SETAC NORTH AMERICA 38TH ANNUAL MEETING
November 12, 2017 – November 17, 2017
Minneapolis Convention Center
1301 2nd Ave S
Minneapolis, Minnesota 55403

Environmental Toxicology Program (M.S. & Ph.D.)
Department of Environmental & Interdisciplinary Sciences
EIS.TSU.EDU

Society of Environmental Toxicology and Chemistry
2017 South - Central Regional Meeting
April 28-29, 2017
“Environmental Justice”

Texas Southern University
Department of Environmental & Interdisciplinary Sciences
3100 Cleburne Street
Houston, Texas 77004
713.313.7096
On behalf of the Office of the Provost at Texas Southern University (TSU), I welcome you to the South-Central Regional Meeting of the Society of Environmental Toxicology and Chemistry (SETAC). It is my pleasure to invite you to participate in the technical sessions and workshops. I also encourage you to partake in the many historical attractions in the City of Houston, starting with our beautiful campus. I especially welcome the students, professional members, academic partners and industrial supporters.

This year’s theme, “Environmental Justice” further strengthens SETAC’s mission to the organization. To support the development of principles and practices for protection, enhancement and management of sustainable environmental quality and ecosystem integrity. The mission and the goal of this regional meeting only seeks to increase the knowledge and skills of environmental scientists and chemists to further ensure that all are protected from environmental hazards.

As you visit the technical sessions and network with faculty, students, and industrial professionals, I am confident you will increase your desire to understand the multifaceted world of environmental toxicology and chemistry.

Please allow me to close by thanking you for your support and attendance at the South-Central Regional Meeting of SETAC being hosted by the TSU-SETAC student chapter.

Sincerely,

Bobby Wilcox, Ph.D.
Interim Provost and Vice President of Academic Affairs

⇒ Follow green arrow to come to Science Building from the Parking Garage.
⇒ Parking fee is $3.00 per day.
### LIST OF AUTHORS

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<th>Author</th>
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### Meeting Agenda

**Friday, April 28, 2017**

- **12:00 p.m.—1:00 p.m.**  Registration  
  Science Building, 303H
- **1:00 p.m.—5:00 p.m.**  Student Workshop  
  Science Building, Room 156

**Saturday, April 29, 2017**

- **7:30 a.m.—10:30 a.m.**  Registration  
  Science Building, Atrium
- **7:30 a.m.—8:20 a.m.**  Breakfast  
  Science Building, Atrium
- **8:00 a.m.—8:20 a.m.**  Greetings  
  Science Building, Room 156
- **9:40 a.m.—9:55 a.m.**  Break  
  Science Building, Room 156
- **9:55 a.m.—11:30 a.m.**  Platform Session I  
  Science Building, Room 156
- **11:30 a.m.—12:50 p.m.**  Lunch  
  Science Building, Atrium
- **12:50 p.m.—2:10 p.m.**  Platform Session II  
  Science Building, Room 156
- **2:10 p.m.—2:25 p.m.**  Break  
  Science Building, Room 156
- **2:25 p.m.—3:50 p.m.**  Platform Session III  
  Science Building, Room 156
- **4:00 p.m.—4:30 p.m.**  Business Meeting  
  Science Building, Room 146
- **4:30 p.m.—5:30 p.m.**  Poster Session  
  Science Building, Atrium
- **6:00 p.m.—7:30 p.m.**  Awards Dinner  
  Science Building, Atrium

**Sunday, April 30, 2017**

- **9:00 a.m.—11:30 a.m.**  Toxic Tour (Cancelled)
PLATFOM PRESENTATION SCHEDULE

Morning Platform Session I
1. Shanoy C. Anderson
2. Peter C. Bruns
3. Caleshia S. Calvin
4. Matthew J. Fiala
5. Marco E. Franco

Morning Platform Session II
1. Amanda French
2. Pavani Gonnabathula
3. Alex Kascak
4. Julie C. Kryzkwa
5. Steven Lasee
6. Lihua Lou

Afternoon Platform Session I
1. Jason Magnuson
2. Michelle M. Memanus
3. Mourina O. Mogem
4. Celeste Ortega-Rodriguez
5. Elias Oziolor

Afternoon Platform Session II
1. Eric M. Peterson
2. Mitchell Schynder
3. Kelsey N. Thompson
4. Onyanobi Abel-Anybe

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Chlorotetracycline in White-tailed Deer (Odocoileus virginianus) and Supermarket Meat by Liquid Chromatograph-tandem Mass Spectrometer

Shanoy C. Anderson, Seenivasan Subbiah, Angela A. Gentles, Paul Stoumin, Tiffanie A. Brooks, Ernest E. Smith

A method for determining chlorotetracycline residues in edible white-tailed deer tissues, using liquid chromatograph with heated electrospray ionization and mass spectrometer detection. The procedure involved an extraction with EDTA-McIlvaine buffer at pH 4.0, followed by solid-phase extraction cleanup using a Hydrophilic-Lipophilic Balance (HLB) cartridge. The liquid chromatography analysis was performed with heated electrospray ionization and mass spectrometry detection. The limit of quantification for the method was 0.77 µg/kg and limit of detection was 0.58 µg/kg. The recovery values were greater than 78.5% for muscle, 65.1% for kidney, 63.1% for liver. Mean residue concentration of chlorotetracycline (CTC) and its epimer 4-epi chlorotetracycline (4-epi-CTC) at 10-day withdrawal period for kidney, liver, muscle 122.8, 44.7 and 26.7 µg/kg respectively. Chlortetracycline tissue residue concentration at 45-day withdrawal period for kidney, liver, muscle 19.2, 28.9 and 10.7 µg/kg respectively. Mean tissue concentration of CTC + 4-epi-CTC were less than the established maximum residual limit (MRL) values for bovine tissues. The method has been successfully used for the quantification of chlorotetracyline in white-tailed deer tissue samples.

Reproductive Effects of Early Life Stage Thyroid Disruption in the Fathead Minnow

Peter C. Bruns, Bethany L. Pierce, Mallory M. Seemann, and Marlo K. Jeffries

Exposure to contaminants during development have the potential to cause adverse biological alterations that can persist through development periods and into adulthood. This study examined the effects of chemically induced, early-life-stage thyroid disruption on endpoints associated with thyroidal and reproductive function in the fathead minnow (Pimephales promelas). Fish were exposed to propylthiouracil (PTU) from 1 to 43 days post hatch (dpb) to induce hypothyroidism. At the end of exposure, length and weight were measured and samples were taken for gene expression analysis. The remaining fish were transferred to un-dosed water and raised to maturity and, at 164 dpb, a 21-day breeding assay was performed. At the end of exposure, fish exposed to PTU had significantly reduced length, weight, and condition factor. There were also significant differences in expression of several genes involved in the thyroid and reproductive signaling systems. After maturation, there were no significant differences in any morphological variables. During the 21-day breeding assay, fish exposed to PTU during development had significantly reduced number of clutches and eggs per clutch, and significantly reduced overall fecundity. The results show that early-life-stage hypothyroidism can affect reproductive function later in life even after thyroid related endpoints have returned to control levels.

Cytochrome P450A Expression in Chorioallantoic Membrane, Liver, and Skin of Kemp’s Ridley Sea Turtles (Lipiodochelys Kempii)

Caleahis S. Calvin, Kimberly D. Hickok, Janet E. Yacabucci, Donna J. Shaver, Céline A.J. Godard-Coddling

The 2010 Deepwater Horizon incident is the largest oil spill in the history of the United States. This anthropogenic disaster impacted the Gulf of Mexico’s coastal ecology and exposed countless marine organisms, such as sea turtles, to oil. The primary habitat of the critically endangered Kemp’s ridley sea turtle (Lipiodochelys kempii) is the Gulf of Mexico, leading to concern for their welfare and conservation. Under the direction of the U.S. Department of the Interior, a Natural Resource Damage Assessment was put in place to evaluate the effects of this spill and appraise future restoration efforts. The project presented here is part of this assessment. Cytochrome P450A1 (CYP4A1) expression is a known biomarker of exposure to chemicals, including polycyclic aromatic hydrocarbons present in crude oil. CYP4A1 protea expression in Kemp’s ridley was evaluated via immunohistochemistry in both skin biopsies of nesting mothers collected in 2011 and paired liver and chorioallantoic membrane (CAM) tissues of late stage hatchings collected in 2010 and 2011 from Padre Island, TX, USA. CYP4A1 expression was measured following the methods of Godard et al. (2004). Tissues were formalin-fixed, embedded in paraffin, sliced by microtome and mounted on microscope slides, prior to staining with monoclonal mouse antibody. CYP4A1 expression was low in all samples analyzed. A moderate positive correlation in CYP4A1 expression was observed between liver and CAM tissues, supporting the relevance of CAM samples in endangered species studies where non-invasive samples are required. Future analyses comparing CYP4A1 expression amongst sampling years and various organs is underway.
Sources of Fine Sediment Particles in Roadway Stormwater Runoff in the Lake Tahoe Basin

Mattheo Fiula, Hyun-Min Huang, Russel Wigart, Raph Townsend, Veronica Ehleveer-Vasquez

The clarity of Lake Tahoe water column has declined since the late 1990s. More than 50% of Lake Tahoe’s clarity loss can be attributed to fine sediment particles (< 10 mm) from various sources. This study was to identify major sources of fine sediment particles and associated phosphorus in winter roadway runoff, quantify the contribution of each major source, and investigate time-series changes of runoff turbidity and elemental composition of fine sediment particles. Roadway runoff samples were collected using ISCO automatic water sampler from two sites (Cattlemans and Pioneer) located on Pioneer-Trail in the Lake Tahoe Basin. Runoff samples were measured for turbidity and sieved (20 μm) to collect fine sediment particles. Organic matter content, oil and grease, elements (Co, Cr, Cs, Cu, Fe, Li, Mn, Ni, Pb, V, Zn), and organic markers were quantified to calculate the contribution of fine sediment particles from various sources using chemical mass balance model. Approximately 50% of fine sediment particles in roadway runoff originated from non-traffic related sources such as eroded soil and vegetation debris from road side hills. It is interesting to note that asphalt pavement wear particles accounted for 30.6 ± 7.6%, which is the second most abundant source of fine sediment particles in collected roadway runoff. These particles were produced when snow plow steel blades and tire chains grind asphalt pavement. The contribution of abrasive sand 16.2 ± 4.3%. To reduce the loading of fine sediment particles and avoid installation of new treatment BMPs, side hill soil erosion control and new roadway management practices (e.g., plastic blade rather than steel blade for snow plow) must be adopted.

Crude Oil Disrupts Bioturbation Activity, Increases Oxidative Stress and Results in Histopathological Changes in the Hepatopancreas of the Fiddler Crabs Uca Longisignalis and Uca Panacea from the Northern Gulf of Mexico

Marco E. Franco, Paul L. Klerks, Bruce E. Felgenhauer

Two of the most common macroinvertebrate species in coastal ecosystems from the northern Gulf of Mexico are the gulf marsh fiddler crab (Uca longisignalis) and the gulf sand fiddler crab (Uca panacea). Their burrowing and feeding activities are fundamental for sediment oxygenation and nutrient availability in coastal sediments. Due to high activity of the oil and gas industry in the gulf and the prominent danger for oil spills, fiddler crabs are at a high risk of being exposed to crude oil. To obtain insight into the toxicity of crude oil to fiddler crabs, mesocosms were established in a greenhouse, and filled with sediment and water from fiddler crab collection sites in Grand Isle, LA. Experiments were conducted for 10 days, for each species separately and for both species combined. Fiddler crabs were exposed to crude oil concentrations of 2 to 55 mg/cm², by spreading an oil-sediment mixture over the sediment surface in each mesocosm. Oil exposure led to significant reductions in burrow size (diameter, depth and volume) and in their bioturbation activity compared to control (differences showed to be statistically significant). Additionally, both species showed increased oxidative stress, quantified by the TBARS assay, after exposure to high concentrations of crude oil. Because oxidative stress usually induces membrane damage, light microscopy is currently being used to assess the occurrence of morphological changes and histological damage in hepatopancreas cells. The results from this study provide further insight into the potential for oil spills to disrupt the important ecological processes mediated by fiddler crabs.

Presence of Antimony as Evidence of Lead Shot Ingestion by American Woodcock

Amanda French, Warren Conway, David Klein

Lead (Pb) ammunition left in the environment can be consumed by birds and cause health problems including lethargy, anorexia, and death. The danger of Pb ammunition has been well documented in waterfowl, but remains a concern for weanling migratory gamebirds, upland gamebirds, and scavenger species. The American woodcock (Scolopax minor) is a small, weanling migratory gamebird known to have elevated tissue Pb concentrations. The primary source of Pb in woodcock is Pb shot, however, current source determination methods have not substantiated this claim. To identify a reliable and consistent signature of Pb shot presence in birds, we hypothesized that the trace metal antimony (Sb) would be a suitable indicator of Pb shot exposure. Antimony is added to Pb shot pellets to increase pellet hardness and is not found in high concentrations (typically < 0.5 ppm) within the environment. Therefore, Sb would be a reliable indicator of Pb shot exposure in woodcock if Sb is > 0.5 ppm in woodcock tissue, as Pb shot is the most likely source of elevated Sb. Lead and Sb concentrations were determined in 96 hatch year (< 30 month old) woodcock feathers and wing bones. A positive correlation between Pb and Sb (feather r² = 0.51; bone r² = 0.80) was found in both tissues, indicating that Pb shot is a source of elevated Pb in woodcock. This experiment has provided proof of concept to show the potential reliability of using antimony as an indicator of Pb shot exposure in birds.

In-Vehicle Noise Pollution Exposure on Highways

Qing Li, Jengxiang Qiao, Lei Yu

Noise is one of the typical hazardous emissions. Regular and long-term exposure to elevated noise can bring about various adverse health effects, such as hearing impairment, hypertension, ischemic heart disease, annoyance, and sleep disturbance. Various noise pollution controls have been implemented in households, industries, traffic and other noise sources; whereas an automobile cab has been never regarded as a place that needs to protect passengers and drivers from the noise. In practice, most of the people in the U.S. still rely on their personal vehicles for mobility and each of them spends plenty of time on daily commuting and being stuck in traffic. There is a lack of studies in the in-vehicle noise exposure levels during commuting time and the risk of adverse health consequences to the public. This research intends to investigate the distribution of the in-vehicle noise exposure, assess the risk of the in-vehicle noise exposure for commuters. An on-road driving test was conducted on the State Highway 288 in Houston Texas in May 2016. Twelve subjects were recruited to drive a dedicated vehicle through a designed 35 km-long test route. The test vehicle’s road-time activity information and in-vehicle sound levels were collected by an On-board Diagnosis II and a digital sound meter, respectively. Results show that commuters are chronically exposed to the in-vehicle noise at the level between 75 dB(A) and 85 dB(A) on highways, which can cause negligible risk of hearing impairment.

Determining Phytotoxicity of Carbon Nanotubes in Heat and Drought Stressed Crops

Juliette Jordan, Jaelyn E. Canas-Carrell, Paxton Payton, David Tissue

Carbon nanotubes (CNT) are manufactured nanomaterials currently being used in medical and pharmaceutical devices, wastewater treatment, and electronics. Because of their wide range of uses and small size, CNTs are an emerging and growing contaminant of concern. This study evaluated the effects of multi-walled carbon nanotubes (MWCNTs) in soil on heat, drought stressed tomato and drought stressed cotton. Tomato plants were grown in a greenhouse under regular growing conditions during which time the greenhouse was held at an average temperature of 28ºC (day and night). Cotton plants were not grown under heat stress. A subset of both tomato and cotton plants was also subjected to water deficit conditions. Photosynthetic response was measured before, during, and after the water deficit. Plants grown in soil mixed with CNTs showed delayed early growth, CNT exposure influenced tomato and cotton plant photosynthetic response to water deficit stress. Results of past studies have varied depending on plant species and type of CNT. However, whether there is variability in stress response or an impact of climate for different species has yet to be determined. More research is needed on the effects CNTs have on different crop species and different genotypes under varying environmental conditions.
ABSTRACTS FOR POSTER PRESENTATION

26. Impact of Ramp Metering Strategy on Vehicle Exhaust Emissions
Jianbang Du, Qing Li, Fengsheng Qiao, Lei Yu

Ramp meters are signal devices installed on highways to regulate the traffic flow according to current traffic conditions on highway. Texas Department of Transportation has operated 60 ramp meters in Houston district since 1990s. The ramp metering strategy increases the average vehicle speed and decreases the accident rate and driving time significantly. However, there is no sufficient study focusing on vehicle exhaust emissions at ramp metering. This research attempts to obtain an insight into vehicle emission levels when the ramp metering strategy is implemented. On-road driving tests were conducted during peak and non-peak hours along the South Bound of Houston highway I-45 N, which includes 6 on-ramps. The ramp meters were activated mainly during peak traffic on demand at traffic conditions. The exhaust emission data was collected on a dedicated light-duty vehicle by using a portable emissions measurement system (PEMS), an On-Board Diagnosis (OBD) II recording system, and a GPS device. Statistical result showed that the on-ramp exhaust emissions were increased while the mainline exhaust emissions decreased if the ramp metering strategies are activated. Since the ramp flow is far less than the mainline flow, the entire exhaust emissions for the whole highway system were decreased. This means that a ramp metering strategy can reduce the air quality benefit of the highway system. It is suggested further improving ramp metering strategies towards an integrally controlled highway system for better environmental effects.

27. Sublethal Toxicity of the Harmful Haptophyte Prymnesium Parvum to Two Common Fish Species
Bridgett N. Hill, Jone Corrales, Lauren A. Kristofco, W. Baylor Steele, Gavin N. Saari, W. Casan Scott, Bryan W. Kehret

Anthropogenic activities and climate change have resulted in a global increase in the occurrence of harmful algae blooms (HABs). Prymnesium parvum is an invasive toxin producing haptophyte commonly referred to as "golden algae" or the "Texas Tide" that forms HABs leading to massive fish kills. Though we have made progress understanding factors leading to ambient toxicity associated with bloom development and termination, an understanding of how stress (OS) responses occur after exposure to P. parvum cultures; (2) to determine if sublethal OS responses are altered by nutrient stress during toxicant exposure. Presently, the FET test protocol does not include endpoints that allow for the prediction of sublethal adverse effects and chronic toxicity. Future studies aimed at linking alterations in these endpoints to longer term or non-lethal adverse impacts are needed to fully describe the predictive power of these metrics in whole effluent and chemical toxicity testing.

ABSTRACTS FOR PLATFORM SESSION

Effects of Emerging Contaminants at Trace Level on Nitric Oxide (NO) Levels and Superoxide Dismutase (SOD) Activity in Mice: Role of Sex and PPARα
Parvani Connabathula, Momoh A Yakubu

Toxicological effects of traditional water contaminants such as lead and arsenic are well known. Recently, trace amounts of chemical pollutants such as nonylphenol, pentachlorophenol, personal care products, pesticides, herbicides and endocrine disrupting compounds are detected in our drinking water. These trace chemical pollutants pose environmental and human health concerns. So, we have investigated the effects of trace concentrations of multiple pesticides (MP) on the regulation of NO signaling molecular levels and SOD activity in the tissues from wild type and PPARα knockout mice. Wild type/ PPARα knockout mice (male and female) were exposed to trace concentrations of multiple pesticides including atrazine, dieldrin, endosulfan and antrachene (1-100 μg/ml) in drinking water for six weeks. Blood and organs were collected, homogenized and NO levels and SOD activity were determined by Griess/SOD assay. In the blood samples, treatment with low MP reduced NO (20%) in the female in the male NO was 90% higher in wild type compared to PPARα knockout female. NO levels increased in tissues from wild type: spleen (80%), liver (75%), kidney (85%) and brain (85%), while in PPARα knockout NO levels were reduced in spleen (45%) but increased in the kidney (55%) with no change in the brain. Liver, and heart. In the male. NO levels were reduced in the heart (66%) and liver (40%) with no change in the kidney, spleen, brain, and testicles. Blood SOD activity is 90% greater in male than female. MP attenuated NO activity by 20% with no change in the female. Female tissue SOD activity was significantly reduced in the heart (30%), liver (45%), and spleen (25%) of treated mice with no effect in the brain and the kidney. In the PPARα knockout mice, NO activity was significantly increased in the heart (50%) and liver (25%) but not in the kidney, spleen, and brain. Thus, low concentrations of multiple pesticides caused selective dysregulation of NO/SOD systems in different organs of the body. The effects observed was sex dependent and may be influenced by genetic status as in PPARα knockout. These results present a scenario that implicates nano levels of series of organic contaminants that can cause cellular and molecular dysregulations of biomolecules precipitating toxicity and pathology that can be a threat to human health. Further investigation into the molecular mechanism(s) and signaling pathway(s) implicated in these dysregulations is warranted and is of interest.

Lethality of Crude Oil on Lepidophthalmus Louisianensis at Various Life Stages
Alex Kaseke, Paul L. Klers

Lepidophthalmus louisianensis, commonly known as the ghost shrimp, lives along the northern coast of the Gulf of Mexico (GoM) in subtidal and intertidal areas. This species creates burrows that can reach depths greater than two meters. These burrows connect below the sediment surface and create a large network. The presence of the shrimp and their burrow structures alters abiotic and biotic factors, allowing the shrimp to have a large impact on the area. Living on the coast of the GoM means that this species is at risk for crude oil exposure due to an oil spill as happened in 2010 due to the Macondo well blowout. Experiments are being conducted on adult and larval individuals to assess the lethality of the crude oil. Experiments are conducted within environmental chambers to control light and temperature. Adult shrimp are exposed individually within micrometers to crude oil exposure at the surface, while larval shrimp are exposed in groups within glass beakers to the water-constructed fraction (WAF). Toxicity tests are short as they are intended to determine acute toxicity and preliminary results for larval survival of the nova and decapod life stages show a much greater resistance to WAF at the decapod adult life stage, as well as a significant positive correlation between WAF concentration and time until death for both stages. Adult resistance is currently being assessed; results will be presented at the conference.

Cardiovascular Metrics as Sublethal Endpoints for the Fish Embryo Toxicity Test
Julie C Krykova, Alexis Oliivas, Marlo K Jeffries

The United States requires that whole effluent and chemicals be tested for aquatic toxicity using the fathead minnow larval growth and survival (LGS) test. While the LGS test has been effective for determining acute and chronic aquatic toxicity, a fathead minnow fish embryo toxicity (FET) test has been proposed as a refinement to the LGS as younger organisms are thought to experience less stress during toxicant exposure. Presently, the FET test protocol does not include endpoints that allow for the prediction of non-lethal adverse outcomes or chronic toxicity. This limits its utility relative to other test types. This study investigated the utility of sub-lethal endpoints related to cardiovascular function and development (e.g., heart rate, pericardial area, and cardiovascular related genes) as additional FET test metrics. FET tests were run with four model toxicants: 2,4-dichloroaniline, sodium chloride, cadmi um, and trioxolane. Heart rate was measured at 76 hpf, while pericardial area was assessed at 120 hpf. Hatched larvae were sampled at the conclusion of the tests (28hdpf) for gene expression analysis. Pericardial area was identified as the most sensitive sub-lethal endpoint, although alterations were also seen in the other metrics investigated. These alterations suggest that sublethal endpoints related to cardiovascular function and morphology may be useful for estimating non-lethal adverse effects and chronic toxicity. Future studies aimed at linking alterations in these endpoints to longer term or non-lethal adverse impacts are needed to fully describe the predictive power of these metrics in whole effluent and chemical toxicity testing.
ABSTRACTS FOR PLATFORM SESSION

Uptake of Several Short and Long-chain Perfluorinated Compounds (PFCs) by Carrots (Daucus carota), Cadishes (Raphanus Sativus), Alfalfa (Medicago sativa), and Tomato (Solanum lycopersicum) Grown in Soils Contain- ing Different Organic Carbon Content

Steven Lasee, Seenivasan Subbiah, William Thompson, Paxton Payton, Todd A. Anderson

Perfluorinated compounds (PFCs) are incredibly stable environmental contaminants. In 2014, the United States Environmental Protection Agency labeled perfluorooctanoic acid and perfluorooctanesulfonic acid, the most persistent and toxic PFCs, as emerging contaminants due to their persistence in the environment. Data from animal studies on perfluorinated compounds indicate that they can cause several types of tumors, neonatal death, and may have toxic effects on the immune, liver, and endocrine systems. While many studies have evaluated the fate of PFCs in aquatic environments, the objective of this study was to determine PFC levels taken up by vegetation under a maximum availability scenario for a terrestrial environment. We grew carrots (Daucus carota), radishes (Raphanus sativus), alfalfa (Medicago sativa), and Tomato (Solanum lycopersicum) in laboratory grade sand, potting soil, and a 1:4 potting soil/sand mix. Sand was chosen due to its low organic carbon content making PFC bioavailability highest. The soils were spiked with 10 ng/g (100 ppb) perfluorooctanoic acid, perfluorooctanesulfonic acid, perfluorohexanoic acid, perfluorobutanesulfonic acid, perfluorooctanoic acid, or perfluorooctanesulfonic acid; six PFCs that are currently or previously used in manufacturing and vary in chemical chain length. The plants were watered as needed with nutrient solution and allowed to mature (roughly 60 d). PFC concentrations in mature plant tissue were determined by LC-MS in an effort to calculate root, stem, leaf, and seed/fruit bioconcentration factors under this scenario.

Preparation and Study of Low-resistance Polyacrylonitrile Nano Membranes for PM2.5 Clean Pp

Lihua Lou, Hongnan Zhang, Seshadri Ramkumar, Xiaohong Qiu

Particulate matter (PM), especially PM2.5, not only leads to serious air pollution, but also has been ranked by the World Health Organization as the 13th leading cause of mortality worldwide. Nano filter membranes have small pore size, small fiber diameter, high filtration efficiency, which has been estimated as a possible effective method to solve this problem. However, with a pressure drop of 9 to 1500 Pa and productivity rate of 1-100 g/h, it is less likely to be used as commercial products. In this paper, patterned nano filter membranes with large pore size were fabricated to adjust the pressure drop and filtration efficiency. Polyacrylonitrile was employed as the electrosprinning material as it is a common and fluffy fiber. Structured receiving templates and cylinder were used to prepare the patterned membranes. A needleless electrospraying method with a production rate of 25 g/h was used to fabricate the membranes. A needless electrospraying method with a production rate of 20-25 g/h was used to produce nanofoam membranes. With the special structure, patterned nano membranes significantly declined from 1500 Pa to about 150 Pa, with the filtration efficiency a slight decline from 99.95% to about 98% compared to traditional electrospraying nanofoam membranes. These sharp declines of the pressure drop while retaining the filtration efficiency make it an excellent filter for air pollution.

Assessing Vision in Sheepshead Minnow Following Oil Exposure

Jason Magmison, Aaron Roberts

During the Deepwater Horizon spill millions of barrels of oil were released into the Gulf of Mexico at peak spawning periods of estuarine fishes, including the sheepshead minnow (Cyprinodon variegatus). Developmental abnormalities have been shown to result from polycyclic aromatic hydrocarbons present in the oil, and could impact the vision of these fish. In this study, larval sheepshead minnow, ranging from 4 day post hatch (dph) to 6 dph, were assessed for visual function using the flicker fusion principle to monitor ontogenetic response. Embryonic sheepsheads were exposed to high energy water accommodated fractions of weathered oil and opsinmotor response was determined. Visual acuity in larval sheepshead was significantly reduced following exposure to oil. Retinal layers were observed histologically to determine changes in eye morphology throughout development and oil exposure. The results of this study provide information on visual and behavioral impacts of oil on fish vision.

ABSTRACTS FOR POSTER PRESENTATION

2.3. Bombax Celba: A Potential Source of Biodiesel Production

Theresa Jibunor, Kevin Anthony, Duma Hungathi, Mahmoud A. Saleh

This study, focused on the use of Bombax Celba seed oil as a potential source for biodiesel production. Due to the heavy reliance of fossil fuel, the gradual shift to biodiesel is imperative. Recently, biodiesel production has been focused on traditional seed oils such as sesame seed, sunflower oil, seed palm etc. The objective of this research was aimed at describing the physical and chemical properties of the seed oil, techniques used to analyze extraction yield and investigate the viability of the biodiesel produced from Bombax Celba. The different extraction techniques used were: Soxhlet Extraction, Percelation, Ultrasound Extraction, Microwave Assisted Extrac- tion and Supercritical Fluid Extraction. The different extraction were used to determine percentage yield. The samples were analyzed using HPTLC (High Performance Thin Layer Chromatography) for separation of chemical mixture, GC-MS (Gas Chromatograph-Mass Spectrometer), GC-FID (Gas Chromatograph-Flame Ionization Detector), and GC-IR (Gas Chromatograph- Infrared Spectrom- eter) for Fatty Acid Methyl Ethers analysis, IR (Infrared radiation) for functional group identification and HPLC-MS (High Perform- ance Liquid Chromatograph- Mass Spectrometer) for triglyceride analysis. The acids catalyzed reaction (H2SO4 and BF3) was compared with the base-catalyzed reaction (KOH). The results obtained suggested that the Bombax Celba seed oil is rich in unsatur- ated fatty acids, the major components of unsaturated fatty acids are Linoleic (C18:2), Oleic (C18:1) and the saturated fatty acids are Stearin (C18:0) and Palmitic (C16:0). The Percolation technique was found to produce a higher yield, however the microwave assist- ed technique is considered a better extraction method based on the solvent amount used and the time required.

2.4. Determination of Polycyclic Aromatic Hydrocarbons in Roasted Coffee

Angelia D. Jimenez, Afolabi Adisa, Cara Woodham, Mahmoud A. Saleh

The presence of Polycyclic Aromatic Hydrocarbons (PAHs) in environmental samples such as water, sediments, and particulate air has been extensively studied, but food samples have received less attention. The objective of this research was to identify and deter- mine the concentration of PAHs in light, medium, and dark roasted coffee including instant and decaffeinated brands. PAHs are tox- ic compounds that are suspected to be carcinogenic or procarcinogenic. Total PAHs concentration was related to the degree of roast- ing with light roasted coffee showing the lowest and dark roasted coffee showing the highest levels. Both instant and decaffeinated coffee showed lower levels of PAHs. Naphthalene, acenaphthylene, pyrene, and chrysene were the most abundant individual isomers. The concentrations ranged from 0 to 786 ng/g for naphthalene, 1 to 512 ng/g for acenaphthylene, 60 to 479 ng/g for pyrene, and 56 to 371 ng/g for chrysene. Intensive food or beverage studies can help determine the amount of PAHs present in the food or beverage intake per item. Thus, for coffee beverages, the roasting conditions should be controlled to avoid the formation of PAHs due to their suspected carcinogenic and mutagenic properties.

25. Trace Elements in Wild and Captive Hawaiian Green Sea Turtles (Chelonia mydas)

Katherine Shaw, Jennifer Lynch, George Balas, Todd Jones, Jeff Pawloski, Marc Rice, David Klein

The Hawaiian subpopulation of green sea turtles is listed as threatened under the Endangered Species Act of 1973, and is protected by international laws. Increasing evidence suggests exposure to toxic metals decreases immune function and leads to development of fibropapillomatosis, a disease that causes tumor formation on soft tissues. Due to their protected status, non-invasive sample collection methods are required for contain- ment measurements. Blood provides a good representation of recent exposure, while scutes (keratin comprising the turtle shell) indicate long term exposure. This study compares green sea turtles in captivity at Sea Life Park in Oahu, Hawaii, to wild green sea turtles around the Hawaiian Is- lands. Blood and scute samples from six green turtles at Sea Life Park and nine wild green turtles were selected from the NIST Marine Environmental Specimen Bank and are being analyzed by Inductively Coupled Plasma - Mass Spectrometry (ICP-MS). Metals of interest include: Hg, Cd, Pb, As, V, N, Cr, Co, Ba, Al, Cu, Mn, Se, Cr, Ag, Sn, Fe, and Co. This is the first study to compare metals in captive turtles with their wild counterparts, indicating long term exposure. The results indicate long term exposure, and provide a baseline for which to compare wild turtles.

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21. Distribution of Heavy Metals in Bank Soils of Brays and Sims Bayou Watersheds in Houston, TX

Habibur Howlider, Manpreet Singh, Bhaskar

The accumulation of trace metals in soil is a serious environmental problem that creates a hazard when metals are transferred to water or plants and also harmful for human health. A total of 48 bank soil samples were collected from upper and lower creek of Brays Bayou and Sims Bayou watersheds within Harris County, Houston in Spring, 2016 to analyze the heavy metal concentrations of soil samples. The objectives of this study was to analyze and compare the heavy metal (Hg, As, Pb, Cr, Mg, Mn, Cu, Sr, Ba, Mo, Zn) concentration in soil samples within Brays Bayou and Sims Bayou watersheds. The concentration of heavy metals in soils were conducted by microwave digestion technique followed inductively coupled plasma mass spectrometry (ICP-MS). A complete digestion of soils was achieved by following EPA 3051A method which includes digestion of 0.5 gm soil with 10 ml of concentrated HNO3. The results from the metal analysis showed that the Hg and As were both present in higher amounts compared to other elements.

22. Comparison of Heavy Metals in Oysters from Three Reef Restoration Designs in West Galveston Bay, Texas

Korry J. Huddleston, Cindy Howard

Oyster reef restoration construction has become common along the southern United States coastlines. Few studies, however, compare the effects the binding substrate has on metal concentrations in oysters. This study explores the effects of three different designs constructed in the West Galveston Bay area, by comparing heavy metal concentrations in oyster tissue. Samples were analyzed for Pb, Zn, As, Cd, Cu, and Fe for this study. Samples were digested and analyzed by ICP analysis. This project aims to assist future restoration projects when determining the most beneficial design in terms of organism health. Results will be discussed during the poster presentation.
Evolution to Pollution in Gulf Killifish (Fundulus Grandis) from Galveston Bay, Texas, USA

Elias Oziolor, Noah Reid, Benjamin Dubansky, Sarah Guberman, Kimberly Yuung, Zachary Winfield, Jennifer Apell, Lissette Aguilar, Jeffrey Back, Phillip Gschwend, Warren Berggren, Suecha Usenko, Joseph Shaw, Andrew Whitehead, Cole Matson

ABSTRACTS FOR PLATFORM SESSION

Anthropogenic contamination associated with industrial activity is a widespread and active threat to the stability of organisms. The Houston Ship Channel (HSC) is one example of a heavily impacted environment, where industrial activity has contributed to extreme levels of pollution with various classes of contaminants, such as polychlorinated dibenzo-p-dioxins and furans (PCDD/Fs), polycyclic aromatic hydrocarbons (PAHs) and polychlorinated biphenyls (PCBs). This dissertation studies the impacts of chronic multi-generational exposure to industrial contamination on the population structure, resistance and demography in a keystone coastal species – Gulf killifish (Fundulus grandis). We have characterized their sensitivity to contaminants in populations from 12 locations across Galveston Bay, as well as the contamination levels at those sites. We found a gradient of resistance that was positively correlated with contaminant concentrations. This resistance was also correlated to a suppression of the aryl hydrocarbon receptor pathway (AHR), as estimated via the activity of a down-stream regulated enzyme – cytochrome Fg50c (CYP4A). To better understand the impacts of this adaptation, we evaluated the cross-resistance and fitness cost of populations to mechanistically and environmentally relevant stressors, but we were unable to confirm any fitness costs. We showed that the heritability of this resistance is biparental and multi-generational, that this genetic trait is inherited by the offspring, and that it is associated with resistance to contaminants. We showed that this genetic trait is associated with resistance to contaminants and that it is inherited by the offspring. We showed that this genetic trait is associated with resistance to contaminants.

Risk to Pollinators Posed by Agrochemical Mixtures From Emitted Feed Yards

Eric M. Peterson, Kimberly J. Wooten, Svennivasan Subbath, Todd A. Anderson, Scott Longing, Philip N. Smith

Insect pollinator populations are declining across the United States. Potential causes of observed declines in insect pollinators include, but are not limited to, native and invasive weed species, habitat loss, monocropping, disease, malnutrition, and pesticides. Livestock production, specifically beef cattle feed yards, involves a variety of veterinary pharmaceuticals and pesticides to enhance growth and health of cattle, and to control unwanted pests and parasites. Since growth promoters and antibiotics have recently been restricted on particulate matter emanating from feed yards, we examined wildflowers and insect pollinators near feed yards in the Southern High Plains for occurrence of antibiotics, beta-agonists, other feed yard-related agrochemicals (avermectins), and neonicotinoids. All wildflower samples contained at least one target analyte, while the majority (52%) contained multiple pharmaceuticals/pesticides including 12% of wildflowers containing antibiotics, ractopamine, moxidectin, and a neonicotinoid. This demonstrates the potential for insect pollinators occurring near feed yards to be exposed to mixtures of feed yard-derived agrochemicals as well as pesticides used on nearby row crops.

Analysis of Incense by Headspace-gas Chromatograph-mass Spectrometer (HS-GC/MS) and Thermogravimetric-Gas Chromatograph-mass Spectrometer (TGA-GC/MS)

Mitchell Schnyder, Mahmoud A. Saleh

Twelve incense samples, six stick incense and six dotrop style, from four different manufacturers were characterized by headspace-gas chromatographymass spectrometry (HS-GC/MS) and thermogravimetric-analysis-gas chromatography/mass spectrometry (TGA-GC/MS) under pyrolysis conditions. Burning incense is a popular practice around the world across all races, religions, ethnicities, nationalities, and ideologies. There are numerous studies which show the chemical composition of incense before burning or after burning. However, there are few studies that investigate the chemical composition both before burning and after burning. A chemical fingerprint for the incense before burning was determined using HS-GC/MS and many hazardous compounds were found. The TGA-GC/MS was used to determine the products of pyrolysis and combustion under helium and oxygen atmospheres respectively. The TGA-GC/MS analysis showed the presence of benzene for four out of six samples and the different chemical compositions of incense before and after burning. The TGA-GC/MS analysis was suspected to be a result of distinct smoke-generating compounds used in the manufacturing of incense. This research provides preliminary evidence on the harmful emission products and their relationship to certain materials used in incense.

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11. Effects of Inorganic Arsenic and BHT/BHA on p53 and MARK Pathway in BEAS-2B Cell
Vidyakiran Polakai, Adinola D. Adejayan, Hoda Elbagh, Shodimu-Emmanuel Olufemi, Desiree A. Jackson
Arsenic is a major environmental contaminant and a major health concern. It exists in both organic and inorganic forms. Inorganic arsenic AsO$_2$ and Na$_2$AsO$_3$ are toxic and implicated in cancer development. This study revealed that antioxidants, butylated hydroxytoluene (BHT) and butylated hydroxyanisole (BHA) ameliorate the effects of arsenic if administered after exposure to arsenic in BEAS-2B cells. BEAS-2B cells were cultured and treated with As$_2$O$_3$ or Na$_2$AsO$_3$ or combinations of inorganic arsenic and BHT/BHA at different dose concentrations, including mock controls. In BEAS-2B cells, the effects of sodium arsenite and arsenic trioxide on p53 and MAPK pathways, as well as the ameliorate effects of BHT/BHA on arsenic, were studied. The results were analyzed using Western blotting analysis. Cell death observed was higher at LD$_{50}$ with 5 μM of As$_2$O$_3$ and 10 μM of Na$_2$AsO$_3$. Prior treatment with BHT/BHA was not protective. Treatment of the cells with either As$_2$O$_3$ or Na$_2$AsO$_3$ followed by BHT/BHA was protective. Results from this study showed activation of p53 and MAPK pathways and in the arsenic 24 h treated cells followed by 24.5 μM BHT/BHA treatment, there was up-regulation of Caspase 3, Bax and C-raf. In Na$_2$AsO$_3$ 24 h treated cells followed by BHT/BHA for 24 h, GADD45 was upregulated, but mock controls showed downregulation. In the Na$_2$AsO$_3$ 48 h treated cells, downregulation of GADD45 was observed. This leads to the findings from this study suggested abrogation of p53 and MAPK pathways by treatment of arsenic alone, but prior arsenic treatment followed by BHA/BHT minimizing arsenic toxicity on the cells.

12. Raising the steaks: A pilot study on the effects of cattle-associated, hormonally-active compounds in Texas watersheds
Kyle Roush, Marlo K. Jeffries
Globally, there is demand for increased meat production. Texas, a leader in cattle production in the United States, has met this demand utilizing confined animal feeding operations (CAFOs) containing hundreds to thousands of cattle. To increase production efficiency, cattle receive growth promoting hormone treatments to enhance growth and increase cattle mass. These hormonally-active compounds (HACs) have been found in cattle waste, feedlot runoff, and surface waters. The ultimate goal of this project was to identify environmental characteristics associated with transport of cattle-associated HACs in surface waters. Therefore, the objectives of this pilot study were to: 1) identify and define a study area for evaluating HACs in Texas watersheds and 2) begin preliminary assessments of HACs in surface water downstream of cattle feedlots. A suitable study site was identified using satellite imagery, elevation data and the ArcGIS hydrology tool pack. Sample sites were selected within this area based on geographical features and position to CAFOs. Caged fish studies, followed by analysis of estrogen-responsive gene expression, were utilized to assess the presence and activity of HACs. Though no statistically significant alterations in estrogen-responsive gene expression metrics were observed, females from three of the four sites downstream of CAFOs experienced 2.9 to 3.7-fold and 1.9 to 5.3-fold decreases in the expression of estrogen receptor α and vitellogenin, respectively. This could have larger implications as previous research by Miller et al. (2007) suggested 25% reduction in vitellogenin plasma concentration could result in up to a 70% decrease in population size.

13. Exposure to the model goitrogen, propylthiouracil (PTU), alters the immune response and pathogen resistance in male fathead minnows (Pimephales promelas)
Merriel C. LeSueur, Leah M. Thornton Marlo K. Jeffries
The sensitivity of the hypothalamic-pituitary-thyroid axis to environmental contaminants and the subsequent effects on growth and development has been well established for many endocrine-disrupting compounds. However, recent studies have suggested that thyroid hormones may play a role in the regulation of immune function. This study sought to determine the impact of propylthiouracil (PTU, a known thyroid inhibitor) on various aspects of immune function in the fathead minnow (Pimephales promelas). To achieve this, male fathead minnows were divided into two groups: a control and a PTU-exposed group. Following a 21 day exposure period, both groups were challenged with Yersinia ruckeri and mortality was monitored for 14 days to assess pathogen resistance. Tissues from the diseased fish were collected, incinerated and the gas evolved was channeled into various test reagents including the filtrate of the yeast bioassay. The results showed that PTU exposure decreased the survival rate of the control group by 50% whereas the PTU exposed group only had a 25% decrease. The sensitivities of the hypothalamic-pituitary-thyroid axis to environmental contaminants and the subsequent effects on growth and development has been well established for many endocrine-disrupting compounds. However, recent studies have suggested that thyroid hormones may play a role in the regulation of immune function. This study sought to determine the impact of propylthiouracil (PTU, a known thyroid inhibitor) on various aspects of immune function in the fathead minnow (Pimephales promelas). To achieve this, male fathead minnows were divided into two groups: a control and a PTU-exposed group. Following a 21 day exposure period, both groups were challenged with Yersinia ruckeri and mortality was monitored for 14 days to assess pathogen resistance. Tissues from the diseased fish were collected, incinerated and the gas evolved was channeled into various test reagents including the filtrate of the yeast bioassay. The results showed that PTU exposure decreased the survival rate of the control group by 50% whereas the PTU exposed group only had a 25% decrease. The sensitivities of the hypothalamic-pituitary-thyroid axis to environmental contaminants and the subsequent effects on growth and development has been well established for many endocrine-disrupting compounds. However, recent studies have suggested that thyroid hormones may play a role in the regulation of immune function. This study sought to determine the impact of propylthiouracil (PTU, a known thyroid inhibitor) on various aspects of immune function in the fathead minnow (Pimephales promelas). To achieve this, male fathead minnows were divided into two groups: a control and a PTU-exposed group. Following a 21 day exposure period, both groups were challenged with Yersinia ruckeri and mortality was monitored for 14 days to assess pathogen resistance. Tissues from the diseased fish were collected, incinerated and the gas evolved was channeled into various test reagents including the filtrate of the yeast bioassay. The results showed that PTU exposure decreased the survival rate of the control group by 50% whereas the PTU exposed group only had a 25% decrease.

14. Toxicity of Poly- and Per-fluorinated Compounds to Northern Bobwhite Quail
William Thompson, Steve Lasse, Serenivasan Subbiah, Mike Wyages, John Kasuma, Todd A. Anderson
The purpose of this study is to determine toxicity reference values (TRVs) for birds for six per- and polyfluoroalkyl substances (PFAS) using Northern Bobwhite (Colinus virginianus) as a model species. PFAS are a class of chemicals characterized by long carbon chains surrounded with fluorine groups used for their hydrophobic and non-reactive properties in firefighting foam and other industrial applications. These compounds have been found to be both widespread and persistent in the environment; while these compounds have been found to be both widespread and persistent in the environment, toxicity of these compounds are not well characterized for non-mammalian vertebrates, including birds. Our study examines the effects of acute oral exposure with six PFAS and the chronic effects of PFAS exposure on growth, development, and survival in Northern Bobwhite. Our acute study determined the LD$_{50}$ using the “Up-and-Down” procedure to minimize number of animals needed in this study. The chronic portion of our study is currently just beginning but will assess toxicity using the survival of dosed adults and their chicks, egg production of breeding pairs, and the growth of chicks over a period of one month.

Green-screen Incineration as a Remediation Option for Plastic Waste Pollution in Nigeria
Oyangnabi Abel-Anjabe, G.A. Odeuche
Solid waste management is a major problem in Nigeria. Heaps of waste materials deface the cities. A large portion of this waste is made up of plastic materials which with other wastes are washed into water bodies and farmlands. In addition, indiscriminate dumping of waste materials has enormous negative impact on the environment, aquatic life and on the quality of life of the people in general. Solid waste compounds are also a breeding ground for mosquitoes and other disease vectors. The reducible odor emanating from the waste dumps is also a source of discomfort for the teeming population. Inappropriate/inadequate technology is listed as some of the factors militating against proper solid waste management in Nigeria, and recycling of waste materials is rarely carried out. Incineration, an controversial as it is, might be the way to go forward. In the short run, it is the option to remediate this problem for the country. To this end an incinerator of simple design has been constructed, using locally available materials, and tested. Polytene waste materials were collected, incinerated, and the gas evolved was channeled into various test reagents including the filtrate of the yeast bioassay (peel) to capture carbon dioxide produced from incineration, thereby protecting the environment from pollution. Pre/post incineration PH analysis of the sample solutions was conducted. The combustion gas turned water weakly acidic and lime was milky. In each case, pH change was in the direction of higher acidity and the incinerator reduced polyethylene waste volume significantly.
1. Evaluation of Anti-proliferation and Cytotoxic Effects of Jegeme Leaf Extract on Human Lung Adenocarcinoma Cell Line (H1299)

Toluwumi O. Adebayo, Momoh A. Yakubu

Jegeme leaf extract is a small free alkaloid, synthesized under LED light. However, it has been used to investigate the cellular and molecular mechanism(s) by which Jegeme extract interferes with proliferation of H1299 as well as its effects on the antiproliferative or the cytotoxic effects of Jegeme. Our findings indicate that Jegeme leaf extract regulates H1299 non-small adenocarcinoma proliferation and survival and it has probable chemotherapeutic effects. However, further research is suggested to investigate the cellular and molecular mechanisms by which this extract interferes with proliferation of H1299 as well as to determine the active alkaloids in Jegeme extract.

2. Biological Effects of Low, Medium, and High Blue-enriched White Light-in Light Emitting Diode (LED) on C. elegans Eleagnus

Aldana Aldawsari, Fawzia Abdel‐Rahman

C. elegans (eleagnus) is a small free‐living and bacterial‐feeder rhabditid nematode. It is a good model to study the effects of light emitting diode (LED) for its biological systems, such as growth, reproduction, and death. This study aims to analyze whether the different effects of LED enriched white light on the nematode C. elegans to the blue‐enriched white light in LED light from egg to adult can impact the biology and behavior of C. elegans. In this analysis, four treatments were prepared to evaluate these effects that were exposed to no light (dark) which is the control, low‐blue enriched, medium‐blue enriched and high blue enriched white LED light sources. The results showed that the low‐blue enriched treatment was very much similar to control. It was evident that in the medium‐blue enriched, the worms showed significant biological differences; however, it was much higher in the high blue LED enriched treatments. The reproduction was very low by day 6 with 68 total progeny in medium‐blue LED; however, in high‐blue enriched was much lower, 20 total progeny versus the control with 159 progeny. The findings of this study showed that blue enriched white LED light can decrease the reproduction, cause late hatchng and development to adults, slow locomotion, less heat/cold tolerance, and induce generation of reactive oxygen species (ROS) on C. elegans that were developed under LED light.

3. Predicting the Effect of P luorouracil on Loggerhead Sea Turtle Cells by Computational Model

Joeclin D. P ierro, Angela L. Peace, Sarah J. Webb, Céline A. J. Godard-Cudding

Little toxicological research has been conducted on loggerhead sea turtles (Carett a caretta). This study, targeted in vitro modeling from loggerhead shell from loggerhead shell exposed to perfluorooctanoic acid (PFOA) in a known perfluorocarbon containing derivative (KMEG) to confer protection from radiation and restore normal immune function was investigated following exposure to PFOA during the first month of life. Our data suggest that Jegeme leaf extract regulates H1299 non-small adenocarcinoma proliferation and survival and it has probable chemotherapeutic effects. However, further research is suggested to investigate the cellular and molecular mechanisms by which this extract interferes with proliferation of H1299 as well as to determine the active alkaloids in Jegeme extract.

ABSTRACTS FOR POSTER PRESENTATION

10. Blood Cholesterin (Chol) as a Biomarker to Monitor the Exposure of Northern Bobwhites (Colinus Virginianus) to Blood ChE Inhibiting Chemicals in the Rolling Plains Ecoregion of Texas and Oklahoma, USA

Sara A. Papas, Uday Turaga, Nicholas R. Dunham, Naaman Kamar, and Ronald J. Kendall

In an effort to identify factors contributing to the population decline of Northern bobwhites (Colinus virginianus) in the Rolling Plains ecoregion of Texas and Oklahoma, blood samples were collected from quail during the summer (August) and fall (October) of 2013. The blood samples were analyzed using a spectroscopic method to quantify blood cholesterinase activity of the specimens, a biomarker of exposure to blood cholesterin inhibiting chemicals. Significant differences in the blood cholesterinase activities of penned and wild bobwhites were observed. More importantly, significant differences in the blood cholesterinase activities of bobwhites based on age were observed in the case of wild bobwhites. Additionally, juvenile male and female bobwhites in the wild were found to have a significantly higher blood cholesterinase activity compared to their adult male and female counterparts. A significant decrease in the blood cholesterin activity of the wild bobwhites did reveal an exposure to blood cholesterin inhibiting chemicals in the Rolling Plains ecoregion.
7. Morphological Effects of Alpha-solanine, 2-Propanenamide and Inorganic Arsenic in Beas-2B Cells
Hoda Eltanag, Leandra Stewart, Admola Adejayan, Vidigakom Polaki, Desiree A. Jackson, Shodimu-Emmanuel Olaofe

Toxins and antagonists were found in consumer products, household materials, and the environment. This study revealed that morphological characteristic can be used to determine individual effects of toxins and antagonists in Beas-2B cells. Beas-2B cells were treated individually with four different toxins, α-solanine, 2-propanenamide, and inorganic arsenic (NaAsO₂ and As₂O₃) and/or combination of the toxins and the antagonists (butylated hydroxyanisole (BHA; 2,3-,4- and 6-Butyl-4-hydroxyanisole), and butylated hydroxytoluene (BHT; 2,6-Di-tert-butyl-4-methylphenol)). The effects of the toxins and the antagonists on cellular morphology were analyzed under a Nikon Eclipse Ti microscope. Cells treated with α-solanine displayed narrowed elongated cell-like structure with altered cellular morphology. On the other hand, 2-propanenamide treated cells crumpled into cobble-like pockets with blebbing-like structure. While NaAsO₂ and As₂O₃ treated cells showed mostly apoptotic and necrotic blebbing-like structure. Even in the presence of antagonists (BHA and BHT), the altered cellular morphology changes were minimal. These findings suggest that cellular morphological changes may be used to ascertain individual toxicant and antagonist effects in cells.

8. Epigenetic Modification of Histone 3 by Acrrolein in Rat Vascular Smooth Muscle Cells
Mahsa Esmaeili, Zivar Yousefpour, Omana Philips, Kasturi Ranganna, Mathew Joseph

Environmental pollutants can exacerbate disease conditions by affecting chromatin structure and ultimately regulating gene expression. Acetylation of histone lysine has been reported to contribute to gene expression while the methylation results in gene inactivation. Acrrolein, an environmental pollutant and a major component of cigarette smoke, has been implicated in cardiovascular toxicity and several neurological disorders such as Alzheimer’s disease. N-acetyl cysteine (NAC), a precursor of glutathione, has been reported to prevent acrolein toxicity in cells. The goal of the present study was to investigate the effects of acrolein on modification of histone 3, lysine 9 residue (H3K9) in rat’s vascular smooth muscle cells (VSMCs) in the present and absent of NAC. VSMCs were treated with 2 and 3 μg/ml of acrolein for 5, 6 and 24 hours in the presence or absent of 0.2 mM NAC. At the end of the treatment, MTS assay was used to check cell viability. Western blot analysis was used to determine changes in H3K9 tri-methylation and acetylation. Additionally, immunofluorescence staining was used to analyze cellular localization of H3K9 acetylation and methylation. Cells treated with 2 and 3 μg/ml of acrolein exhibited the highest toxicity at 6 hours incubation. Acrrolein exposed VSMC displayed induction of histone H3K9 acetylation for all concentrations and time periods. The most significant induction of acetylation (30% at 2 μg/ml and 46% at 3 μg/ml) and tri-methylation (37% at 2 μg/ml & 45% at 3 μg/ml) occurred at 6 hours incubation. Co-treated VSMCs with acrolein and N-acetyl cysteine reduced H3K9 acetylation (100% for both 2 and 3 μg/ml), and tri-methylation (150% & 120% for 2 and 3 μg/ml respectively). Immunofluorescence staining further confirmed changes in acetylation and tri-methylation in acrolein treated VSMCs with or without NAC. Based on our data we are concluding that effect of acrolein on VSMCs is partially due to alterations of H3K9 methylation and acetylation which can be diminished with addition of 0.2 mM NAC.

9. Selenium Countering Effects of Mercury Induced Liquid Profiling in Free Living Natematode Caenorhabditis elegans
Sakha Jamadar, Kevin Anthony, Duma Hlangathi, Faustia Abdel-Rahman

Exposure to mercury (Hg) is a serious threat to public health. Organomercuric compounds such as phenyl mercury acetate (PMA) can cause harmful damage to the nervous system. Caenorhabditis elegans (C. elegans) studies showed that mercury exposure induces neuron degeneration likely due to the increase in reactive oxygen species (ROS). Selenium (Se) is an essential trace element required for activity of many antioxidant enzymes. Accordingly, Se is capable of decreasing deposition of Hg during co-exposure possibly due to the high affinity between Hg and Se and reducing the ROS level by activating antioxidant enzymes. C. elegans was used to compare the induced ROS level following co-exposure to PMA and Se, and also was utilized to identify the antioxidant effect of Se on PMA induced lipid profiling at a sub-exposure possibly due to the high affinity between Hg and Se and reducing the ROS level by activating antioxidant enzymes. Hg-exposure induces neuron degeneration likely due to the increase in reactive oxygen species (ROS). Selenium (Se) is an essential trace element required for activity of many antioxidant enzymes. Accordingly, Se is capable of decreasing deposition of Hg during co-exposure possibly due to the high affinity between Hg and Se and reducing the ROS level by activating antioxidant enzymes.