Research Experience and Training Coordination Core [1]

The overall goal of the Research Experience and Training Coordination Core (RETCC) is to develop trainees that are uniquely qualified to solve current and future environmental problems due to their cross-disciplinary and holistic education, research skills and social understanding. The Research Experience and Training Coordination Core created and assembled a catalog of specially designed didactic and laboratory courses, workshops, and seminars. These bring trainees from all ISRP research projects together to acquire basic knowledge in complementary disciplines, get insight into research methods, risk assessment, data management and analysis, ethical considerations, and other overarching aspects of environmental pollution research and prevention/mitigation. They will do this by:

1) Identifying, promoting, evaluating, and tracking an interdisciplinary approach to training.

All trainees participate in the monthly ISRP meeting where they take turns presenting their results to the interdisciplinary ISRP group. The talks and lively discussions introduce our trainees to question, views and emphasis of researchers from the other disciplines. Our trainees also participated in the annual CS-SOT and SETAC meetings where they presented their data to the larger research community. This was also an opportunity to make new connections and to learn about newest research and techniques in their own and related
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fields.

A highlight was the External Advisory Committee (EAC) Meeting in October. The External Advisors are a group with multidisciplinary expertise who work in academia and government. They specifically asked for extended time to interact with the trainees. On the 2 days of the meeting 14 trainees delivered oral presentations. The External Advisors provided valuable feedback from the view of researchers and stakeholders (EPA and others) for our trainees. Trainees are also encouraged to take courses in other disciplines.

2) Coordinating training in ISRP methods and application

The ISRP is highly interactive beyond disciplines. Students can always approach researchers for training and access to equipment. The COVID-19 pandemic resulted in a temporary shutdown of lab research and reduced occupancy in labs after reopening for research. Nevertheless, particularly the Analytical Core and Synthesis Core are making sure that students who want to learn such techniques will obtain the necessary training.

In addition, students participate in the lab meetings of these groups to be involved in discussions and problem-solving approaches. The best indication for this coordinated working is visible in the author lists of the publications and presentations, which usually include members affiliated with different projects and cores. This cooperation in research and lab training between projects and cores has always been an exceptionally strong part of the ISRP and continues to be so in the new cycle.

3) Coordinate opportunities for trainee participation in the Community Engagement Core (CEC) and the Research Translation (RT) activities

The COVID-19 pandemic prevented any outreach activities that required direct person-to-person contact. This had a negative effect on any opportunity for our trainees to meet and work with communities. The Community Engagement Core (CEC) under the leadership of Brandi Jansen continued their interactions with schools in Iowa and it is expected that soon interactions in larger groups via zoom will be possible. Our trainees are expected to participate in these activities once there are offered again.

Several trainees worked with the Research Translation Coordinator, Dr. Scott Spak, and got training and insight into research dissemination among the interested public via 3 Minute Presentations-including to the EAC. It is expected that participation of our trainees in CEC and RT activities will increase as soon as the pandemic is overcome.

4) Interact with the Data Management and Analysis Core (DMAC) to provide training in data management, analysis, and data sharing.

Several trainees took advantage of the new “Managing Data to Facilitate Your Research” course. This one s.h. course is offered by ISRP members Brian Westra and Marina Zhang. Many of our trainees also participate in the weekly DMAC (data management and analysis core) seminars. In these seminars, the ISRP biostatisticians Michael Jones and Kai Wang explain approaches and techniques to data analysis; students present their findings, which are then discussed with respect to appropriate statistical test methods and more. Another focus is also to make data FAIR (findable, accessible, interoperable, and reusable). Four data sets have been published by the ISRP. 1. Bako, C.M.; et al. “Biodegradation of PCB Congeners in Wastewater Lagoon Sediment” (Dataset), In Press. 2. Saktrakulkla, P.; Lan, T.; Hua, J.; Marek, R.F.; Thorne, P.S.; and Hornbuckle, K.C. “Dataset for PCBs in Food” (dataset) 2020 Iowa
Research Online. [https://doi.org/10.25820/data.001112] [5]
3. Wang, H., et al. "Toxicity assessment data from subchronic inhalation exposure to a school air mixture (SAM) of PCBs" (dataset) 2020, University of Iowa. [https://doi.org/10.25820/data.006120] [6] Li, X., Zhang, C., Wang, K., & Lehmler, H. (2020). Dataset: Fatty Liver and Impaired Hepatic Metabolism Alter the Congener-specific Distribution of Polychlorinated Biphenyls (PCBs) in Mice with A Liver-specific Deletion of Cytochrome P450 Reductase. University of Iowa. [https://doi.org/10.25820/data.006117] [7], three of them with trainees as first author. This approach of a course and seminar/workshop series seem to be working well.

5) Provide opportunities to enhance trainees' professional career development.

Trainees have a multitude of opportunity to enhance their job preparedness. The weekly Human Toxicology/ISRP/EHSRC [8] seminar specifically included seminar topics and workshops for professional development. Another opportunity to gain insight into the transition into the workforce and was provided by the Professional Development course, (ISRP member Prof. Peter Thorne, course director) which is required for 1st year Human Toxicology students but open to all graduate students. This course featured talks from our alumni who now work in government, industry, or academia. Drs. Claire Doskey, William D. Klaren, PhD, James Jacobus, PhD, Andrea Adamcakova-Dodd, PhD, Brita Kilburg-Basnyat, Fabian A. Grimm, PhD, and Wen Xin Koh described their work and how they transitioned into it. These workshops, seminars, and courses are excellent tools to prepare our trainees for a career.

The Research Experience Training and Coordination Core is working with trainees, Projects, and Cores to ensure rigor and transparency in not only research but also training processes. Trainees present their research many times in many different settings and formats including the weekly DMAC/AC meetings, the monthly ISRP meetings, conferences, etc. They also work with the DMAC and AC to publish their data in open repositories, on the ISRP website, etc. The multidisciplinary approach of the RETCC also insures trainees are viewing their research from many different disciplines and perspectives.

**Trainee Video:** Below former trainee Nick Herkert describes his experience working in Project 4. Nick is now a Research Project Manager at Duke University.

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**Gabriele Ludewig, PhD, Core Leader**

Dr. Ludewig is a professor in the College of Occupational and Environmental Health and is the Director of Graduate Studies for the Human Toxicology Program at the University of Iowa. She is a member of the Diversity Committee of the College of Public Health at the University of Iowa. In 2016 she won the prestigious John Doull Award by the Central States Society of Toxicology. Dr. Ludewig oversees, plans, and coordinates all aspects of the ISRP Training Program.

**James Ankrum, PhD, Co-Investigator**

Dr. Ankrum is an Assistant Professor in Biomedical Engineering at the University of Iowa. He is a
Co-Investigator for Project 1 of the ISRP. Dr. Ankrum is a researcher for the Center for Computer-Aided Design, the Fraternal Order of the Eagle Diabetes Research Center, and is a member of the Pappajohn Biomedical Institute.

Jonathan Doorn, PHD, Co-Investigator

Dr. Doorn is Professor in Pharmaceutical Sciences and Experimental Therapeutics and is the Division Head, Department of Pharmaceutical Sciences and Experimental Therapeutics / Division of Medicinal and Natural Products Chemistry at the University of Iowa. He is Co-Investigator of Project 1 of the ISRP. He was awarded the 2019 University of Iowa College of Pharmacy Award for Teaching Excellence.

Greg LeFevre, PhD, Co-Investigator

Dr. LeFevre is an Assistant Professor in Civil and Environmental Engineering at the University of Iowa. He is a researcher at the IIHR -- Hydrosience & Engineering, Center for Biocatalysis and Bioprocessing, and the Center for Global & Regional Environmental Research. He is a Co-Investigator for Project 5 of the ISRP. In 2019 he was awarded a National Science Foundation’s prestigious CAREER award for his stormwater research.

Brian Westra, MS, Data Librarian

Brian is the UI Libraries Data Services Manager. He leads development of institutional data services, infrastructure, and policies. He has 20 years of experience in data management and data services development, implementation, and training. Brian will lead Aim 4 implementation but will also assist with the other RETCC Aims.