Portland State University (PSU), to create a new model of research training for underrepresented and disadvantaged students. This model provides an opportunity to learn about clinical and translational research academic careers; participate in a research enhancement and professional development curriculum;have a long-term authentic research experience; and receive enhanced mentorship. BUILD EXITO includes PSU, and local and 3 US Pacific territory 2-year colleges. We have developed a sustainable plan that includes these core elements after NIH support for the program ends. We have tracked long-term student outcomes for entry into graduate programs and the research workforce. RESULTS/ANTICIPATED RESULTS: We will describe the experimental model and the network of university and community colleges in BUILD EXITO, including PSU, U of Alaska, and colleges in US territories of Guam, Northern Mariana Islands, and American Samoa. All these universities and colleges have high proportions of underrepresented and disadvantaged students. We will present data on characteristics of the >600 students who have participated in BUILD EXITO to demonstrate the diversity of the cohort. We will also describe 4-year degree completion, engagement in the research workforce, and entry into graduate or professional programs. We will show how this has positively affected faculty inclusion of students in research, institutional policies at the 2-year and 4-year programs, and how this model has become sustainable. DISCUSSION/SIGNIFICANCE: The BUILD EXITO program developed as a collaboration of the CTSA hub at OHSU and a highly diverse undergraduate programs. We have developed a successful model for training a diverse research workforce and will disseminate this sustainable model.

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The Crosstalk between Mitochondrial Dysfunction and Neurodevelopmental Outcomes in Preterm Infants with Pain/Stress in the NICU*

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OBJECTIVES/GOALS: Early life pain/stress impacts infants' neurodevelopmental outcomes. Mitochondrial dysfunction may interface between infants' stress and neurodevelopment. The study aims to investigate the associations between pain/stress, proteins associated with mitochondrial dysfunction, and neurobehavioral responses in preterm infants. METHODS/STUDY POPULATION: A prospective cohort study was conducted with 33 preterm infants enrolled between September 2017 and July 2022 at two affiliated NICUs in Hartford and Farmington, CT. Daily pain/stress experienced during NICU was documented. At 36-38 weeks post-menstrual age (PMA), neurobehavioral outcomes were evaluated using the NICU Network Neurobehavioral Scale (NNNS) and buccal swabs for Mass spectrometry-based proteomics analysis. Lasso statistical methods were conducted to study the association between protein abundance and infants' NNNS summary scores. Multiple linear regression and Gene Ontology (GO) enrichment analyses were performed to examine how clinical characteristics and neurodevelopmental outcomes may be associated with protein levels and underlying molecular pathways. RESULTS/ANTICIPATED RESULTS: During NICU hospitalization, preterm premature rupture of membrane (PPROM) was negatively associated with neurobehavioral outcomes. The protein functions, including leptin receptor binding activity, glutathione disulfide oxidoreductase activity, and response to oxidative stress, lipid metabolism, phosphate, and proton transmembrane transporter activity, were negatively associated with neurobehavioral outcomes. In contrast, cytoskeletal regulation, epithelial barrier, and protection function were found to be positively associated with neurodevelopmental outcomes. In addition, mitochondrial dysfunction-related proteins (SPRR2A, PAIP1, S100A3, MT-CO2, PiC, GLRX, PHB2, and BNIPL-2, ABLIM1, UNC45A, Keratins, MUC1, and CYB5B) were found to be associated with neurobehavioral outcomes. DISCUSSION/SIGNIFICANCE: Mitochondrial dysfunction-related proteins were observed to be associated with early life pain/stress and neurodevelopmental outcomes in infants. Buccal proteins could be used to predict potential neurobehavioral outcomes. In addition, individualized skin integrity protection should be provided to preterm infants during their NICU stay.

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Using LGBTQ+ Community Expertise to Co-Develop Inclusive Sexual Orientation and Gender Identity (SOGI) Screening for Research Studies

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OBJECTIVES/GOALS: To promote diverse research engagement and address health disparities by creating an inclusive tool to collect sexual orientation and gender identity (SOGI) data from potential participants #_msoanchor_1 METHODS/STUDY POPULATION: The Penn State Community Health Equity & Engagement in Research (CHEER) team, part of our Clinical and Translational Science Institute (CTSI), developed inclusive screening guidance to collect SOGI data from potential research participants to fill an identified gap in the literature. Guidance was developed through an iterative feedback process, leveraging expertise from local, regional, and national organizations, healthcare systems, and leaders throughout Clinical & Translational Science Award hubs. By eliciting expert feedback, CHEER co-developed a comprehensive SOGI data collection form, filling an important gap of inclusivity in the consenting process. Training of this new tool was delivered to CHEER's far-reaching listserv researchers (internal and external) and community partners. RESULTS/ANTICIPATED RESULTS: Feedback collected from our LGBTQ+ expert partners resulted in a total of five inclusive SOGI screening questions; two 'Gender Identity' questions, one 'Sexual Orientation' question, and two 'Sex' questions, with "prefer not to answer" and "another option not listed" provided. The goal of this effort is to equip research teams with a tool that integrates SOGI characteristics that may be particularly important to determine study eligibility

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respective to a person's identity or orientation. Additionally, collecting SOGI data in an inclusive way may increase trust worthiness in research from potential research participants, particularly among the LGBTQ+ community, who have been underrepresented yet experience several inequities and disparities across multiple health outcomes. DISCUSSION/SIGNIFICANCE: CHEER's goal is to reduce health disparities in underrepresented populations, including the LGBTQ+ community, by promoting inclusivity and engagement in research. Developing a community-driven screening that addresses the unique needs of the LGBTQ+ community successfully bridges a gap in equity across all research participants.

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The Impact of Race and Social Determinants of Health on Clinical Outcome of Glioblastoma Multiforme Patients Over a Decade.

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OBJECTIVES/GOALS: While the evolving treatment paradigm for Glioblastoma (GBM) leverages different modalities to improve outcomes, treatment access might be limited by cost and disparities. This study explores the influence of race and social determinants of health (SDoH) on healthcare access and outcomes of GBM patients in a large metropolitan area over a decade. METHODS/STUDY POPULATION: Our institution's tumor registry (2009-2019) was queried to identify our GBM cohort. Data were supplemented by electronic health records to include demographics, outcome, NCI Comorbidity Index, and the Agency for Healthcare Research and Quality (AHRQ) socioeconomic status (SES) index. RESULTS/ANTICIPATED RESULTS: Of the 559 GBM records, 361 unique patients met the inclusion criteria, and 43% were Non-White. Non-White patients predominantly comprised the lowest AHRQ SES index quartile and had longer hospital stays (LOS; $p<0.001$). White patients accounted for 61% of privately insured patients ($p<0.001$). Private insurance ($p= 0.02$) and age < 65 years ($p= 0.039$) were associated with a higher rate of home discharge. Patients diagnosed with GBM in the emergency department were more likely to be discharged to acute rehab than home ($p<0.001$). At 2 years, privately insured patients had longer OS (HR= 1.46; $p= 0.04$). DISCUSSION/SIGNIFICANCE: In contrast to previous studies, the study demonstrates that GBM affected a higher proportion of Non-White patients. Our data show that SDoH influences multiple outcomes in GBM patients. Efforts to identify and correct these barriers are needed to improve the care of all GBM patients.

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Participation of Racial and Ethnic Minorities in Decentralized Trials: The ACTIV-6 Experience

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OBJECTIVES/GOALS: Racial and ethnic minority populations have been historically underrepresented in clinical trials, which limits the external validity of study findings. We analyze data from the ACTIV-6 trial to assess whether inclusion efforts were effective in increasing participation from minority groups. METHODS/STUDY POPULATION: ACTIV-6 is a decentralized randomized placebo-controlled platform trial investigating repurposed drugs for the treatment of mild to moderate COVID-19. Study participants could either self-refer online or be recruited through a study site. Two inclusion efforts were introduced to increase participation from racial or ethnic minority populations: targeted advertising and outreach, and strategic selection of study sites that serve diverse populations. We assessed the effectiveness of these interventions by analyzing enrollment trends over time. We also assessed whether participants from racial or ethnic minority populations experienced higher loss to follow-up. RESULTS/ANTICIPATED RESULTS: At the start of the trial, enrollment of non-Hispanic White participants outpaced enrollment from racial or ethnic minority populations. At 4 months, only 108 participants (20.5%) were from racial or ethnic minority populations, but greatly increased by 28 months to 3,544 participants (46.4%), nearly half of all participants. This increase was predominantly due to recruitment through study sites rather than self-referral. In particular, certain sites recruited large numbers of minority participants. We also observed that participants from racial or ethnic minority populations were more likely to drop out of the study before receiving the study drug (3% vs 1%). DISCUSSION/SIGNIFICANCE: Our results suggest that strategic site selection is an effective strategy for recruiting a study population that represents racial and ethnic populations. The benefits of targeted advertising and outreach were less clear. Retention efforts remain important to reduce loss to follow-up.

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CUBE: A Collaborative Undergraduate Biostatistics Experience to Bring Diversity and Awareness to the Field of Collaborative Biostatistics

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OBJECTIVES/GOALS: Despite a steady rise of graduate degrees in biostatistics earned in the US, the percent from minorities remains low. This poster will describe the Collaborative Undergraduate Biostatistics Experience (CUBE), an 8-week program aimed to diversify and bring awareness to the field of collaborative biostatistics, from recruitment through evaluation. METHODS/STUDY POPULATION: The CUBE program is funded jointly by the NIH's NIDA/NIAAA (award number: 1R25DA058482-01) and is designed to give underrepresented minority (URM) undergraduate students in STEM the opportunity to engage in a collaborative biostatistics and health data science experience, along with related professional development activities. The program is built on four pillars: 1) training in introductory biostatistics, 2) training in R programming, 3) professional development, and 4) a collaborative research project addressing research questions in various disciplines. The CUBE program was delivered in the summer of 2022 as a pilot to four URM students at Virginia Tech (VT) and the University of Virginia (UVA), with two at each site. In summer 2023, the program was offered to 5 students (3 VT, 2 UVA). RESULTS/ANTICIPATED RESULTS: This poster will provide strategies learned over two summers with respect to recruitment

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