ONE HEALTH ONE PLANET™
SPEAKER BIOS AND PRESENTATION ABSTRACTS
Phipps Conservatory and Botanical Gardens

Opening Reception and Keynote
Wed., March 7 | 5 – 9 p.m.

Introduction: Terrence J. Collins, Ph.D.
Teresa Heinz Professor of Green Chemistry | Carnegie Mellon University

Toward Protecting Our Health and Preventing Today's Epidemics of Chronic Diseases and Disabilities
Pete Myers, Ph.D.
Founder, CEO and Chief Scientist | Environmental Health Sciences

John Peterson "Pete" Myers is founder, CEO and chief scientist of Environmental Health Sciences, a not-for-profit organization that promotes public understanding of advances in scientific research on links between the environment and human health. Dr. Myers holds a doctorate in biological sciences from the University of California, Berkeley and a B.A. from Reed College. For a dozen years beginning in 1990, Dr. Myers served as director of the W. Alton Jones Foundation in Charlottesville, VA. Along with co-authors Dr. Theo Colborn and Dianne Dumanoski, Myers wrote *Our Stolen Future* (1996), a book that explores the scientific basis of concern for how contamination threatens fetal development. Dr. Myers is now actively involved in primary research on the impacts of endocrine disruption on human health. He is on the management team of the Fan Initiative and is on the boards of the Science Communication Network and the Jenifer Altman Foundation. Until its merger with Pew Charitable Trusts in 2007, he served as board chair of the National Environmental Trust. He has also served as board president of the Consultative Group on Biological Diversity — an association of more than forty foundations supporting work on biodiversity, climate, energy and environmental health — and board chair of the H. John Heinz Center for Science, Economics and the Environment. He is an adjunct professor of chemistry at Carnegie Mellon University.

Dr. Myers lectures around the world. In 2016 he received a Laureate Award for Outstanding Public Service from The Endocrine Society, the world's largest association of medical and research professionals specializing in endocrinology. In November 2016 he received, along with 11 others, the first Champion of Environmental Health Research award from the National Institutes of Health. Other recipients included three current or former directors of the National Institute of Environmental Health Sciences.

Abstract: We live a much changed health landscape, dominated by epidemics of chronic diseases and disabilities. Many of these conditions arise from dysfunctions in endocrine signaling, often with roots early in development. Research over the past three decades has brought increasing attention to the causal role of endocrine disrupting chemicals in disease etiology. That points towards important opportunities to reduce disease burdens by reducing exposures, and a key part of those opportunities is helping chemists make money by designing inherently safer materials.

One Health One Planet Symposium
Thurs., March 8 | 8 – 5 p.m.

Session 1: Chemicals of Concern in the Environment and Subsequent Impacts on Health

8 – 8:10 a.m.
Opening Remarks
Richard Piacentini
Executive Director | Phipps Conservatory and Botanical Gardens

8:10 – 8:40 a.m.
One Toxicology — Domestic and Wild Animals are Sentinels for Human Beings (But Only When They Exist and Are Carefully Observed)
Val Beasley, D.V.M., Ph.D., Dipl. A.B.V.T.
Professor of Veterinary, Wildlife and Ecological Toxicology | Pennsylvania State University

Val Beasley earned a D.V.M. from Purdue University and was a small animal practitioner for six years in New Jersey and Ohio. After completing a residency and Ph.D. in toxicology, he continued on the faculty of the College of Veterinary Medicine, University of Illinois. He taught toxicology and pharmacology courses, helped start the first animal poison control center, led research on mycotoxins, cyanobacterial toxins, pesticides, heavy metals and amphibian declines, established the Envirovet program and its summer institutes, and was chair of pharmacology and toxicology. He subsequently joined Pennsylvania State University and was head of veterinary and biomedical sciences through 2016.

Abstract: Despite the rapid expansion of knowledge in biochemistry, molecular and evolutionary biology, toxicology, and diagnostic and clinical medicine, nonlethal and lethal poisonings effecting multiple species continue to result from chemical contamination of today's

indoor and outdoor environments. More effective stewardship of the health of people, domestic and wild animals, domestic and wild plants, soils and ecosystems (One Health) depends on understanding, diagnosing, and avoiding impacts of harmful chemicals across the species continuum (One Toxicology). Three examples illustrate ongoing challenges and opportunities for the future. Mercury impacts both wildlife and fish-eating people. Insecticide poisonings of birds were central to the environmental movement that began in the 1960s. Subsequent banning of harmful products reduced some risks, but the insecticides that dominate today's agricultural markets continue to undermine bird populations. Flame retardants that were introduced to products in the 1970s are in outdoor environments and our homes today—and are the most plausible cause of an epidemic of feline hyperthyroidism. Impacts on housecats, wildlife and humans are ongoing concerns. More diagnoses, more careful choices in regard to currently available chemicals and a rapid increase in reliance on green chemistry are essential for a brighter and healthier future.

8:40 – 9:10 a.m.
Beluga Whales of the St. Lawrence River, the "River Sweepers"
Daniel Martineau, D.M.V., M.Sc., Ph.D., Dipl. A.C.V.P.
Professor (retired), Department of Pathology and Microbiology, Faculty of Veterinary Medicine | Université de Montréal

Dr. Martineau's research interests focus on viral and chemical carcinogenesis in aquatic animals in relation with human health. His aim is to reduce the carcinogenic and other negative impacts of viruses and chemicals on fish, cetaceans and ultimately on humans. More than 30 years ago, he established a program — still ongoing — to determine the causes of death of beluga whales inhabiting the St Lawrence Estuary (Quebec, Canada), the southernmost population of that species. Over the years, with many collaborators, he found that these endangered animals suffer a very high prevalence of cancer and that they are contaminated with polycyclic aromatic hydrocarbons (PAHs), carcinogenic compounds which are probably ingested through the contaminated invertebrates that live in the sediments of that region and which released by local aluminum smelters. The results of these publications, widely communicated through the media, accelerated the closure of an aluminum smelter that was still using the antiquated and highly polluting Söderberg process. He has also made significant contributions to the study of viral carcinogenesis in fish.

Abstract: A small population of beluga whales living in the Saint Lawrence River (SLR) in Quebec, Canada, has been exposed for over 50 years to polycyclic aromatic hydrocarbons (PAHs) which have been released massively into the environment by a local aluminum smelter. Since 1982, we have found a high rate of gastrointestinal tract (adeno) carcinomas in SLR beluga. In parallel, in people, high rates of urinary, lung and bladder cancers have been epidemiologically associated with working in the local aluminum smelter which used an antiquated, highly polluting process. In addition, the local population showed higher gastro-intestinal cancers rates compared to the Canadian population, possibly through PAH-contaminated surface drinking water. These observations, published in 2002, most likely contributed to the closure of the smelter in 2004, 10 years before the closure planned by the company. This closure was followed by a decrease of cancer in both local aluminum workers and in beluga.

9:10 – 9:40 a.m.
America's Next Top Model: What Do We Really Know About Her?
Tyrone Hayes, Ph.D.
Class of 43 Chair and Professor of Integrative Biology, Museum of Vertebrate Zoology, Endocrinology, Molecular Toxicology and Energy Resources Group | University of California, Berkeley

Tyrone B. Hayes was born and raised in Columbia, SC where he developed his love for biology. He received his bachelor's degree from Harvard University in 1989 and his Ph.D. from the department of integrative biology at the University of California, Berkeley in 1993. After completing his Ph.D., he began post-doctoral training at the National Institute of Child Health and Human Development, National Institutes of Health and the Cancer Research Laboratories at UC Berkeley (funded by the National Science Foundation), but this training was truncated when he was hired as an assistant professor at UC Berkeley in 1994. He was promoted to associate professor with tenure in 2000 and to full professor in 2003. Hayes' research focuses on developmental endocrinology with an emphasis on evolution and environmental regulation of growth and development. For the last 15 years, the role of endocrine disrupting contaminants, particularly pesticides, has been a major focus. Hayes is interested in the impact of chemical contaminants on environmental health and public health, with a specific interest in the role of pesticides in global amphibian declines and environmental justice concerns associated with targeted exposure of racial and ethnic minorities to endocrine disruptors and the role that exposure plays in healthcare disparities.

Abstract: The African clawed frog is the most commonly used amphibian in biological research. The species is easily bred and reared, its developmental biology and physiology is well-understood, and its genome has been sequenced. As a result, *X. laevis* has been used to examine endocrine disrupting compounds (EDCs) and often cited as the model amphibian for assessing effects of EDCs in amphibians. *X. laevis* is a very atypical anuran amphibian however: It has no tongue, it is aquatic through all life stages, it cannot jump or maneuver very well on land, it lacks vocal chords and a vocal sac, it has a pseudo-tetraploid genome and it has a unique sex-determining gene that is not even present in its closest relatives within the genus. In addition to these differences, we have identified extreme variation in response to estrogens and EDCs in this species. Different lineages (sources) of *X. laevis* can differ in their sensitivity to estrogen by a factor of 10,000. These findings call to question whether *X. laevis* is an appropriate model for predicting effects of EDCs in amphibians. Furthermore, the

response to estrogen and EDCs can change even across a single generation. Current studies explore the role of metabolism and receptor differences in this variability.

9:40 – 10:10 a.m.
Chemicals of Emerging Concern in the Aquatic Environments: Effects on Fish
Vicki Blazer, Ph.D.
Research Fish Ecologist | U.S. Geological Survey

Vicki Blazer received her Ph.D. in aquaculture, fisheries and pathology from the University of Rhode Island. After completing a postdoctoral position at the University of Georgia Veterinary College, she joined the Cooperative Fish and Wildlife Research Unit at the School of Forest Resources as the assistant unit leader. In 1992, Vicki moved to the U.S. Geological Survey's National Fish Health Research Laboratory in Kearneysville, WV. She has done fish health research nationally and internationally, recently focusing on effects of emerging contaminants in the Chesapeake and Great Lakes watersheds. Vicki is an adjunct faculty member at West Virginia University and Penn State and directs graduate student research. She has coauthored over 150 publications, is active in the fish health section of the American Fisheries Society, having served on numerous committees, and is president and editor of the Journal of Aquatic Animal Health. Vicki has won numerous awards including the AFS Snieszko Distinguished Service and Riverkeepers Protector of the Potomac.

Abstract: Chemicals of emerging concern enter the aquatic environment through both point and non-point sources. We have used adverse effects monitoring of indicator species to identify areas for more indepth studies. In the Chesapeake Bay watershed, the finding of intersex (testicular oocytes) during investigations of fish kills and chronic fish health issues raised significant concerns about the health of riverine habitats for aquatic organisms as well as the people who use these rivers for recreation and drinking water. The finding of multiple co-infections including bacterial, viral and parasitic pathogens in both adult and young-of-year smallmouth bass suggests an adverse effect of these complex mixtures of environmental stressors on disease resistance. In urban areas we observe skin, liver and testicular tumors. An integrated approach, using a suite of fish health indicators ranging from organism to molecular, monthly water contaminant analyses, chemical concentrations in tissue, population trends and geospatial analyses, is being used to identify risk factors that may inform management decisions.

10:10 – 10:25 a.m.
Coffee Break

Session 2: Additional Routes of Exposure for Humans and Animals

10:25 – 10:55 a.m.
The Fates of Endocrine Disruptors in Consumer Products: Bisphenol A
Matthew DeNardo, Ph.D.
Postdoctoral Research Associate | Carnegie Mellon Univeristy

Matthew Denardo is a postdoctoral researcher at the Institute for Green Science, which is centered at Carnegie Mellon University (CMU). His work focuses on the development and commercialization of NewTAML catalysts, which are extensively safety tested, stable, safely shipped red crystalline iron salts that, when combined with hydrogen peroxide, create 'fire in water' to burn targets at room temperature and near-neutral pH. NewTAMLs remove micropollutants from agricultural, industrial and municipal wastewaters. Matt co-invented NewTAMLs while completing his doctorate in chemistry at CMU, before which he earned a bachelor of science in chemistry with a certificate in biology at the University of Pittsburgh.

Abstract: Bisphenol A (BPA) is the signature endocrine disruptor (ED) of our day. In 2017, researchers at Carnegie Mellon University's Institute for Green Science (IGS) published a multidisciplinary review covering a wide selection of the research on BPA. The review spans the path of BPA through production and incorporation into goods, the resulting contamination of human bloodstreams and the human health impacts, and the resulting contamination of waters worldwide and the environmental impacts. In addition, the work describes an extremely simple-to-deploy, scalable method developed at the IGS for removing BPA from water with extremely high environmental and technical performances. This presentation will summarize key elements of the IGS review article in a friendly graphical format. The talk is designed to demonstrate the incorporation of EDs into consumer products, the consequences of these EDs, the available methods for avoiding the production of ED-containing goods, and the IGS developed methodology for removing the EDs from waters.

10:55 – 11:25 a.m.
The Red List: A Case for Healthy Building Products
Richard Piacentini, WELL AP
Executive Director | Phipps Conservatory and Botanical Gardens
Since 1994, **Richard Piacentini** has led the green transformation of Phipps Conservatory and Botanical Gardens, including construction of the Center for Sustainable Landscapes, the only building in the world to meet: the Living Building Challenge™, LEED® Platinum, WELL™ Platinum, and 4 Stars Sustainable SITES™ certifications. Richard is interested in the important connection between people and plants

particularly as it relates to human and environmental health. He serves as past Chair of the International Living Future Institute™ (ILFI) and is a past president of the American Public Gardens Association. He has received numerous professional honors, including ILFI and USGBC leadership awards.

Abstract: We spend over 90% of our lives in buildings, so what happens within their walls can have a significant impact on our health. Toxic chemicals in building products can affect people at every point of the building process, from production and construction to end use and disposal. The Living Building Challenge™, launched in 2006 by the International Living Future Institute (ILFI), is a green building certification program that defines the most advanced measure of sustainability in the built environment. The ILFI has developed a Red List of chemicals that may not be included in any materials used in construction for any building trying to meet the criteria of the Living Building Challenge. These are chemicals that can pollute the environment, bio-accumulate up the food chain until they reach toxic concentrations, or harm construction and factory workers. The Red List directly addresses the often undisclosed, dangerous chemicals hidden in the building materials of modern homes, schools, hospitals and offices. The list includes neurotoxins, carcinogens and endocrine disruptors, which play a role in a number of today's increasing health problems. Another ILFI program, Declare, offers an ingredients list for products and product database. Together, the Red List and Declare programs can help end users make smart decisions. They also serve as advocacy tools by encouraging manufacturers to be conscious of and transparent about the ingredients they use in their products. The Red List and Declare should be essential components of all building projects, especially those intended for children.

11:25 – 11:55 a.m.
We Are What We Eat: Non-stick Chemicals, Plasticizers and Other Contaminants in Our Food and Our Bodies
Alexis Temkin, Ph.D.
Toxicologist, Environmental Working Group

Alexis Temkin, originally from Chappaqua, NY, recently moved to Washington, D.C. to join the investigative science team at Environmental Working Group as their toxicologist. She earned her bachelor's degree in biological sciences from Connecticut College in 2010, then began her research career at Columbia University Medical Center working as a lab technician studying the molecular mechanisms responsible for environmental influence on gene regulation. She then moved to beautiful Charleston, SC to attend the Medical University of South Carolina where she earned a Ph.D. in Marine Biomedicine and Environmental Sciences, studying how exposure to environmental chemicals during development can influence adult disease development, specifically obesity and metabolic syndrome. In her spare time, you can probably find Alexis in a yoga studio, exploring the closest outdoor park, attending a dance performance or cooking vegetables.

Abstract: Every day, American children and adults ingest complex, largely uncharacterized mixtures of chemicals intentionally included as additives in food products, sprayed on the fields where produce grows, used in food packaging or present in the environment as legacy contaminants. It is estimated that as many as 10,000 different food additives may be found in food sold in the United States. Many people are surprised to find that under the existing Food and Drug Administration framework, many of these substances have not been fully evaluated for safety. Accidental contamination of foods with chemicals like phthalates, perchlorate, bisphenols and poly and per fluorinated compounds (PFAS) can occur by migration of food contact materials from packaging and from processing and production of packaged foods. While the evidence of food contamination can be disconcerting and at times overwhelming, exposure reduction studies indicate there are effective actions families and individuals can take to reduce their exposure. To ensure that our food quality regulations are in line with the latest science, full disclosure of all ingredients and in-depth safety testing of each and every substance that comes in contact with food are essential.

11:55 a.m. – 1 p.m.
Boxed Lunch

Session 3: The Human Health Impacts of Chemical Exposures: A Focus on Endocrine-Disrupting Chemicals

1 – 1:30 p.m.
Altering the Fetal Hormonal Environment: Endocrine Disruption and Male Reproductive Development
Shanna Swan, Ph.D.
Professor of Environmental Medicine and Public Health | Icahn School of Medicine at Mount Sinai

Shanna H. Swan received a Bachelor of Arts in mathematics from the City University of New York, an M.S. in biostatistics from Columbia University and a Ph.D. in statistics from the University of California Berkeley. Shanna spent 18 years working for the California Department of Health Services, where she responded to community concerns about toxic exposures and their reproductive effects by conducting studies to address those concerns. After serving on the National Academy of Science Committee on Hormonally Active Agents in the Environment, Shanna left government service to pursue an academic career. Her work at that time focused on the question of declining sperm count, an interest that she has pursued over the past 20 years, most recently with the publication in 2017 of the most comprehensive and definitive study to date on this question. In the intervening years, she simultaneously conducted large pregnancy cohort studies to examine the developmental effects of widespread exposure to nonpersistent pollutants (such as plasticizers)

and, more recently, over-the-counter analgesics. Her research focuses on the effects of prenatal exposure to these chemicals on reproduction and neurodevelopment, with a particular interest in sexually dimorphic endpoints and identification of the critical windows during which these developing systems are most sensitive to disruption. Since 2011 she has been professor of environmental medicine and public health at the Icahn School of Medicine at Mount Sinai, New York, NY.

Abstract: A myriad of consumer products, from toys to cosmetics to pills contain one or more of the chemicals known as anti-androgens (chemicals that can interfere with testosterone synthesis and transport), which can radically alter the fetal hormonal environment. Shanna Swan has studied the consequences of early exposure to a class of anti-androgens known as phthalates, which is found in our food, our homes and, as a result, in all of us. Her research was the first to find an association between higher phthalate levels in pregnant women and altered genital development in their infant sons. During the years that production of these and other endocrine disrupting chemicals has increased, male reproductive health has declined, with Dr. Swan's recent study showing more than a 50% decline in sperm count over the past 40 years. She will present these studies and speak about some plausible implications of these findings for future population health.

1:30 – 2 p.m.

Placental Hormones: A Short-term Alert System to the Long-term Health Consequences of Chemical Exposures in Pregnancy?

Jennifer Adibi, M.P.H., Sc.D.

Assistant Professor of Epidemiology, Department of Obstetrics/Gynecology and Reproductive Sciences | University of Pittsburgh Graduate School of Public Health

Dr. Jennifer Adibi is an environmental and reproductive epidemiologist with training in placental and stem cell biology. She holds degrees from Brown University, the Columbia University Mailman School of Public Health, the T.H. Chan Harvard School of Public Health and post-doctoral training at the University of California, San Francisco. The focus of her interdisciplinary research is to probe the molecular and temporal bases by which endocrine disrupting chemicals in pregnant women may be influencing child health outcomes. She is an assistant professor in the University of Pittsburgh Graduate School of Public Health. Dr. Adibi and colleagues are currently launching a study in Pittsburgh which will grant an unprecedented opportunity to increase our understanding of endocrine disruption in the early stages of pregnancy, called Placentas, Early Exposures, and healthy Kids (PEEK). In this study, we will advertise broadly to recruit women when they miss their period and before they initiate prenatal care to measure exposure levels and hormonal profiles at multiple time points in early pregnancy during the period of organogenesis.

Abstract: We are 55 years post-*Silent Spring*, and several decades into robust inquiry on the health consequences of environmental exposures. Despite this, the status quo — universal exposure to phthalates and other endocrine disrupting chemicals — remains unchanged. Phthalates are related to adverse child health outcomes; the how, when and why of this fact remains unclear. The placenta, a fetal organ supporting the growth of the baby, is helping us to better understand early pregnancy in order to improve reproductive health at the population level. We have identified an association between a placental hormone and phthalate exposure in three independent studies, and we have used in vitro methods to confirm the causal basis of this association. We are extending this relationship forward in time to quantify effects on child reproductive and neurologic development. These data will lay a foundation for efforts to better assess environmental risks in pregnancy and modify exposures in this short but critical window.

2 – 2:30 p.m.

Effects of Prenatal Obesogen Exposure Echo Down the Generations

Bruce Blumberg, Ph.D.

Professor, Developmental and Cell Biology, School of Biological Sciences | University of California, Irvine

Bruce Blumberg received a Ph.D. from UCLA in 1987 where he studied the molecular biology and biochemistry of basement membranes. His postdoctoral training was in the molecular embryology of vertebrate development with Eddy De Robertis at UCLA from 1988 – 1992. Dr. Blumberg trained in molecular endocrinology at the Salk Institute for Biological Studies, joining the laboratory of Ronald M. Evans as a staff scientist in 1992. There he led the effort to identify new hormones that act through so-called orphan nuclear receptors. Dr. Blumberg joined the faculty at U.C. Irvine in 1998 where he is currently professor of developmental and cell biology, pharmaceutical sciences and biomedical engineering. The Blumberg laboratory studies the biology of nuclear hormone receptors in development, physiology and disease. Particular interests concern the early patterning of the vertebrate nervous system and the links between exposure to environmental endocrine disrupting chemicals and the development of cancer and obesity. He proposed the obesogen hypothesis, which holds that exposure to chemical obesogens is an important factor predisposing individuals to weight gain and obesity. His laboratory showed that exposure to obesogenic chemicals leads to increased adiposity in vivo and that many candidate obesogens can induce stem cells and preadipocytes to differentiate into adipocytes in vitro. His laboratory recently demonstrated that maternal obesogen exposure leads to epigenomic changes that can be transgenerationally inherited through at least the F4 generation, predisposing exposed animals to obesity and modifying individual response to diet.

Abstract: Obesity is most commonly ascribed to an imbalance between caloric intake and energy expenditure — the so-called thermodynamic, or "calories in – calories out" model. However a growing body of evidence points strongly toward the contributions of

other factors in the obesity epidemic. A recent meta-analysis of diet and exercise habits based on data from the National Health and Nutrition Examination Study (NHANES) showed that for the same caloric input and energy expenditure, the average person had a body mass index (BMI) 2.3 kg/m^2 higher in 2006 than in 1988, demonstrating that the energy balance model is insufficient to explain the rise in BMI during this time period. We previously showed that in utero exposure of pregnant F0 mice to the obesogen tributyltin (TBT) led to increased white adipose depot weight, increased hepatic fat storage and a bias of mesenchymal stem cells toward the adipogenic fate and away from the osteogenic fate through the F3 generation. In a replicated transgenerational study, we found that exposure of F0 animals to TBT throughout pregnancy and lactation predisposed male F4 descendants of TBT-treated animals to weight gain and obesity when challenged with a higher fat diet later in life. Moreover, the TBT group showed impaired ability to mobilize fat during periods of fasting, accompanied by elevated serum levels of leptin. Limited fat mobilization and elevated leptin levels suggest that fat accumulation results, in part, from leptin resistance. These are hallmarks of the "thrifty phenotype" in which an individual stores more of the calories consumed and resists weight loss during times of limited food availability. Integrated methylome and transcriptome analysis from fat and liver of F4 animals revealed that ancestral TBT exposure led to persistent changes in global DNA methylation consistent with architectural changes in chromatin structure. Our results show that ancestral, in utero exposure to TBT alters chromatin structure to modulate expression of genes important for fat storage and mobilization and suggest that the transgenerational phenotype likely results from large scale changes in chromatin structure, rather than specific epimutations in individual genes.

2:30 – 3 p.m.
Endocrine Disrupting Chemicals: Costs and Consequences
Leonardo Trasande, M.D., M.P.P.
Associate Professor of Pediatrics, Environmental Medicine and Population Health | NYU School of Medicine

Dr. Leonardo Trasande is a tenured associate professor in pediatrics, environmental medicine and population health at the NYU School of Medicine, and in health policy at the NYU Wagner School of Public Service and at the NYU College of Global Public Health. Dr. Trasande's research focuses on identifying the role of environmental exposures in childhood obesity and cardiovascular risks, and documenting the economic costs for policy makers of failing to prevent diseases of environmental origin in children proactively. Dr. Trasande is perhaps best known for a series of studies in *The Lancet Diabetes and Endocrinology* and *The Journal of Clinical Endocrinology and Metabolism*, which identified diseases and disabilities due to endocrine disrupting chemicals costing $340 billion/year (2.3% of GDP) in the US and €163 billion/year (1.2% of GDP) in Europe.

Abstract: Endocrine disrupting chemicals contribute substantially to disease and disability across the lifespan. This presentation will provide an overview of the evidence that has accumulated to date for potential cause-and-effect relationships. The likely costs in the US and EU range from 1-2%. Substantial differences exist between the two settings regarding the origins of these costs. These differences speak to the reality that policies change exposures, exposures predict disease, and ultimately disease costs society. Finally, there is substantial evidence of the large economic benefits that come with proactive policy prevention and are greater than the costs.

3 – 3:30 p.m.
Proactive Approaches to Reduce Environmental Exposure: Avoidance, Lifestyle Changes and Practical Resources
Aly Cohen, M.D., F.A.C.R., FABoIM
Founder and Medical Director | The Smart Human™

Dr. Aly Cohen is a rheumatologist, integrative medicine, and environmental health specialist practicing in Princeton, NJ. Dr. Cohen received her undergraduate degree at the University of Pennsylvania. She went on to medical training at Hahnemann University Hospital School of Medicine in Philadelphia and completed her internship and residency in internal medicine at Beth Israel Medical Center in New York City and rheumatology training at Albert Einstein/Montefiore in the Bronx, NJ. She received a full scholarship to train with Dr. Andrew Weil and colleagues for two years at the famed Arizona Center for Integrative Medicine. Her medical practice, which she founded in 2011, Integrative Rheumatology Associates P.C., focuses on both traditional western medical management of rheumatologic and other ailments, as well as integrative options for total "wellness," such as biofeedback, acupuncture, cognitive therapy, diet and exercise counseling, environmental toxin counseling, smoking cessation, stress management and sleep evaluations. Dr. Cohen is active in educating the next generation, writing curriculum on environmental health topics to be made available by high schools and colleges nationally. Her recent text, "Integrative Environmental Medicine" has just been published through Oxford University Press. Dr. Cohen is a regular health contributor to print, radio and news broadcasts, such as Fox 5 NY, and lectures nationally on various health topics including integrative medicine, autoimmune disease/inflammation, health effects of everyday chemicals and cell phone safety. She shares practical vetted health and prevention tips and information regularly on her website, TheSmartHuman.com, and on her Facebook page, The Smart Human, Twitter and Instagram.

Abstract: Our environment has changed profoundly over the past 100 years. More than 87,000 new chemicals have been developed and integrated into our way of living without adequate testing to ensure safety for adults and particularly for children. As the number and quantities of chemicals in our environment has dramatically increased, so too have the patterns of disease changed among humans over the same post-World War II era, including a precipitous rise in incidence of type 2 diabetes, obesity, thyroid disease, asthma, allergy,

autoimmune disease, autism, ADHD and several cancers. This session will briefly discuss the history and regulation of chemicals in the U.S., a special class of chemicals called endocrine disruptors and their unique biological properties, the rising incidence of chronic health issues associated with many environmental chemicals and radiation, and proactive approaches to reducing exposure to chemicals in our everyday lives. Dr. Cohen will share tools, tips and recommendations for limiting chemical exposure and maximizing our innate biological detoxification pathways through safe use of exercise, diet, sleep hygiene and other means.

3:30 – 3:45 p.m.
Coffee Break

Breakout Session: Taking Action to Minimize Risk

3:45 – 4:45 p.m.

4:45 – 5 p.m.
Closing Remarks
Richard Piacentini
Executive Director | Phipps Conservatory and Botanical Gardens

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