

life, or schistosomiasis vectors. **DISCUSSION/SIGNIFICANCE:** For the first time, high-detail maps of cellular signal and critical schistosomiasis-related landmarks were generated. Future work on this project is focused on training computer vision algorithms using the captured images of environmental and ecological factors to isolate possible areas of human disease transmission.

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### **Role of Neurocritical Care Physicians in Traumatic Brain Injury Systems of Care and Research: Perspectives from Provider Surveys**

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**OBJECTIVES/GOALS:** The purpose of this small survey-based study was to characterize the current role of neurocritical care physicians in traumatic brain injury (TBI) systems of care and research. In doing so, we aim to highlight potential roles of neurology providers in the medical management and enhancement of translational science in the field of TBI. **METHODS/STUDY POPULATION:** Between April and June 2021, a web-based survey was disseminated by email to members of the Neurocritical Care Society. The survey was open to all physician providers. A total of 36 surveys were completed. The survey consisted of 18 questions with pre-defined answer choices. Survey questions aimed to determine areas of practice, primary clinical specialty, hospital practice setting, provider involvement in TBI care, provider involvement in TBI research, and current research roles. **RESULTS/ANTICIPATED RESULTS:** 92% of survey respondents were in the United States (n=33), representing all national regions. 75% of the physicians were neurocritical care trained (n=27). 69% of providers were practicing in academic institutions while 78% were at sites designated as Level I trauma centers. All respondents managed acute TBI, but 50% served as consultants rather than being the primary service provider. At their sites of practice, 31% of patients were on non-neuroscience services, especially those with non-neurologic traumatic injury. Only 36% reported that TBI protocols were written and adhered to at their site. Only 44% reported that TBI research was performed at their site, while 50% had interest in participating in TBI research. TBI was the primary area of research for 17% of physicians. **DISCUSSION/SIGNIFICANCE:** This small physician survey highlights heterogeneity in TBI systems-based practice and research roles. Areas of potential improvement include greater involvement of neurocritical care physicians in TBI management, protocol-building and implementation, and TBI research. Reasons for current barriers are multifactorial and will be discussed.

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### **The Need for a Clinical and Translational Science Framework to Bridge Environmental Contamination Data and Male Reproductive Health**

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**OBJECTIVES/GOALS:** Although there is ample evidence that environmental contaminants impact reproductive health, the exact mechanisms of action, for the most part, remains unclear. We sought to determine whether known contaminants in Puerto Rico can contribute to the selection of a bioassay to add granularity to geospatial

contamination data at the cellular level. **METHODS/STUDY POPULATION:** A PubMed literature search was conducted: Puerto Rico AND Vieques AND Environmental Contaminants AND Heavy Metals OR Phthalates OR Metals OR PCB OR Air Pollution OR CVOC. Additional inclusion criteria were free full text, English language and year of publication between 2000 to 2022 (n = 244 studies). References that were not related to Puerto Rico and environmental contaminants in air, soil, water, or vegetation were excluded. A second PubMed literature search was conducted to determine whether a clinical link has been established between contaminant exposure and the male reproductive system. Search terms were: heavy metals AND hypospadias OR cryptorchidism NOT female NOT animal NOT review, heavy metals AND male infertility NOT female NOT animal NOT review. The same strategy was used for phthalates. **RESULTS/ANTICIPATED RESULTS:** We found that 12 out of 15 studies that were conducted in the Archipelago of Puerto Rico between 2000-2022 reported heavy metals- and/or phthalates-contamination in soil and water. We also found that there is a paucity of clinical studies that consider plausible relationships between a given contaminant and congenital conditions or male reproductive function. Specifically, we found that heavy metal exposure has been linked to hypospadias (n=1 study), comorbidity of hypospadias plus cryptorchidism (n= 1 study) or male infertility (n=14 studies). Phthalates exposure has been linked to comorbidity of hypospadias and cryptorchidism (n=1 study) or male infertility (n=1 study). Male subfertility has been overlooked so far. We noted that Sertoli cell dysfunction has been linked to all of these conditions. **DISCUSSION/SIGNIFICANCE:** The geography of Puerto Rico provides an opportunity to close the gap in knowledge between environmental contamination and male reproductive health. Based on our findings, we propose that the use of a bioassay with an immortalized Sertoli cell line can uncover the cellular processes that may be affected in male reproduction upon contaminant exposure.

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### **The Social Responsibility of Translational Science**

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**OBJECTIVES/GOALS:** Recent NCATS funding announcements emphasize pursuing domain-agnostic translational science projects that seek to transform the system of science. We aimed to articulate the social responsibility of translational science, defined as prioritizing improved health outcomes and decreased disparities. **METHODS/STUDY POPULATION:** We focused on the framing of social responsibilities of translational science and distinctions between (a) domain-agnostic translational science that aims to transform the system of science and (b) translational research that takes place within a specific therapeutic area. We reviewed CTSA funding calls, translational research ethics papers, and statements by leaders in the field of translational science. We integrated the social responsibilities of improving health outcomes and decreasing disparities with the values of translational science, which prioritize the relevance, usability, and sustainability of translational interventions. **RESULTS/ANTICIPATED RESULTS:** We drew on our review of the literature and case studies to offer guidance aimed at helping to ensure that differently positioned actors and entities within the translational ecology can advance the values of translational science while also fulfilling the social responsibilities of translational science. We specify how (a) Funders and policymaking institutions, (b) Organizations such as

research universities and CTSA institutes, (c) Translational health science teams working on innovative translational science projects, and (d) Individual translational scientists can all contribute to ensuring that translational science fulfills its ethical obligations and social responsibilities. **DISCUSSION/SIGNIFICANCE:** The social responsibility of translational science can be fulfilled by centering its efforts to develop useful, sustainable, and relevant innovations. These criteria clarify how social responsibilities manifest in practice and can help funders shape and guide the next era of translational discovery.

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### **Tools to facilitate participant recruitment into research studies: Assessing early outcomes following implementation**

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**OBJECTIVES/GOALS:** The objective of this presentation is to describe different recruitment tools implemented by the Miami Clinical and Translational Science Institute (CTSI) to facilitate participant recruitment into research studies. **METHODS/STUDY POPULATION:** Participant recruitment is critical to the success of all research studies. In the effort of advancing clinical and translational science and to help investigators recruit volunteers for research studies, the University of Miami has two recruitment tools: 1) Consent to Contact (CTC), an opt-in research registry where University of Miami Health System patients are asked for permission to be contacted about studies matching their demographic and/or health profiles; and 2) UMiami HealthResearch.org (UMHR), implemented with the Michigan CTSA, a community-based registry for volunteers to sign up and be contacted about studies. Study investigators can use these tools once they have obtained IRB approval for their research. **RESULTS/ANTICIPATED RESULTS:** The CTC was launched in 2016; to date, over 130,000 patients have enrolled in CTC; 69 studies have been approved with over 75,000 patients' contact information released to study teams. UMHR was launched in 2020. To date, the site lists 237 studies. A total of 2,727 portal visitors have expressed interest in participating in specific studies. Study team members were successful in engaging interested participants, and enrolling participants into studies. Overall, teams reported a positive impact on recruitment. Data collection on utilization and satisfaction of these recruitments tools is ongoing. In addition, focus groups of study team members are being conducted to identify best practices for using these tools, and findings will be presented. **DISCUSSION/SIGNIFICANCE:** The CTC and UMHR recruitment tools have demonstrated positive impact in helping study teams identify potentially eligible research volunteers. The continued promotion of these tools at the University of Miami Health System and in the community will be crucial to the recruitment process and execution of research studies.

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### **Wnt signaling attenuates mechanotransduction and protects against wound occlusion-mediated abolishment of regeneration**

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**OBJECTIVES/GOALS:** Current clinical practice recommends occlusive dressings (e.g., film and hydrocolloid) for wounds with variable

regenerative capacities. However, clinical evidence suggests that occlusion may hinder regeneration. Our objective was to test the impact of occlusion on regeneration using animal models. **METHODS/STUDY POPULATION:** The murine wound-induced hair neogenesis (WIHN) is a well-established model of regeneration characterized by de novo hair follicle (HF) formation in the center of large full-thickness wounds. The quantity of neogenic HFs depends on the robustness of Wnt signaling. Optimal tissue mechanics is also required for WIHN. Utilizing the murine WIHN model, we tested the hypothesis that wound occlusion impedes regeneration. We determined how (i) the timing and duration of wound occlusion impacts WIHN, (ii) Wnt signaling influences the occlusion-induced effects on regeneration and (iii) occlusion alters the tissue mechanics of the wound, which establishes the morphogenetic field needed for WIHN. **RESULTS/ANTICIPATED RESULTS:** Occlusion completely eliminated WIHN. Only a brief period of occlusion between post-wound days 0-3 or 4-7 was sufficient to abrogate WIHN. Microarray and qPCR of open and occluded wounds demonstrated that occlusion promotes fibrosis by upregulating TGF- $\beta$ 2 and mechanotransduction, a mechanosensitive profibrotic pathway. Recruitment of these potent profibrotic pathways generated a symmetrically rigid wound incapable of de novo HF regeneration. Using transgenic animal models with enhanced Wnt signaling, we determined that the ligand-dependent Wnt signaling protected against the occlusion-induced inhibition of WIHN, as well as the occlusion-induced upregulation of both profibrotic pathways. **DISCUSSION/SIGNIFICANCE:** In animal models, occlusion promoted fibrosis at the expense of regeneration during acute wound healing. Augmented Wnt signaling protected against this effect. Occluding wounds may reduce regeneration. Further studies are warranted to validate these findings.

## **Education, Career Development and Workforce Development**

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### **A follow-up evaluation of an expanded good clinical practice online training course: The relevance of community engagement to health research study teams.**

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**OBJECTIVES/GOALS:** This study evaluates the impact of an updated and expanded training for social and behavioral health researchers. Participants' experience with training modules focused on community engagement is a focus of this evaluation as is the application of this training by participants in teams. **METHODS/STUDY POPULATION:** The Social and Behavioral Research training series for health researchers and team members was first created by faculty and staff of the Michigan Institute for Clinical and Health Research in 2018. This training was updated and expanded in 2021 with support from the National Institutes of Health to include new material regarding community-engaged health research as well as updates concerning technology and new federal regulations. Past participants of the training were invited to retake the training, as were clinical and translational researchers at University of