National Institute of Environmental Health Sciences

# Workshop on New Approaches for Detecting Environmentally-induced DNA Damage and Mutation in Population Studies

## June 11-12, 2015

NIEHS Building 101, Rodbell AB
111 TW Alexander Drive, Research Triangle Park, N.C.

The purpose of this workshop is to bring together developers of tools and methods for measuring DNA repair capacity, DNA damage, and DNA mutations linked to environmental stressors with population and clinical researchers to provide guidance for new, translational directions. The panel will consider the practical issues and roadblocks to applying new approaches to studies of environmentally-related diseases and recommend solutions. The panel will also discuss strategies for increasing collaborations among basic and population-based researchers.

## Agenda

**Thursday, June 11**

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| 8:30 a.m. | **Introduction**<br>*Gwen Collman, Director, Division of Extramural Research and Training, NIEHS* |
| 8:40 a.m. | **Charge for the Meeting**<br>*Dan Shaughnessy, Exposure, Response, and Technology Branch, DERT, NIEHS* |
| ***Session One:*** | ***New Approaches for Detecting DNA Damage***<br>*Moderator – Guo-Min Li, University of Kentucky* |
| 8:45 a.m. | **Overview: Applying New Tools for Assessing DNA Damage and Response in Human Populations**<br>*Leona Samson, Massachusetts Institute of Technology* |
| 9:15 a.m. | **Higher Throughput Comet Assay Enables Population Studies for DNA Repair Capacity**<br>*Bevin Engelward, Massachusetts Institute of Technology* |
| 9:30 a.m. | **Quantitative Real-time DNA Repair Analysis Tools**<br>*Robert Sobol, University of South Alabama* |
| 9:45 a.m. | **Fluorescence-based Host Cell Reactivation Assays for Measuring DNA Repair Capacity in Human Populations**<br>*Zac Nagel, Massachusetts Institute of Technology* |
| 10:00 a.m. | BREAK |
| 10:15 a.m. | **High Throughput Measurement of DSB Repair Kinetics in Healthy or Exposed Human Populations**<br>*David Brenner, Columbia University* |

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| 10:30 a.m. | **Leukocytes From Patients Undergoing Diagnostic Computed Tomography (CT) Scans Can Be Used to Validate New Technologies That Measure the DNA Damage Response**<br>*Thomas Begley, SUNY Albany* |
| 11:00 a.m. | Discussion |
| 11:30 a.m. | Lunch – NIEHS Cafeteria |
| ***Session Two:*** | ***Novel Approaches for Mutation Detection***<br>*Moderator – Kim McAllister, Genes, Environment, and Health Branch, DERT, NIEHS* |
| 12:30 p.m. | **Analysis of Somatic Mutations and Epimutations by Direct Sequencing**<br>*Jan Vijg, Albert Einstein College of Medicine* |
| 1:00 p.m. | **High-fidelity Characterization of Targeted and Genome-wide Mutagenesis at Single Molecule Resolution**<br>*Jason Bielas, Fred Hutchinson Cancer Research Center* |
| 1:30 p.m. | Discussion |
| ***Session Three:*** | ***DNA Repair Capacity and Mutation Detection in Human Population Studies***<br>*Moderator – Caroline Dilworth, Population Health Branch, DERT* |
| 2:00 p.m. | **DNA Damage/Repair in Human Cancer Risk**<br>*Jennifer Hu, University of Miami* |
| 2:30 p.m. | **The Host Cell Reactivation DNA Repair Assay in Risk of Smoking-related Cancers**<br>*Qingyi Wei, Duke University* |
| 2:45 p.m. | **Translation Relevance of the DNA Repair Assays**<br>*Margaret Spitz, Baylor College of Medicine* |
| 3:15 p.m. | BREAK |
| 3:30 p.m. | **DNA Repair, Environment, and Family-based Studies**<br>*Mary Beth Terry, Columbia University* |
| 4:00 p.m. | **A Cancer Susceptibility Allele, Cell Cycle Regulation and Genomic Instability: From Epidemiology to Mouse Models to Mechanisms Of Disease**<br>*Peter Stambrook, University of Cincinnati* |
| 4:30 p.m. | Discussion of the Day's Highlights |
| 5:00 p.m. | Adjourn |

| **Friday, June 12** | |
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| 8:30 a.m. | Closed Panel Discussion |
| 10:00 a.m. | BREAK |
| 10:15 a.m. | Closed Panel Discussion |
| Noon | Adjourn |