

## CEG Members Awarded R21 and R01 Funding from NIEHS

We congratulate CEG members **Chia-I Ko, PhD**, and **Kelly Brunst, PhD**, on receiving major new awards from the National Institute of Environmental Health Sciences (NIEHS). Dr. Ko, an assistant professor in the Department of Environmental and Public Health Sciences, has been awarded a quarter of a million dollars in year 1 for her study, “**Disruption of Pluripotency by Dioxin Exposure,**” **R21 ES031190**, project start date: 7/1/2020, end date: 6/30/2022; total 2020 funding: \$240,750 (direct costs: \$150,000). Dr. Brunst, an assistant professor in the Division of Epidemiology, has been awarded more than a half million dollars in year 1 for her 5-year R01 study, NIEHS **R01 ES031054**, “**Epigenetics, Air Pollution, and Childhood Mental Health,**” project start date 7/2020;enddate:4/30/2025;total2020funding:\$632,113(directcosts:\$486,168).



Chia-I Ko, PhD

Ko’s study will use an advanced 3D chromatin structure approach to study toxic effects in pluripotency networks resulting from environmental exposure. Dr. Ko’s *in vivo* model is expected to lead to better understanding of the mechanisms of developmental toxicity of dioxins, making it possible to arrive at prevention and intervention approaches to deal with embryonic environmental injury. Dr. Ko seeks to identify a link between pluripotency loss and genome-wide chromatin interaction changes, which will provide the foundation to determine how these changes influence embryonic development *in utero*. Earlier this year Dr. Ko received a \$15,000 Pilot award (innovator award category) from the CEG for her project, “Disruption of pluripotency and differentiation of preimplantation embryonic cells by dioxin exposure.”

As described in her proposal to NIEHS, Brunst’s study seeks to determine whether exposure to fine particulate matter (PM2.5) and traffic-related air pollution (TRAP) during childhood and adolescence impacts the epigenome and whether changes in DNA methylation can be used to identify children at increased risk for anxiety and depression. Using the Cincinnati Childhood



Kelly Brunst, PhD

Allergy and Air Pollution Study (CCAAPS) and Health Outcomes and Measures of the Environment (HOME) study birth cohort, the Brunst team will (1) conduct an epigenome-wide search for DNA methylation biomarkers associated with PM2.5 and TRAP exposure prenatally through age 12 years (n=500) and (2) identify unique and pollution-related DNA methylation signatures associated with anxiety and depression. The Brunst team will aim to replicate its findings in a third, independent birth cohort, Project Viva (n=652), with similar sociodemographic characteristics and available air pollution and neurodevelopmental outcome data. The study design, based on three well-established birth cohorts with nearly 2 decades of follow-up, will allow for longitudinal and cross-sectional analyses of air pollution, DNA methylation, and mental health assessments. Dr. Brunst is a former CEG New Investigator Awardee (2018 – 2020) and recent CEG Pilot project recipient: 2018 New Investigator Award (NIA) “Epigenetic mechanisms linking traffic-related air pollution and brain structure and function (\$40,000) and 2020 Innovator Award, “Fluoride exposure, mitochondrial function and mental health” (\$29,465).



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