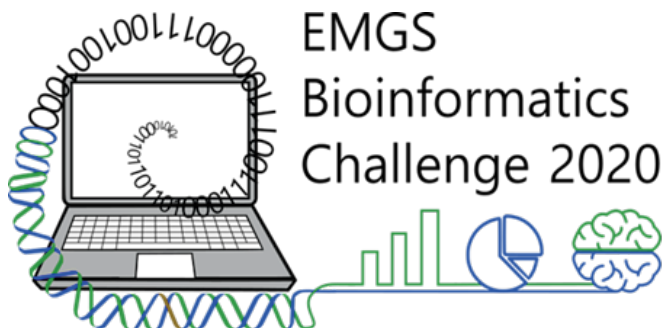
Environmental Mutagenesis and Genomics Society 50th Annual Meeting

11:45-12:00 PM	S29	Characterizing the APE1 DNA Intercalating Loop During DNA Sculpting Nicole Hoitsma, <i>University of Kansas Medical Center</i>	
10:00 AM - 12:00 PM		Platform 2	Federal
		DNA Damage & Environmental Disease Risk	
		Co-Chairs: <i>Rosalie Elespuru US Food and Drug Administration, Caren Weinhouse, Oregon Health & Science University</i>	
10:00-10:15 AM	9	Mutational Imprints of Cobalt Exposure: A Genome-Scale Multi-system Approach Jiri Zavadil, <i>International Agency for Research on Cancer, Lyon, France</i>	
10:15-10:30 AM	10	Bioflavonoids induce DNA Double-Strand Breaks by Topoisomerase II-dependent and –independent Mechanisms Donna Alice Goodenow, <i>University of North Carolina at Charlotte</i>	
10:30-10:45 AM	11	Mutational Signature Analysis for Molecular Cancer Epidemiology: The Example of Aristolochic Acid Steven George Rozen, <i>Duke-NUS Medical School</i>	
10:45-11:00 AM	12	A Roadmap from Hotspot Cancer Driver Mutation Quantification to Cancer Prediction Barbara Parsons, <i>US Food and Drug Administration</i>	
11:00-11:15 AM	13	Evaluating the genotoxicity of mixtures of pyrrolizidine alkaloids with differing relative potencies demonstrates additivity of effects Ashley Allemang, <i>The Procter & Gamble Company</i>	
11:15-11:30 AM	14	How Low Can You Go? An Analysis Of Lowest Effective Dose In The Ames Test Grace Kocks, <i>Lhasa Limited</i>	
11:30-11:45 AM	15	The Mutation Signatures Specific To DNA Alkylating Agents In Yeast And Cancers Natalie Saini, <i>National Institute of Environmental Health Sciences</i>	
11:45-12:00 PM	16	Modeling aging and degenerative disease in DNA repair-deficient Drosophila Elyse Bolterstein, <i>Northeastern Illinois University</i>	
12:00 - 1:15 PM		Women in EMGS Luncheon	Senate
		Endometrial Cancer: Genomics and Genetics Daphne Bell, <i>National Human Genome Research Institute/NIH</i>	
1:30 - 3:30 PM		Symposium 6	Presidential Ballroom
		Oceans and Environmental Health	
		Chair: <i>Rob Sobol, University of South Alabama Mitchell Cancer Institute</i>	
1:30-2:00 PM	S30	Lake Center for Fresh Waters and Human Health: Using Advanced ‘Omics Techniques and Novel Technologies to Investigate Environmental Drivers of Toxic Cyanobacterial Blooms, Discover Novel Compounds, and Improve Cyanotoxin Monitoring Timothy Davis, <i>Bowling Green State University</i>	
2:00-2:15 PM	S31	TBA	
2:15-2:45 PM	S32	Urbanization and Climate Change: A Recipe for Disaster for Ecosystem and Human Health Geoffrey Scott, <i>Arnold School of Public Health</i>	
2:45-3:00 PM	S33	TBA	

3:00-3:30 PM	S34	<p>The Greater Caribbean Center for Ciguatera Research – Examining the Impact of Climate Change on Ciguatera and its Toxic Metabolites Through the Food Web and the Mechanisms of Human Cell Genotoxicity Robert W. Sobol, <i>University of South Alabama Mitchell Cancer Institute</i></p>
1:30 - 3:30 PM		<p>Symposium 7 South American AB Sponsored by Millipore Sigma Mechanisms of Genomic Instability: from DNA Structure to Human Disease and Aging</p> <p>Co-Chairs: Phil Hanawalt, <i>Stanford University</i>, Bevin Engelward, <i>Massachusetts Institute of Technology</i></p>
1:30-2:00 PM	S35	<p>Duplex Sequencing Mimics Nature’s Approach for Accurate DNA Replication: Extensive Subclonal Mutations in Human Cancers Lawrence A. Loeb, <i>University of Washington, Seattle, WA, USA</i></p>
2:00-2:15 PM	S36	<p>Breaking Bad: Aberrant DNA Repair and Repeat Expansion in Fragile X Syndrome Karen Usdin, <i>The National Institute of Diabetes and Digestive and Kidney Diseases, Bethesda, MD, USA</i></p>
2:15-2:45 PM	S37	<p>Topoisomerase II-induced Chromosome Breakage and Translocation Is Determined by Chromosome Architecture and Transcriptional Activity André Nussenzweig, <i>Laboratory of Genome Integrity, National Cancer Institute, Bethesda, MD, USA</i></p>
2:45-3:00 PM	S38	<p>Oxidative DNA Damage Can Be Mutagenic or Epigenetic Cynthia Burrows, <i>University of Utah, Salt Lake City, UT, USA</i></p>
3:00-3:30 PM	S39	<p>How Cells Regulate Mutagenesis and Their Ability to Evolve Susan Rosenberg, <i>Baylor College of Medicine, Houston, TX, USA</i></p>
1:30 - 3:30 PM		<p>Symposium 8 Federal AB Low-Dose Mutagenic Responses: Biology, Assumptions and Challenges in Protecting Human Health</p> <p>Co-Chairs: Catherine Gibbons, <i>US EPA, Washington, DC, USA</i>, David Eastmond, <i>University of California, CA, USA</i></p>
1:30-2:00 PM	S40	<p>Dose-Response Lessons from Ultra-Low Dose Cancer Studies of the Mutagenic Carcinogens Dibenzo[d,e,f,p] Chrysene and Aflatoxin B1 in Trout David Williams, <i>Oregon State University</i></p>
2:00-2:15 PM	S41	<p>Impact of Radiation Dose Rate on Mammary Gland Development and Immune System Janice M. Pluth, <i>University of Nevada, Las Vegas, NV</i></p>
2:15-2:45 PM	S42	<p>Genotoxicity Mechanisms Driving Non-linear Dose Responses- Highlights From a GUM Review and a Food Impurity Example Stefan Pfuhler, <i>Procter and Gamble</i></p>
2:45-3:00 PM	S43	<p>Preferential Tissue Dysregulation of the Mouse Epigenome by Low Dose 5-aza-2’deoxycytidine Exposure Mathia L Colwell, <i>University of Minnesota</i></p>
3:00-3:30 PM	S44	<p>Factors Influencing Mutagenic Mode of Action Determinations and their Role in Low Dose Extrapolations of Carcinogenic Risk David Eastmond, <i>University of California, Riverside</i></p>
3:30 - 4:30 PM	L2	<p>Alexander Hollaender Award Lecture: Presidential Ballroom Epigenetics in Human Health and Disease Randy Jirtle, <i>North Carolina State University</i></p>

4:30 - 5:00 PM **Flash Talks** **Federal AB**

5:00 - 7:00 PM **Poster Session 2: Even numbers (See pages 32-37)** **Congressional**



See poster 72

Attention data scientists and genetic and computational toxicologists! We are now accepting applications for the EMGS Bioinformatics Challenge 2020. It will be held at the annual meeting from September 12th to 16th, 2020 in Palm Springs, CA.

<https://www.emgs-us.org/page/bioinformatics>

7:30 - 9:30 PM **Champagne Toast at National Press Club** **National Press Club**

Come celebrate EMGS' 50th Anniversary with a Champagne Toast at the National Press Club. This special event is free to all annual meeting attendees. Enjoy Music, Camaraderie, Celebration, Hor d'oeuvres and Champagne, and beautiful views of The White House, Washington Monument and historic Willard Hotel.

National Press Club
529 14th Street, NW, 13th Floor
Washington, DC 20045

How do I get from the Capital Hilton to the National Press Club?

The best entrance is on 14th Street, just off F Street, which is the National Press Building. The Press Club is on the 13th Floor. Once you get off the elevators on the 13th Floor, go through the security turnstiles and a receptionist will greet you. She or he will tell you where the First Amendment and Holeman Lounge rooms are. (The rooms are very close to the reception area.)

What is the best entrance for someone with special needs?

The best entrance is at 14th and F Streets.

The National Press Club is .7 miles from the Capital Hilton to the National Press Club. Make sure you have this QR on your name badge for access through the turnstile.



Sunday, September 22, 2019

7:00 AM – 5:00 PM		Speaker Ready Room	Michigan
7:00 AM - 8:15 AM		Special Interest Group/Committee Meetings Environmental Genetic Toxicology, Molecular Epidemiology, and Risk Assessment In Vivo Mutagenesis Annual Meeting Publicity	Pan American Statler New York
8:30 - 9:30 AM		K4 Keynote 4	Presidential Ballroom
		Science on the International Space Station: Preparing NASA for the Next Fifty Years Sarah Wallace, <i>National Aeronautics and Space Administration (NASA), Houston, TX, USA</i>	
10:00 AM - 12:00 PM		Symposium 9	Presidential Ballroom
		Circadian Clock Disruption and its Impact on Genomic Instability and Environmental Carcinogenesis Co-Chairs: Shobhan Gaddameedhi, <i>Washington State University</i> , Michael G. Kemp, <i>Wright State University</i>	
10:00 AM - 10:30 AM	S45	Implementing Circadian Medicine: From Skin Biomarkers to New Therapies John Hogenesch, <i>University of Cincinnati</i>	
10:30 AM - 11:00 AM	S46	Cryptochromes Integrate Circadian Rhythms with Metabolism and Genome Protection Katja Lamia, <i>Scripps Research Institute</i>	
11:00 AM - 11:30 AM	S47	Dynamic Interaction Between the Clock Proteins and DNA Damage Response Signaling Carla Finkielstein, <i>Virginia Tech Institute</i>	
11:30 AM - 12:00 PM	S48	Solar UV-B Induced Erythema and Environmental Carcinogenesis: The Circadian Clock is Ticking Shobhan Gaddameedhi, <i>Washington State University</i>	
10:00 AM - 12:00 PM		Symposium 10	South American AB
		Novel Strategies for High Throughput Assessment of Genetic Toxicity Co-Chairs: Rosalie Elespuru, <i>US Food and Drug Administration</i> and Paul White, <i>Health Canada</i>	
10:00 - 10:25 AM	S49	High Throughput Microarray Technology for Genotoxicity and Cytotoxicity Bevin Engleward, <i>Massachusetts Institute of Technology</i>	
10:25 - 10:50 AM	S50	MultiFlow - A High Information Content Assay that Provides Genotoxic Mode of Action Predictions and Insights into Potency and Molecular Targets Stephen Dertinger, <i>Litron Laboratories</i>	
10:50 - 11:10 AM	S51	Assessment of Genotoxicity Potential Using High Throughput Screening Approaches: The Tox21 Experience Kristine Witt, <i>NTP, National Institute of Environmental Health Sciences</i>	
11:10 - 11:30 AM	S52	ToxTracker Assay for High-Throughput Screening of Genetic Toxicity and Mode of Action Giel Hendricks, <i>Toxys, Netherlands</i>	
11:30 - 12:00 PM	S53	Genome-wide and Targeted CRISPR Functional Approaches in Toxicology Christopher Vulpe, <i>University of Florida</i>	

Environmental Mutagenesis and Genomics Society 50th Annual Meeting

10:00 AM - 12:00 PM		Platform 3	Federal AB
		Epigenomics and Genomics	
		Co-Chairs: Patrick Allard, Chris Faulk, and Isabelle Miousse	
10:00-10:15 AM	17	A Genomic Atlas of Systemic Interindividual Epigenetic Variation in Humans Chathura Gunasekara, <i>Baylor College of Medicine</i>	
10:15-10:30 AM	18	Regulation of the Epigenetic Response to Oxidative Damage Heather O'Hagan, <i>Indiana University School of Medicine</i>	
10:30-10:45 AM	19	Smoking and Mutations in Sperm DNA Jonatan Axelsson, <i>Lund University</i>	
10:45-11:00 AM	20	RING1A Ubiquitinates Histone H2A at Sites of Platinum-Induced Damage Heather O'Hagan, <i>Indiana University School of Medicine</i>	
11:00-11:15 AM	21	Genetic and Epigenetic Effects in a Population of Underground Miners with Coal Workers Pneumoconiosis Diana Maria Narvaez, Human Genetics Laboratory, Universidad de los Andes	
11:15-11:30 AM	22	Genome-wide Analysis of Aadmium-Induced Germline Mutations Over 1,123 Generations Nathan Keith, <i>Indiana University</i>	
11:30-11:45 AM	23	Ultra-Sensitive Duplex Sequencing Reveals Influence of Exogenous Stressors on Mitochondrial DNA Mutagenesis Tess Leuthner, <i>Duke University</i>	
11:45-12:00 PM	24	Mouse Liver miRNA Expression Profile as a Molecular Marker of Low Dose Rates Gamma Radiation, in Two Mouse Strains Ann-Karin Olsen, <i>Norwegian Institute of Public Health</i>	
12:00 - 1:15 PM		Special Interest Group/Committee Meetings	
		Genomics	Pan American
		DNA Repair & Mutagenic Mechanisms	Statler
1:30 - 3:30 PM		Symposium 11	Presidential Ballroom
		Application of 3D Organoid Models to investigation of Carcinogenesis, Drug Development and Genetic Toxicology	
		Chair: Jeffrey Bemis, <i>Litron Laboratories</i>	
1:30-2:00 PM	S54	Bioprinting 3D Vascularized Tissue Models Alisa Morss Clyne, <i>University of Maryland</i>	
2:00-2:30 PM	S55	Design and Implementation of a 3D Organotypic Model of the Human Mesothelium for High-Throughput Screening Hillary Kenny, <i>University of Chicago</i>	
2:30-3:00 PM	S56	Development of Advanced In Vitro Lung and Prostate Cancer Models for Hazard Assessment Steven Evans, <i>Swansea University</i>	
3:00-3:15 PM	S57	Validation of a Study Design for the Evaluation of the Genotoxic Potential of Cosmetic Ingredients using 3D Human Skin Tissue Model as a Test System Shambhu Roy, <i>MilliporeSigma</i>	
3:15-3:30 PM	S58	Integrating Respiratory Toxicity and Genotoxicity Endpoints in an in Vitro Model of Human Origin for Assessing Hazard to Styrene Exposure Yiyang Wang, <i>National Center for Toxicological Research</i>	

1:30 - 3:30 PM **Symposium 12** **South American AB**
Quantitative Analysis of Genetic Toxicity Dose-Response Data for Risk Assessment and Regulatory Decision-Making

Co-Chairs: Kerry Dearfield, *USDA/EPA (retired)*, Paul White, *Health Canada*; New Investigator Co-Chair: Alexandra Long, *Health Canada*

- 1:30- 1:40 PM **Introductory Remarks**
 Alexandra Long, *Health Canada, Ottawa, Canada*
- 1:40-2:00 PM S59 **From Hazard Identification to Risk Assessment: A Paradigm Shift in Genetic Toxicology**
 James MacGregor, *Toxicology Consulting Services, Bonita Springs, FL, USA*
- 2:00-2:45 PM S60 **Interpretation of Genetic Toxicity Dose Response Data and Use of Point-of-Departure Metrics for Risk Assessment and Regulatory Decision-making**
 Wout Slob, *National Institute for Public Health and the Environment (RIVM), Bilthoven, The Netherlands.*
- 2:45-3:00 PM S61 **Adjustment Factors for Regulatory Interpretation of Genetic Toxicity Point-of-Departure Metrics**
 Paul White, *Health Canada, Ottawa, Canada.* Stefan Pfuhrer, *Procter and Gamble*
- 3:00-3:15 PM S62 **Case Studies Related to Quantitative Interpretation of Genetic Toxicity Dose-Response Data**
 Alexandra Long, *University of Toronto*
- 3:15-3:30 PM S63 **Characterization and Management of Genotoxic Risk**
 Kerry Dearfield, *USDA/EPA (retired)*

1:30 - 3:30 PM **Platform 4** **Federal AB**
DNA Damage Response II

Co-Chairs: Khadijeh Alnajjar, *Yale University*, Bret Freudenthal, *University of Kansas Medical Center*

- 1:30-1:45 PM 25 **Deciphering the Roles of PARP1/ARTD1 in the Preservation of Telomere Integrity**
 Elise Fouquerel, *Thomas Jefferson University and Sydney Kimmel Medical College*
- 1:45-2:00 PM 26 **Investigating the Impact of Oxidized and Therapeutic dNTPs on Telomerase Activity**
 Samantha Sanford, *University of Pittsburgh*
- 2:00-2:15 PM 27 **Targeted Oxidative Telomere Base Damage Induces Growth Arrest and Senescence in Normal Human Cells**
 Ryan Barnes, *University of Pittsburgh*
- 2:15-2:30 PM 28 **G-quadruplex Induced Genomic Instability in the Absence of Functional Topoisomerase 1**
 Alexandra Berroyer, *University of Texas Health Science Center*
- 2:30-2:45 PM 29 **Structural and Biochemical Analysis of the 3'→5' Exonuclease Apn2 of *Saccharomyces Cerevisiae***
 Jessica Wojtaszek, *National Institute of Environmental Health Sciences*
- 2:45-3:00 PM 30 **A Novel Regulation Mechanism of OGG1 Under Oxidative Stress**
 Khadijeh Alnajjar, *Yale University School of Medicine*
- 3:00-3:15 PM 31 **Single Molecule Analysis Reveals Monomeric XPA Bends DNA and Undergoes Episodic Linear Diffusion During Damage Search**
 Emily Beckwitt, *University of Pittsburgh School of Medicine*

Environmental Mutagenesis and Genomics Society 50th Annual Meeting

3:15-3:30 PM	32	Mechanistic Insight into Oxidized Ribonucleotide Insertion by a Human DNA Polymerase Mallory Smith, <i>University of Kansas Medical Center</i>	
3:30 - 4:30 PM	L3	Young Scientist Award Lecture DNA Repair Landscape of Human Blood Cells Zachary D. Nagel, <i>Harvard T.H. Chan School of Public Health</i>	South American AB
4:30 - 5:45 PM		EMGS Business Meeting	Federal AB
5:45 - 6:45 PM		Emeritus/Retiree Interest Group Mixer	
7:00 - 11:00 PM		EMGS Awards Banquet	Presidential Ballroom

Monday, September 23, 2019

7:00 AM - 5:00 PM		Speaker Ready Room	Michigan
7:00 AM - 8:15 AM		Special Interest Group/Committee Meetings Hollaender Outreach Committee Diversity and Inclusion Committee Publication Policy Committee	Pan American Statler New York
8:30 - 4:30 PM		Genome Integrity Assays Program (by invitation)	California
8:30 - 9:30 AM	K5	Keynote 5 Clinical Computational Oncology for Precision Cancer Medicine Eliezer Van Allen, <i>Broad Institute of MIT and Harvard, Cambridge, MA, USA</i>	Presidential Ballroom
10:00 AM - 12:00 PM		Symposium 13 Carcinogenic Potential of Glyphosate-Based Herbicides: Human, Animal and Mechanistic Evidence Co-Chairs: Luoping Zhang, <i>University of California, Berkeley, CA, USA</i> , Maria Zhivagui, <i>University of California, San Diego, CA, USA</i>	Presidential Ballroom
10:00 - 10:30 AM	S64	Evaluation of the Carcinogenicity of Glyphosate by the IARC Monographs Program and New Developments Kurt Straif, <i>International Agency for Research on Cancer (IARC), Lyon, France</i>	
10:30 - 11:00 AM	S65	Exposure to Glyphosate-Based Herbicides and Risk for Non-Hodgkin Lymphoma: A Meta-analysis and Supporting Evidence Luoping Zhang, <i>School of Public Health, University of California, Berkeley</i>	
11:00 - 11:30 AM	S66	Effects of Glyphosate-Based Herbicides at Doses Considered Safe (US ADI): Animal Evidence Fiorella Belpoggi, <i>Cesare Maltoni Cancer Research Center, Ramazzini Institute, Bologna, Italy</i>	
11:30 - 12:00 PM	S67	Evaluation of Glyphosate, (Aminomethyl)phosphonic Acid, and Glyphosate-Based Formulations for Genotoxicity and Oxidative Stress Using In Vitro Approaches Stephanie Smith-Roe, <i>National Toxicology Program/ National Institute of Environmental Health Sciences</i>	

10:00 AM - 12:00 PM **Symposium 14** **Congressional**

Mutation Rates and Evolution

Co-Chairs: Joann Sweasy, *Yale University*, Natalie Saini, *National Institute of Environmental Health Sciences*

- 10:00 - 10:40 AM S68 **Evolution of Replication and Transcription Error Rates Across the Tree of Life**
Michael Lynch, *Center for Mechanisms of Evolution, Arizona State University*
- 10:40 - 11:20 AM S69 **From Statistical Models to Biological Mechanisms of Human Mutation**
Shamil Sunyaev, *Harvard University*
- 11:20 - 12:00 AM S70 **Somatic Mosaicism in Human Brain Development**
Flora Vaccarino, *Yale University Child Study Center*

10:00 AM - 12:00 PM **Platform 5** **Federal AB**

DNA Damage Response I

Co-Chairs: Shan Yan, *University of North Carolina*, Amy Whitaker, *University of Kansas Medical Center*

- 10:00-10:15 AM 33 **Carbonyl Electrophiles Induce Topoisomerase-DNA Covalent Complexes**
Les Hanakahi, *University of Illinois at Chicago*
- 10:15-10:30 AM 34 **Molecular Characterization of the Telomerase Active Site**
Matt Schaich, *University of Kansas Medical Center*
- 10:30-10:45 AM 35 **High-Resolution Genome-Wide Maps of Benzo[a]pyrene-Induced DNA Damage Formation and Repair in Humans**
Wentao Li, *University of North Carolina School of Medicine, Chapel Hill*
- 10:45-11:00 AM 36 **APE2 Couples ATR-Chk1 DNA Damage Response with DNA single-strand Break Repair**
Shan Yan, *University of North Carolina at Charlotte*
- 11:00-11:15 AM 37 **Repetitive DNA and Genetic Instability of the PKD1 Gene**
Erik Larson, *Western Michigan University*
- 11:15-11:30 AM 38 **Cyanonitroanilines (Aminonitrobenzotrioles): Mutagenicity Studies and Characterization of a Novel Cyclic dG Adduct**
David Josephy, *University of Guelph*
- 11:30-11:45 AM 39 **Molecular Insight into APE1 Recession of 8-oxoGuanine**
Amy Whitaker, *University of Kansas Medical Center*
- 11:45-12:00 AM 40 **Dangerous Beauty: Oxidative DNA Damage and Epithelial Mesenchymal Transitions Elicited by Nano-Enabled Consumer Product Exposures in Airway Epithelial Cells**
Christa Wright, *Georgia State University*

12:00 - 1:15 PM

Special Interest Group/Committee Meetings

Finance and Fundraising
Education, Student and New Investigator Affairs
SIG Leaders

Pan American
Statler
Massachusetts

Environmental Mutagenesis and Genomics Society 50th Annual Meeting

1:30 - 3:30 PM		Symposium 15	Presidential Ballroom
		DNA repair: The Next 50 years	
		Co-Chairs: Patricia Opresko, <i>University of Pittsburgh, PA, USA</i> , Ashwaya Prakash, <i>University of South Alabama Mitchell cancer Institute, USA</i>	
1:30 - 1:55 PM	S71	Novel Precision Tools for Studying DNA Damage and Repair Patricia Opresko, <i>University of Pittsburgh, PA, USA</i>	
1:55 - 2:20 PM	S72	MutSβ Stimulates Holliday Junction Resolution by the SMX Tri-Nuclease Steve West, <i>The Francis Crick Institute, United Kingdom</i>	
2:20 - 2:45 PM	S73	Targeting DNA Repair: Beyond Cancer Thomas Helleday, <i>Karolinska Institutet, Sweden</i>	
2:45 - 3:10 PM	S74	DNA 3R and Genome Stability Wei Yang, <i>NIH/DI</i>	
3:10 - 3:30 PM	S75	Visualizing REV1 Insertion at the Molecular Level Bret David Freudenthal, <i>Department of Biochemistry and Molecular Biology, University of Kansas Medical Center, Kansas City, KS</i>	
1:30 - 3:30 PM		Symposium 16	Congressional
		Sponsored by The Genome Repair Foundation	
		DNA as a Biomarker of Human Health: Associations Between Human Mutagenesis and Genomic Instability with Disease and Implications for Regulatory Testing	
		Co-Chairs: Kristine Witt, <i>DNTP/ National Institute of Environmental Health Sciences</i> , Clint Valentine, <i>TwinStrand Biosciences</i>	
1:30 - 1:55 PM	S76	Towards an Integrated, Single-Cell Assay for the Quantitative Analysis of Genome Sequence Integrity Jan Vijg, <i>Albert Einstein College of Medicine</i>	
1:55 - 2:20 PM	S77	Somatic Mutations and Brain Aging Mike McConnell, <i>UVA School of Medicine</i>	
2:20 - 2:45 PM	S78	Large, Three-Generation CEPH Families Reveal Post-Zygotic Mosaicism and Variability in Germline Mutation Accumulation Aaron R. Quinlan, <i>University of Utah. Salt Lake City, UT</i>	
2:45 - 3:10 PM	S79	Germ Cell Mutations: A Return to the Roots of the EMGS Francesco Marchetti, <i>Health Canada</i>	
3:10 - 3:30 PM	S80	Nuclear and Mitochondrial Mutagenesis as a Biomarker of Aging and Disease Jason Bielas, <i>Fred Hutchison Cancer Research Center</i>	
3:30 - 5:30 PM		2020 Program Committee Meeting	Pan American
		51st EMGS Annual Meeting Saturday, Sept 12, 2020- Wed, Sept 16, 2020 Renaissance Palm Springs Hotel 888 Tahquitz Canyon Way, Palm Springs, California	

Posters

Presenting Author is Underlined

Odd Number Posters Attended on Friday, September 20, 2019

Even Number Posters Attended on Saturday, September 21, 2019

P1

Biochemical and Structural Characterization of two Variants of Uncertain Significance in the PMS2 Gene. Prakash A, D'Arcy B, Blount J. University of South Alabama, AL, United States.

P2

Caught in Motion: Human NTHL1 Undergoes Interdomain Rearrangement Necessary for Catalysis. Carroll BL¹, Zahn KE², Cao V¹, Wallace SS¹, Doublé S¹. ¹University of Vermont, Burlington, VT, United States, ²Yale School of Medicine and Howard Hughes Medical Institute, New Haven, CT, United States.

P3

DNA damage assessment in primary human hepatocytes using CometChip assay. Seo JE, Wu Q, Ren L, Shi Q, Mei N, Guo X. National Center for Toxicological Research, US Food and Drug Administration, Jefferson, AR, United States.

P4

Insertion of a nucleotide diphosphate by a DNA polymerase. Varela F, Freudenthal B. University of Kansas Medical Center, Kansas City, KS, United States.

P5

Night Shift Disrupts DNA Repair and Increases DNA Damage in Humans. Koritala BSC¹, Porter KI¹, Gajula RP¹, Manjanatha MG², Van Dongen HPA¹, Gaddameedhi S¹. ¹Washington State University, Spokane, WA, United States, ²National Center for Toxicological Research, AR, United States.

P6

The Landscape of DNA Base Lesions Governs Somatic Trinucleotide Repeat Instability Through DNA Base Excision Repair. Lai Y, Liu Y. ¹Florida International University, Miami, FL, United States.

P7

Cancelled

P8

Antigenotoxic Effect of Epigallocatechin-3-Gallate (EGCG) on Bleomycin In Vitro Induced DNA Damage in Human Lymphocytes. Vaglenov A, Hoffman P, Claus E, Lee V, Dudley R, Ringenberg J. The University of Findlay, Findlay, OH, United States.

P9

ATR Kinase Activity Promotes the Viability and Proliferative Capacity of Quiescent Human Keratinocytes Exposed to UVB Radiation. Kemp M, Shaj K. Wright State University Boonshoft School of Medicine, Dayton, OH, United States.

P10

Background and Induced Mutant Frequencies in Toxicology-Relevant Tissues from Big Blue® Transgenic Mice and Rats. Young, RR. Milliporesigma, Rockville, MD, United States

P11

Comparative Analysis of Mutational Signatures of Different Oxidizing Agents in Yeast Single Strand DNA. Placentra VC¹, Degtyareva NP¹, Saini N², Sterling JF², Klimczak LJ³, Gordenin DA², Doetsch PW¹. ¹Mutagenesis and DNA Repair Regulation Group, NIEHS, Durham, NC, United States, ²Mechanisms of Genome Dynamics Group, NIEHS, Durham, NC, United States, ³Integrative Bioinformatics Support Group, NIEHS, Durham, NC, United States.

P12

Death by dGTP Starvation. Schaaper RM, Glenn KF. Genome Integrity and Structural Biology Laboratory, National Institute of Environmental Health Sciences, Research Triangle Park, NC, United States.

P13

Detection of the Small Oligonucleotide Products Of Nucleotide Excision Repair In UVB-irradiated Human Skin. Kemp M³, Choi J^{1,2}. ¹Korea Research Institute of Standards and Science, Republic of Korea, ²University of Science & Technology, Republic of Korea, ³Wright State University Boonshoft School of Medicine, Dayton, OH, United States

P14

Distinct Signatures of Redox Stress in Single Strand DNA in Yeast and of Aging in Human Mitochondrial DNA. Degtyareva NP¹, Saini N², Sterling JF², Placentra VC¹, Klimczak LJ³, Gordenin DA² and Doetsch PW¹. ¹Mutagenesis and DNA Repair Regulation Group, NIEHS, Durham, NC, United States, ²Mechanisms of Genome Dynamics Group, NIEHS, Durham, NC, United States, ³Integrative Bioinformatics Support Group, NIEHS, Durham, NC, United States.

P15

Drug-induced Replication Stress Promotes Mutagenic DNA Repair and Genome Instability in Mammalian Genomes. Minocherhomji S¹, Liu Y, He Y, Fielden M. Amgen, Thousand Oaks, CA, United States.

P16

Evaluating Non-Covalent DNA-Binders in The MultiFlow® Assay. Roberts DJ, Soomer-James J, Miller M, Kwok V, Stankowski, Jr. LF. Charles River Laboratories, Horsham, PA, United States.

P17

Evaluation of Acylamide – and Glycidamide – induced cll Mutations in the Brain of Big Blue Mice. Shelton S, Mei N, Manjanatha MG. National Center for Toxicological Research, US FDA, Jefferson, AR, United States.

P18

Generating Comet Assay Historical Data for Mouse Testis. Pant K, Bruce S, Springer S, Laforce MK, Young M, Kulkarni R. BioReliance, MilliporeSigma, Rockville, MD, United States.

P19

Non-enzymatic Roles of Human RAD51 At Stalled Replication Forks. Mason JM^{1,2}, Chan YL¹, Weichselbaum RW¹, Bishop DK¹. ¹University of Chicago, Chicago, IL, United States, ²Clemson University, Clemson, SC, United States.

P20

Antigenotoxic Effect of Epigallocatechin-3-Gallate (EGCG) On Bleomycin *In Vitro* Induced DNA Damage in Human Lymphocytes. Vaglenov A, Hoffman P, Claus E, Lee V, Dudley R, Ringenberg J. University of Findlay, Findlay OH, United States.

P21

Structural Characterization of REV1 Catalysis. Weaver TM, Cortez LM, Freudenthal BD. University of Kansas Medical Center, Kansas City, KS, United States.

P22

The Lagging Strand is More Accurate but Lives Dangerously. Schaaper, RM¹, Maslowska KH¹, Makiela-Dzbenka K², Fijalkowska IJ². ¹Genome Integrity and Structural Biology Laboratory, National Institute of Environmental Health Sciences, Research Triangle Park, North Carolina, USA, and ²Institute of Biochemistry and Biophysics, Polish Academy of Sciences, Warsaw, Poland.

P23

Are Silver Nanoparticles (AgNp) Mutagenic to a Marine Amphipod Via Feeding Exposure? Botelho MT¹, Umbuzeiro GA^{1,2}, Passos MJARC¹, Trevizani TH¹, Figueira RCL¹, Gomes V¹. ¹University of São Paulo, São Paulo, SP, Brazil, ²University of Campinas, Limeira, SP, Brazil.

P24

Characterizing The Role Of TDP1 During Development in *Drosophila Melanogaster*. Becker VA, Onofrei D, Bolterstein E. Northeastern Illinois University, Chicago, IL, United States.

P25

Circadian Clock Disruption Impairs the Skin's DNA Damage Response to Solar UVB And Increases Mutagenicity. Dakup P, Porter K, Gajula RP, Gaddameedhi S. Washington State University, Spokane, WA, United States.

P26

Diet-Induced Obesity Increases Susceptibility to Ethyl Carbamate-Induced Mutagenesis in C57BL/6J Mice. Lichtler RC, Wilson MJ, Wickliffe JK. Tulane University School of Public Health and Tropical Medicine, New Orleans, LA, United States.

P27

DMC1 Gain-Of-Function Variant that Promotes Nucleoprotein Filament Formation Exhibits Enhanced Homologous DNA Pairing Activity. Goodson SD¹, Kelso AA¹, Costantini LM², Waldvogel SM¹, Dwyer DS³, Griffith JD², Sehorn MG¹. ¹Clemson University, Clemson, SC, United States, ²Lineberger Comprehensive Cancer Center, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina, United States, ³LSU Health Sciences Center-Shreveport, Shreveport, LA, United States.

P28

Dysregulation of Human NTHL1 and Genomic Instability. Kar A, Doetsch PW. The National Institute of Environmental Health Sciences, Durham, NC, United States.

P29

In Vivo Micronucleus Test In Human Peripheral Blood Reticulocytes. Basal Levels In An Urban Population. Beltrán R, Montero DR. Environmental Toxicology Department, Institute of Biomedical Research, Universidad Nacional Autónoma de México, Mexico City, Mexico.

P30

Incorporation Of 5',8-Cyclodeoxyadenosine Lesions In The Promoter Region Of MiRNAs By A DNA Repair Polymerase. Tsegay P¹, Lai Y¹, Chatgililoglu C², Liu Y¹. Florida International University, Miami, FL, United States, ²ISOF - CNR, Bologna, Italy.

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Investigations into the Step-to-Step Coordination of Base Excision Repair. Fairlamb MS¹, Bain FE², Boehm EM², Spies M², Washington MT², Freudenthal BD¹. ¹University of Kansas Medical Center, Kansas City, KS United States, ²Carver College of Medicine, University of Iowa, Iowa City, IA United States.

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UV-DDB: An Early Responder in the Repair of Oxidative DNA Damage. Kumar N¹, Jang S¹, Watkins S¹, Bruchez MP^{1,2}, Opresko PL¹, Van Houten B¹. ¹University of Pittsburgh, Pittsburgh, PA, United States, ⁴Carnegie Mellon University, Pittsburgh, PA, United States.

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Genotoxicity of 4-Methoxy-TEMPO and the Possible Underlying Mechanisms. Mei N, Guo X, Dial S, Chen S, Guo L. National Center for Toxicological Research, Jefferson, AR, United States.

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Assessing Formaldehyde-induced Hematopoietic Stem Cell Toxicity Derived from BALB/c Mouse Lungs and Nose *ex vivo*. Magaña LC¹, Zhao Y^{1,2}, Zhang L¹. ¹School of Public Health, University of California, Berkeley, CA, United States, ²School of Life Sciences, Central China Normal University, Wuhan, China.

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Environmental Systems Biology of Childhood Asthma. Choi H¹, Song W², Wang M², Sram R^{3,4}, Zhang B². ¹State University of New York at Albany School of Public Health, Rensselaer, NY, United States, ²Icahn School of Medicine at Mount Sinai, New York, NY, United States, ³Institute of Experimental Medicine, Academy of Sciences of the Czech Republic, v.v.i., Videňská Prague, Czech Republic ⁴University of Chemistry and Technology, Prague, Czech Republic.

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Bowhead Whale Lung Cells Maintain Homologous Recombination Repair and Resist Genomic Instability during Prolonged Particulate Chromate Exposure. Wise Sr. JP¹, Lu H¹, Browning CL^{1,2}, Wise SS¹, Toyoda JH¹, Speer RM¹. ¹University of Louisville, Louisville, Kentucky, United States. ²Brown University, Providence, Rhode Island, United States.

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Calpain Activity in Leukocytes is Associated with Diabetes Biochemical Markers. Salazar AM¹, Pánico P¹, Burns AL¹, Díaz-Villaseñor A¹, Torres-Arellano JM¹, Juárez-Nájera A¹, González RE², Alvarez AM², Zacarías-Castillo R², Ostrosky-Wegman P¹. ¹Universidad Nacional Autónoma de México (UNAM), Mexico City, Mexico, ²Hospital General “Dr. Manuel Gea González”, Mexico City, Mexico.

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Microsatellite Mutation Rates in the Bone Marrow of Wild River Otters (*Lontra Canadensis*) from the Athabasca Oil Sands Region of Alberta, Canada. O'Brien JM^{1,2}, Curry J², Ha K³, Browning J¹, Zahaby Y¹, Thomas PJ^{1,3}. ¹Environment and Climate Change Canada, Ottawa, ON, Canada, ²Carleton University, Ottawa, ON, Canada, ³University of Ottawa, Ottawa, ON, Canada.

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Oxidative DNA Damage in Miners Occupational Exposed to Mercury: Effect of XRCC1 Polymorphisms. Groot H¹, Narváez DM¹, Palma RM², Diaz S³. ¹Universidad de los Andes, Bogotá, Colombia, ²Grupo Salud Ambiental y Laboral, Dirección de Investigación, INS, Bogotá, Colombia, ³Grupo Factores de Riesgo Ambiental, Dirección de Vigilancia y Análisis de Riesgos en Salud Pública, INS, Bogotá, Colombia.

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Reassessment of the Genetic Toxicity of Triclosan. Liu Y, Sun D, Zhao T, Li X, Lai Y, Zhang Z. Sichuan University West China School of Public Health, Chengdu, Sichuan, China.

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Differential Gene Expression Analysis in Mouse Placentae Reveals Association Between Preterm Birth Linked Genes and PM2.5 Exposure. Schanzer A¹, Blum JL¹, Chen LC¹, Deyssenroth MA², Chen J², Zelikoff JT¹. ¹New York University Langone School of Medicine, New York City, NY, United States. ²Icahn School of Medicine at Mount Sinai, New York City, NY, United States.

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Formaldehyde Inhalation Induces Hematopoietic Stem and Progenitor Cell Toxicity in Exposed Mice. Zhao Y^{1,2}, Cui H², Huang J², Looney M³, Li R², Zhang L¹. ¹University of California, Berkeley, CA, United States, ²Central China Normal University, Wuhan, China, ³University of California, San Francisco, San Francisco, CA, United States.

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The Mutagenic Potential of 2-Phenylbenzotriazole-9-Nob Chlorinated (Non-CL PBTA-9), a Byproduct of the Disperse Violet Azo Dye. Tanamachi AR¹, Fernandes FH¹, Vendemiatti JS², Prediger P², Umbuzeiro GA² Salvadori, DMF¹. ¹São Paulo State University, Botucatu, SP, Brazil, ²School of Technology, State of Campinas, Limeira, SP, Brazil.

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Effect of Honey with Associated Antioxidant on Lipopolysaccharide (LPS) Induced Lung Inflammation in Mice. Takeuchi M¹, Uno M¹, Hirano Y¹, Hamada S¹, Nakata H¹, Kawazoe A¹, Pinkerton KE². ¹Kyoto Sangyo University, Kyoto, Japan ²University of California Davis, CA, United States.

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Impact of Air Pollution to the Oxidative Damage in Newborns. Sram RJ¹, Ambroz A¹, Urbancova K², Rossner Jr P¹, Svecova V¹, Topinka J¹, Gramblicka T², Pulkrabova J², Hajslova J², Veleminsky Jr M³. ¹Institute of Experimental Medicine AS CR, Prague, Czech Republic; ²University of Chemistry and Technology, Prague, Czech Republic; ³University of South Bohemia, Ceske Budejovice, Czech Republic.

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Regulation of Nitric Oxide Signaling by Progesterone in an in vitro Placental Cell Culture System. Keshava A, Szilagyi J, Manuck T, Fry RC. ¹University of North Carolina, Chapel Hill, NC, United States.

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Experimental Models Elucidate the Relationship Between Genetic and Epigenetic Alterations During Carcinogen-Mediated Cell Transformation. Korenjak M¹, Pandey M¹, Thakur S^{1,2}, Grainger T¹, Renard C¹, Debornes L¹, Weber Z³, Hušková H¹, Cuenin C¹, Bergstrom E⁴, Eicher T³, Stampfer M⁵, Jelinek J⁶, Stopka T², Herceg Z¹, Alexandrov L⁴, Mathé E³, Zavadil J¹. ¹International Agency for Research on Cancer, Lyon, France; ²Biocev, First Faculty of Medicine, Charles University, Prague, Czech Republic, ³Ohio State University, Columbus, OH, United States, ⁴University of California San Diego, San Diego, CA, United States, ⁵Lawrence Berkeley National Laboratory, Berkeley, CA, United States, ⁶Temple University, Philadelphia, PA, United States.

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Sexual Epigenetic Dimorphism in the Human Placenta: Differential miRNA Expression Between the Male and Female Placenta.

Eaves LA¹, Phookphan P², Rager JE^{1,3}, Bangma J¹, Smeester L¹, O'Shea TM⁴, Fry RC^{1,3}. ¹Gillings School of Global Public Health, University of North Carolina at Chapel Hill, Chapel Hill, NC, United States, ²Chulabhorn Research Institute, Laksi, Bangkok, Thailand, ³School of Medicine, University of North Carolina, Chapel Hill, North Carolina, United States

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DNA methylation patterns in Fundulus heteroclitus exposed to power plant thermal effluent. Drown MK¹, Drown CG², Faulk C², Crawford DL¹, Oleksiak MF¹, ¹University of Miami Rosenstiel School of Marine and Atmospheric Science, Miami, FL, United States, ²University of Minnesota, St. Paul, MN, United States.

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Environmental Exposures and Omics Research in Pregnant Women and Children: from Metabolomics to DNA Methylation. Tindula G, Huen K, Eskenazi B, Holland N. University of California, Berkeley, Berkeley, CA, United States.

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Perinatal Lead (Pb) Exposure's Trimester-specific Effect on DNA Methylation in Umbilical Cord Blood. Rygiel CA¹, Goodrich JM¹, Perng W², Jones TR¹, Solano M³, Hu H⁴, Tellez-Rojo MM³, Peterson KE¹, Dolinoy DC¹. ¹University of Michigan School of Public Health, Ann Arbor, MI, United States. ²Colorado School of Public Health, Aurora, CO, United States. ³National Institute of Public Health, Cuernavaca, México. ⁴University of Washington, Seattle, WA, United States.

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Transcriptomic Responses in Livers of GenX-treated Mice Demonstrate Up-regulation of PPAR Signaling and Related Pathways. Chappell GA¹, Thompson CM¹, Wolf J², Cullen J³, Haws LC¹. ¹ToxStrategies, Inc. ²Experimental Pathology Laboratories, Inc. ³North Carolina State University, College of Veterinary Medicine, NC, United States.

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Evaluation Of Germline Mutations Induced By Ethyl Methanesulfonate In Different Reproductive Development Stages Of Caenorhabditis Elegans Using Whole Genome Sequencing. Yan, J¹, Pan BH¹, Chen Y¹, Robison TW², Heflich RH¹, Du HChen T¹. ¹National Center for Toxicological Research, Food and Drug Administration, Jefferson, AR, United States, ²Food and Drug Administration, Silver Spring, MD, United States, ³University of California at Riverside, Riverside, CA, United States.

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Mutagenicity Of Silver Nanoparticles Evaluated Using Whole Genome Sequencing In Mouse Lymphoma Cells. Yan J¹, Chen T¹, Pan BH¹, Kaldhore PR¹, Guo XQ¹, Chen Y¹, Zhou T², Robison TW³. ¹National Center for Toxicological Research, Food and Drug Administration, Jefferson, AR, United State, ²Food and Drug Administration, Rockville, MD, United States, ³Food and Drug Administration, White Oak, MD, United States.

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Mutation Quantitation Using Error-corrected Next Generation Sequencing of Known Mutant Fractions on Kras Codon 12. McKinzie P, Bishop M. National Center for Toxicological Research, Food and Drug Administration, Jefferson, AR, United States.

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The Sensitivity of Transcriptomics BMD Modeling to the Methods Used for Microarray Data Normalization. Mezencev, R¹, Auerbach, S². ¹NCEA, Office of Research and Development, U.S. Environmental Protection Agency, Washington DC, United States, ²National Institute of Environmental Health Sciences, National Institutes of Health, RTP, NC, United States.

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A Stand-Alone Software Tool With a Graphical User Interface Employing Machine-Learning and Digital Signal Processing (ML-DSP) for Accurate Genome-Wide Classification of Human Mitochondrial Diseases and Cancer Types. Randhawa GS¹, Hill KA¹, Kari L². ¹University of Western Ontario, London, ON, Canada, ³University of Waterloo, Waterloo, ON, Canada.

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Machine Learning – Digital Signal Processing and genomic signatures to elucidate the ancestral proteobacterial origin of mitochondria. Soltysiak M¹, Randhawa GS¹, Kari L², Hill KA¹. ¹University of Western Ontario, ON, Canada, ²University of Waterloo, ON, Canada.

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EMGS Bioinformatics Challenge 2020 - Be a Part of the Largest Computational Genetic Toxicology Event of the Year. Bemis JC¹, Leung M². ¹Litron Laboratories, Rochester NY, United States, ²University of California, Davis, CA, United States.

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Loss-of-function mutations in LRRK2 identify a subset of invasive mammary carcinomas with distinct morphology, aggressive behavior and high mutational burden. Sanders LH, Parrilla Castellar ER, Davis R, Gonzalez-Hunt C. Duke University Medical Center, Durham, NC, United States.

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Triclosan: Emerging Pollutant with Reprotoxic Effect? Ramos-Morales P¹, Parra-Barrera SD¹, Muñoz-Hernandez A. Facultad de Ciencias, UNAM, Mexico City, México.

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MMS's Multigenerational and Transgenerational Effects on the Reproductive Capacity and the Recombination Frequency in Germ Cell of the Maternal Line of Drosophila melanogaster. Arroyo E¹, Ramos P. Universidad Nacional Autónoma de México, Mexico City, México.

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Variation in Signatures of Cadmium-induced Mitochondrial DNA Mutations Reveal Evolutionary Effects of Pollution. Leuthner TC¹, Keith RN², Jackson C³, Glaholt SP³, Meyer JN¹, Shaw JR³. ¹Nicholas School of the Environment, Duke University, Durham, NC, United States. ²Lawrence Berkeley National Laboratory, Berkeley, CA, United States. ³Indiana University, Bloomington, IN, United States.

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Products, Materials and Services - Comparative Study of Discharge Systems: Bibliographical, Economic and Statistical Approach. Albuquerque TT, Muller M, Ruiz EF. SABESP - Companhia de Saneamento Básico do Estado de São Paulo, Brazil.

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GeneTox21 – An Integrated Platform for In vitro Genetic Toxicity Assessment and Regulatory Evaluation of New and Existing Substances. Long AS¹, Chepelev N¹, Engelward B², Yauk CL¹, Dertinger SD³, Witt K⁴, Smith-Roe S⁴, Barton-MacLaren T⁵, Woodland C⁶, Wills J⁷, Ferguson S⁴, Thomas R⁸, White PA¹. ¹Environmental Health Science and Research Bureau, Health Canada, Ottawa, ON, Canada, ²Massachusetts Institute of Technology, Cambridge, MA, ³Litron Laboratories, Rochester, NY, United States, ⁴US National Toxicology Program, National Institute of Environmental Health Sciences, Research Triangle Park, NC, United States, ⁵Existing Substance & Risk Assessment Bureau, Health Canada, Ottawa, ON, Canada, ⁶New Substances Assessment & Control Bureau, Health Canada, Ottawa, ON, Canada, ⁷University of Cambridge, Cambridge, UK, ⁸United States Environmental Protection Agency, Research Triangle Park, NC, United States.

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A Weight of Evidence Approach to Assess the Genotoxicity of Chinese Goldthread, a Botanical Extract. Sun B¹, Mahony C², Allemang A³, Pfuhrer S³. ¹New Chapter, Inc., Brattleboro, VT, United States ²The Procter & Gamble Co., Greater London Innovation Centre, Egham UK, ³The Procter & Gamble Co., Mason, OH, United States.

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Developing In Vitro Alternatives to the In Vivo Genotoxicity Assessments: CometChip™, MN and TgX DDI in HepaRG Cells and Hepatocytes. Recio L¹, Swartz C¹, Sly J¹, Martin L¹, Rivas M¹, Owiti N², Kaushal S², Buick J³, Cho E³, Williams A³, Gagné R³, Engelward B², Yauk CL³. ¹ILS, Research Triangle Park, NC, United States, ²MIT, Cambridge, MA, United States, ³Health Canada, Ottawa, ON, Canada.

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Pig-a Mutations Detected in Bone Marrow Erythroid Cells of Rats Treated with DMBA. Dobrovolsky V, Dad A, Pearce M, Revollo J. National Center for Toxicological Research/US FDA, Jefferson, AR, United States.

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Systematic Evidence Mapping for Updating Health Reference Values: A Case Example Using Acrolein. Keshava C¹, Davis A¹, Stanek J¹, Thayer K¹, Galizia A¹, Keshava N¹, Gift J¹, Vulimiri SV¹, Woodall G¹, Gigot C¹, Greenhalgh A¹, Schult z B¹, Volkoff S², Camargo K³, Persad AS¹. ¹National Center for Environmental Assessment, US Environmental Protection Agency, NC, United States, ²Duke University, Durham, NC, United States, ³Texas A&M University, College Station, TX, United States.

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Collaborative Efforts to Develop Adverse Outcome Pathways: Oxidative DNA Damage Leading To Chromosomal Aberrations And Mutations. Cho E^{1,2}, Allemang A³, Audebert M⁴, Chauhan V⁵, Dertinger S⁶, Hendriks G⁷, Luijten M⁸, Marchetti F^{1,2}, Peel L⁹, Pfuhrer S³, Roberts DJ¹⁰, Trezz K¹¹, Yauk CL^{1,2}. ¹Environmental Health Science and Research Bureau, Health Canada, Ottawa, ON, Canada, ²Carleton University, Ottawa, ON, Canada, ³The Procter & Gamble Company, Mason, OH, United States, ⁴Toxalim, Université de Toulouse, INRA, Toulouse, France, ⁵Consumer and Clinical Radiation Protection Bureau, Health Canada, Ottawa, ON, Canada, ⁶Litron Laboratories, Rochester, NY, United States, ⁷Toxys, Leiden, The Netherlands. ⁸Centre for Health Protection, National Institute for Public Health and the Environment (RIVM), Bilthoven, The Netherlands, ⁹Health and Environmental Sciences Institute, Washington, D.C., United States, ¹⁰Charles River Laboratories, Skokie, IL, United States, ¹¹Boehringer-Ingelheim, Ingelheim, Germany.

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The Mutagenic Activity of Select Azo Compounds in MutaMouse Target Tissues in vivo and Primary Hepatocytes in vitro. Cox J, White P. Environmental Health Science and Research Bureau, Health Canada, Ottawa, ON, Canada.

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Utilization of High Throughput Screening (HTS) Tools to Explain the Mechanism of Misleading in vitro Positive Outcomes: A Case Study. Thakkar Y, Joshi K, Api AM. Research Institute for Fragrance Materials Inc., Woodcliff Lake, NJ, United States.

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A Metabolic Competent 3D Liver Sandwich Model Co-Culture With Human Lymphoblast: Application in the Comet and Micronucleus Assay. Registre M, Zaroni BT, Hamel A, Cardoso R. Charles River Laboratories Montreal, QC, Canada.

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Effect of Aging on the Repeated Dose Liver Micronucleus Assay. Hamada S¹, Shigano M¹, Nakadate K¹, Takasawa H¹, Honma M². ¹LSI Medience Corporation, Kamisu, Tokyo, Japan ²National Institute of Health Sciences, Kamiyoga, Tokyo, Japan.

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Influence of Lactation on Micronucleus and Pig-a Mutation Assessments Integrated into Developmental Reproductive Toxicity Studies. Hobbs CA¹, Rauer A¹, Recio L¹, Torous DK², Avlasevich SL², Dertinger SD², Witt KL³. ¹Integrated Laboratory Systems, Inc., Research Triangle Park, NC, United States, ²Litron Laboratories, Rochester, NY, United States, ³National Toxicology Program, NIEHS, Research Triangle Park, NC, United States.

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Microplate Agar (MPA) as a Tool for the Mutagenic Characterization of Dyes Using a More Efficient Strain Battery. Umbuzeiro GA^{1,2}, Morales DA¹, Vacchi FI¹, Albuquerque AF¹, Sui X², M Szymczyk², Vinueza N², Freeman HS². ¹UNICAMP, Campinas, SP, Brazil, ²Wilson College of Textiles, North Carolina State University, Raleigh, NC, United States.

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Validation of the γ H2AX Biomarker for Genotoxicity Assessment: A Review. Audebert M¹, Kopp B^{1,2}, Khoury L³. ¹Toxalim, Toulouse, France. ²ANSES, Fougères, France ³PrediTox, Toulouse, France.

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Determining Mutagenicity of Benzo[a]pyrene and Nitrofurantoin by Whole Genome Sequencing of Pooled Clones. Alund AW¹, Pan, BH¹, Yan, J¹, Chen, Y¹, Robison TW², Heflich, RH¹, Chen, T¹. ¹National Center for Toxicological Research, US Food and Drug Administration, Jefferson, AR, United States. ²Center for Drug Evaluation and Research, US Food and Drug Administration, Silver Spring, MD, United States.

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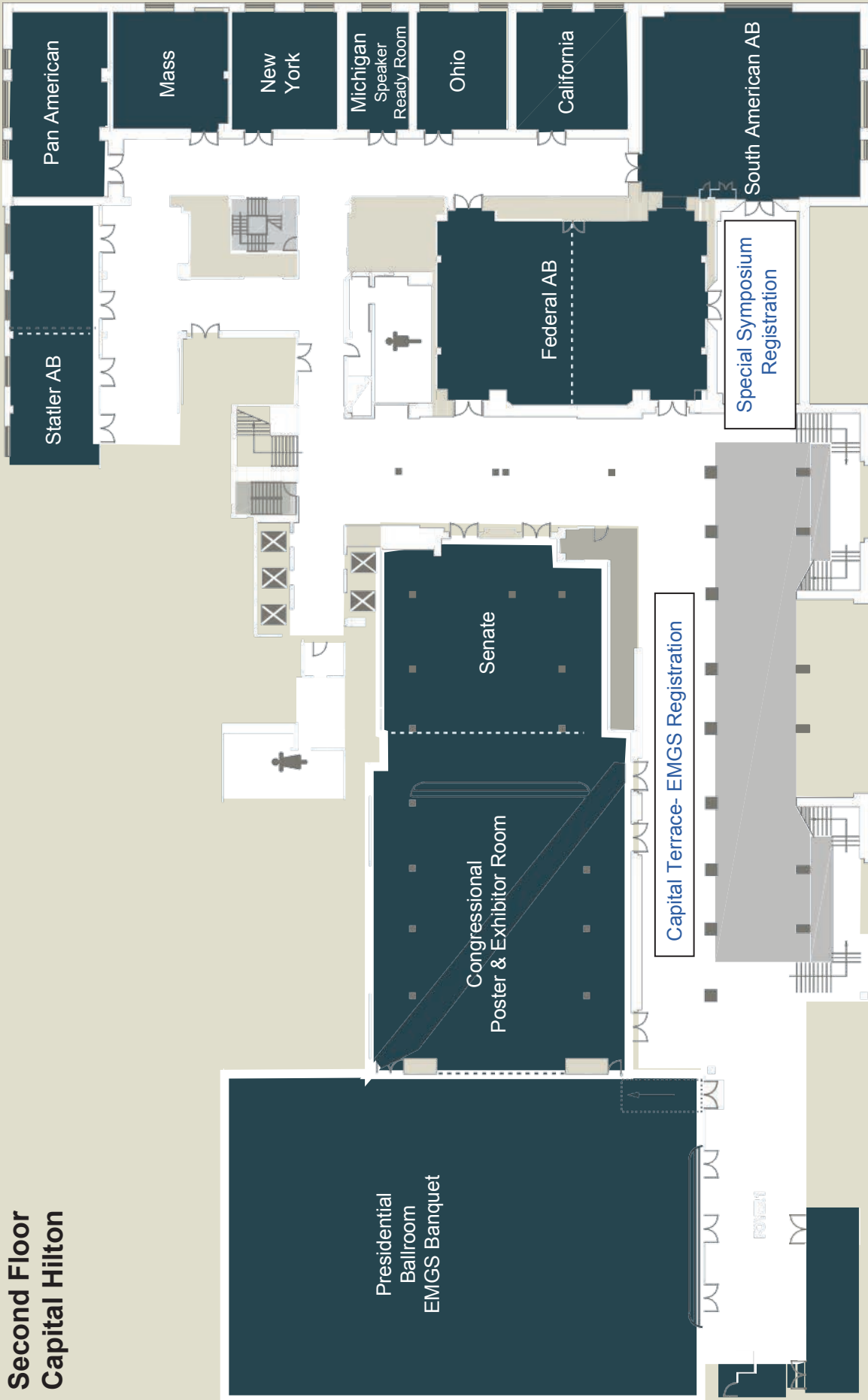
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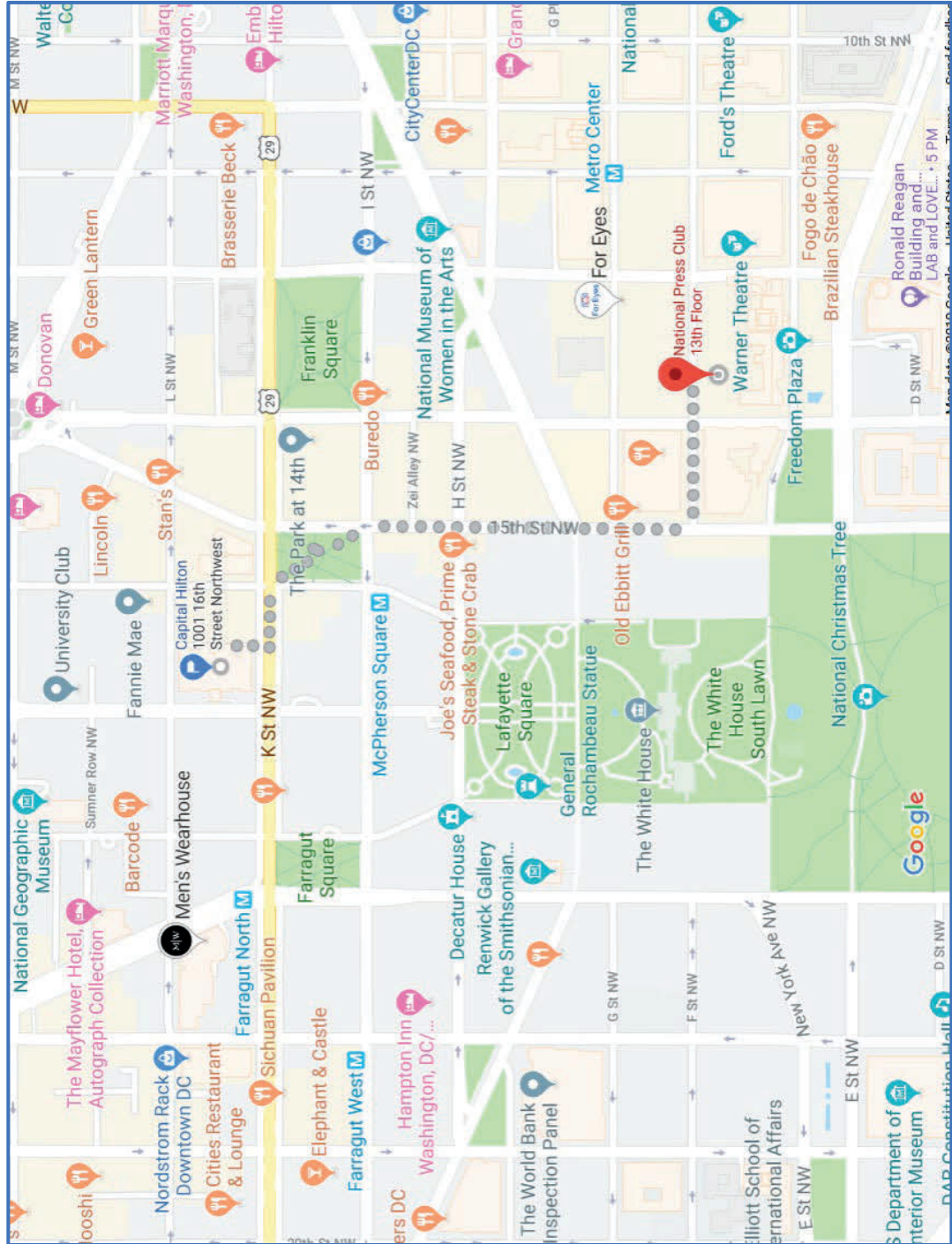
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Novel Base Excision Repair Function of RECQ1 in Euchromatin Beyond Replication and Double Strand Break Repair. Roy R¹, Basu NK¹, Gao B¹, Lan L², Sobol R³, Glasgow E¹. ¹Georgetown University Medical School, Washington, DC, United States, ²Massachusetts General Hospital Cancer Center, Harvard Medical School, Charlestown, MA, United States, ³University of South Alabama, Mitchell Cancer Institute, Mobile, AL, United States.

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Comparison of the Genotoxicity of Glyphosate, (Aminomethyl)phosphonic Acid, and Glyphosate Based Formulations Using In Vitro Approaches. Swartz CD¹, Christy NC¹, Sly JE¹, Witt KL², Smith-Roe SL². ¹Integrated Laboratory Systems, Inc., Research Triangle Park, NC, United States, ²NIEHS, Research Triangle Park, NC, United States.

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Pre-validation Studies of the CometChip Assay for Genotoxicity Testing. Owiti NA¹, Kaushal S¹, Ngo LP¹, Martin L², Sly J², Recio L², Engelward BP¹. ¹Massachusetts Institute of Technology, Cambridge, MA, United States, ²Integrated Laboratory Systems, Research Triangle Park, NC, United States.

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The Fate of Cells that Escape Cr(VI)-induced Cell Death. Wise SS, Daniel S, Wise, Sr. JP. Wise Laboratory of Environmental and Genetic Toxicology, University of Louisville, Louisville, Kentucky United States.

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Time-Lapse Crystallography Snapshots of a Double Strand Break Repair Polymerase Inserting an Oxidized Nucleotide. Jamsen JA¹, Sassa A², Shock DD¹, Beard WA¹, Wilson SH¹. ¹Genome Integrity and Structural Biology Laboratory, National Institute of Environmental Health Sciences, National Institutes of Health, Research Triangle Park, NC, United States. ²Laboratory of Chromatin Metabolism and Epigenetics, Graduate School of Science, Chiba University, Chiba, Japan.

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The CometChip: a High Throughput Comet Assay Capable of Detecting DNA Strand Breaks. Kaushal S, Owiti NA, Ngo LP, Samson LD, Engelward BP. Massachusetts Institute of Technology, Cambridge, MA, United States.

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The Vulnerability of the Germline: Epigenetic Responsibility. Le Goff A, Landecker H, Allard P. University of California Los Angeles, CA, United States.

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Thirdhand Smoke Exposure Impairs DNA Replication and Transcription in Human Lung Cells. Sarker AH, Trego K, Zhang W, Snijders A, Mao J-H, Schick SF, Cooper PK, Hang B. Lawrence Berkeley National Laboratory, Berkeley, CA, United States.

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Analysis of Genetic Susceptibility Factors for N-nitrosamine-Induced Genomic Instability and Cancer. Kay JE, Corrigan JJ, Kiraly O, Samson LD, Engelward BP. Massachusetts Institute of Technology, Cambridge, MA, United States.

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Global and Genome-Wide Methylation in Newborns From Diverse Air Polluted Localities in the Czech Republic. Topinka J, Honkova K, Vrbova K, Rössnerová A, Rossner P, Sram RJ. Institute of Experimental Medicine CAS, Prague, Czech Republic.

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Effects of Chronic Cannabidiol (CBD) Exposure on Maternal Behavior, DNA Methylation, and Offspring Coat Color in the Agouti Viable Yellow (Avy) Environmental Biosensor Model. Wanner NM, Colwell M, Faulk C. ¹University of Minnesota, Saint Paul, MN, United States.

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Pre-pregnancy BMI Is Associated With Differential Expression Of Placental MicroRNAs. Clark, JS, Rager JE, Smeester L, Santos Jr. HP, O'Shea TM, Fry RC. University of North Carolina, Chapel Hill, North Carolina, United States.

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Histone H1.5 Binds Over Splice Sites in Chromatin and Regulates Alternative Splicing. Glaich O, Leader Y, Maor GL, Ast G. Tel Aviv University, Tel Aviv, Israel.

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Variable Mutagenesis by Alkylating Agents Observed in Human Cancer, Animal Models and Cell Lines. Zhivagui M¹, Renard C², Vilalta P³, Balbo S³, Ludmil AB¹, Zavadil J². ¹University of California San Diego, La Jolla, CA, United States, ²International Agency for Research on Cancer, Lyon, France, ³University of Minnesota Masonic Cancer Center, Minneapolis, MN, United States.

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Evaluation of NNK Genotoxicity in Multiple Assay Systems. Mittelstaedt RA, Dad A, Guo X, Seo J-E, Revollo, JR, Yucesoy, B, Rosenfeldt, H, Heflich, RH. US Food and Drug Administration, Jefferson, AR, United States.

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Non-B DNA Structures and Mutagenesis in the Human zgermline. McGinty R, Sunyaev S. Harvard Medical School, Boston, MA, United States.

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SIG Updates. Klein, CB¹, Yauk, CL², Myers, MB³, Poirier, MC⁴. ¹NYU School of Medicine, New York, NY, United States, ²Environmental Health Science and Research Bureau, Health Canada, Ottawa, Ontario, Canada, ³National Center for Toxicological Research, US FDA, Jefferson, AK, United States, ⁴Scientist Emeritus, National Cancer Institute, NIH, Bethesda, MD, United States.

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Data Mining the Catalogue of Somatic Mutations in Cancer to Design an Error-Corrected NGS Panel for Therapy-Related Myeloid Neoplasm Risk. Myers MB, Parsons BL. US Food and Drug Administration, National Center for Toxicological Research, , Jefferson, AR, United States.

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Considerations in Addressing Irrelevant or False Positive Genotoxicity Results During Drug Development: Regulatory Consultant's Perspective. Krishna G, Huang, Z. Parexel International, Bethesda, MD, United States.

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The Basic Data for the RBC Pig-a Assay and PIGRET Assay (HIS49/CD59 Method). Chikura S, Kimoto T, Okada Y, Okada K, Morishima R, Miura D. Teijin Pharma Limited, Tokyo, Japan.

Flash Talks Session 1
Chairperson: Mitchell Turner

Circadian Clock Disruption Impairs the Skin's DNA Damage Response to Solar UVB and Increases Mutagenicity. (P25)

Panshak Dakup, Washington State University

Drug-induced Replication Stress Promotes Mutagenic DNA Repair and Genome Instability in Mammalian Genomes.

Sheroy Minocherhomji, Amgen

UV-DDB: An Early Responder in the Repair of Oxidative DNA Damage.

Namrata Kumar, University of Pittsburgh

Assessing Formaldehyde-induced Hematopoietic Stem Cell Toxicity Derived from BALB/c Mouse Lungs and Nose *ex vivo*.

Laura Magaña, University of California, Berkeley

Microplate Agar (MPA) as a Tool for the Mutagenic Characterization of Dyes Using a more Efficient Strain Battery.

Gisela Umbuzeiro, UNICAMP

Machine Learning – Digital Signal Processing and Genomic Signatures to Elucidate the Ancestral Proteobacterial Origin of Mitochondria.

Maximillian Soltysiak, University of Western Ontario

Thirdhand Smoke Exposure Impairs DNA Replication and Transcription in Human Lung Cells.

Altaf Sarker, Lawrence Berkely National Laboratory

Death by dGTP Starvation

Roel Schaaper, NIEHS

Loss-of-function Mutations in LRRK2 Identify a Subset of Invasive Mammary Carcinomas with Distinct Morphology, Aggressive Behavior and High Mutational Burden.

Laurie Sanders, Duke University

Non-Canonical Characteristics of Mutational Signatures Identified by Experimental Modeling.

Jiri Zavadil, International Agency for Research on Cancer

Utilization of High Throughput Screening (HTS) Tools to Explain the Mechanism of Misleading *in vitro* Positive Outcomes: A Case Study.

Yax Thakkar, Research Institute for Fragrance Materials Inc.

Environmental Exposures and Omics Research in Pregnant Women and Children: from Metabolomics to DNA Methylation.

Gwen Tindula, University of California, Berkeley

Flash Talks Session 2
Chairperson: Barbara Parsons

A Stand-Alone Software Tool with a Graphical User Interface Employing Machine-Learning and Digital Signal Processing (ML-DSP) for Accurate Genome-Wide Classification of Human Mitochondrial Diseases and Cancer Types.

Gurjit Randhawa, University of Western Ontario

Robust Experimental and Computational Methods for In-Depth Characterization of Mutational Signatures.

Steven G. Rozen, Duke University

The Vulnerability of the Germline: Epigenetic Responsibility.

Anne Le Goff, UCLA

The Lagging Strand is More Accurate but Lives Dangerously.

Roel Schaaper, NIEHS

Considerations in Addressing Irrelevant or False Positive Genotoxicity Results During Drug Development: Regulatory Consultant's Perspective.

Gopala Krishna, PAREXEL International

Experimental Models Elucidate the Relationship Between Genetic and Epigenetic Alterations During Carcinogen-mediated Cell Transformation.

Michael Korenjak, International Agency for Res. on Cancer

Effect of Aging on the Repeated Dose Liver Micronucleus Assay.

Shuichi Hamada, LSI Medience Corporation

Evaluating Non-Covalent DNA-Binders in the MultiFlow Assay.

Dan Roberts, Charles River Laboratories

Characterizing the Role of TDP1 During Development in *Drosophila Melanogaster*.

Vada Becker, Northeastern Illinois University

The Role of Werner Protein in Responding to Oxidative Stress in *Drosophila Relanogaster*

Derek Epiney, Northeastern Illinois University

Variation in Signatures of Cadmium-induced Mitochondrial DNA Mutations Reveal Evolutionary Effects of Pollution.

Tess Leuthner, Duke University

DNA Methylation Patterns in *Fundulus heteroclitus* Exposed to Power Plant Thermal Effluent.

Melissa Drown, University of Minnesota



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William Kaufmann, PhD
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KEYNOTE SPEAKERS

Mary-Claire King, PhD
Professor of Genome Sciences and Medicine
University of Washington

Trey Ideker, PhD
Professor in the Departments of Medicine, Bioengineering and
Computer Science, UC San Diego

Joan A. Steitz, PhD
Sterling Professor of Molecular Biophysics and Biochemistry
Yale School of Medicine

Kari Stefansson, M.D.
Dr. Med. CEO of deCODE Genetics

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