pediatric glioblastoma (GBM) DNAm data [58 female & 91 male IDH wt samples; ages 0.1–21 yrs;], we found 7,371 differentially methylated cytosines (DMCs) at FDR≤0.05. Of the DMCs, 289 had DNAm differences between male and female samples ≥10%. The majority of probes (68%) were in CpG islands, shelves, or shores. We also found 4 differentially methylated regions (DMRs) between sexes (FWER≤0.1). In the adult GBM DNAm samples [32 F & 32 M IDH wt samples; ages 22–75 yrs], we found only 117 DMCs at FDR≤0.05, and no DMRs. In the RNAseq dataset [68 F & 54 M pHGG samples, ages 0.08–30.6 yrs], we found 383 differentially expressed genes (at FDR≤0.05), and 16 of them (4%) overlapped a DMC. DISCUSSION/SIGNIFICANCE OF IMPACT: Our findings demonstrate that pHGG exhibits sex-specific methylome differences. Interestingly, this difference is greater in the pediatric population as compared to adults. The pHGG transcriptome also differs by sex, which may be related to differential DNAm in a minority of cases.

4485

Silicone Implant Shells Increase the Rate of Proliferation of Patient-Derived BIA-ALCL Cells but Not Primary T Cells in an Engineered Biomimetic Breast Platform

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OBJECTIVES/GOALS: We use a tissue engineered, biomimetic, 3D model to study the pathogenesis of breast implant-associated anaplastic large cell lymphoma (BIA-ALCL) by comparing the effect of silicone implant shell on proliferation of patient-derived BIA-ALCL to its precursor T cells within the breast microenvironment. METHODS/STUDY POPULATION: Patient-derived breast tissue was processed for component adipocytes, ductal organoids, and stromal vascular fraction. These were suspended within 50 µl of 0.3% type I collagen matrix to which was added 200,000 cells/mL of either patient-derived BIA-ALCL cells or T progenitor cells. These were then plated into 6mm wells. As a control, both BIA-ALCL cells and T progenitor cells were suspended within type I collagen alone at the same seeding density without breast components. Before plating, wells were lined circumferentially with either textured, smooth, or no implant shell. These were 1cm by 2cm pieces dissected from the whole implant. Wells were imaged using confocal microscopy over 8 days. RESULTS/ANTICIPATED RESULTS: Unstimulated T progenitor cell count showed no significant increase in any of the conditions tested. The change in cell count over 8 days was 3.85% in each condition ($p = 0.3352$). A Tukey's multiple comparison test comparing each condition revealed no significant increase in cell count over 8 days for all six conditions. Notably, our previous studies have shown proliferation of BIA-ALCL cells to be significantly more robust in the biomimetic platform compared to collagen-only groups, regardless of implant shell type ($p < 0.01$). BIA-ALCL cells grew nearly 30% faster in textured and smooth shell biomimetic groups compared to biomimetic wells lacking implant shell. DISCUSSION/SIGNIFICANCE OF IMPACT: Towards elucidating BIA-ALCL's etiopathology, we show that silicone implant shell has a significant effect on proliferation of BIA-ALCL cells, but not their precursor T cells. If breast implant silicone shell is not a sufficient stimulus for T cell proliferation, co-stimulatory factors are required.

4385

The Pain and Social Experiences Project: Understanding the role of interpersonal trauma in pain

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OBJECTIVES/GOALS: Traumatic interpersonal experiences are associated with higher rates of chronic pain, increased pain severity and poorer functioning. The objective of this ongoing project is to obtain prevalence rates for various forms of interpersonal trauma among individuals with chronic pain, and to explore the potential mediating effect of heightened sensory and social sensitivity on the experience of pain. METHODS/STUDY POPULATION: Patients at Michigan Medicine between the ages of 18 and 65 complete an online survey. Patients are being recruited through a tertiary-care, outpatient pain clinic, as well as through an online health research portal. We aim to recruit 700 participants; we currently have 59.6% of our goal ($n = 417$). Participants also have the option to be included in a registry from which we can recruit for future studies. Approximately 85% of our participants have agreed to be in the registry. RESULTS/ANTICIPATED RESULTS: Preliminary data show that, of the 263 (63.4%) participants for whom data on chronic pain is available, 167 (63.5%) report chronic or persistent pain over the previous 3 months. Of these, 54% reported some form of childhood abuse or neglect. Approximately 41% reported four or more adverse childhood experiences. Additionally, of the 122 participants (73%) who were in a current romantic relationship, 20% reported some form of physical violence victimization from their romantic partner. We anticipate that interpersonal trauma will be associated with poorer perceptions of social relationships, higher sensory sensitivity, and higher perceived stress. DISCUSSION/SIGNIFICANCE OF IMPACT: The PASE Project parent study will be used to better understand prevalence rates for various forms of interpersonal trauma in our chronic pain population. Future analyses and studies will explore alternative pathways linking interpersonal trauma to the experience of pain through sensory and social sensitivity, which will inform interventions aimed at reducing pain among patients with a history of trauma.

4168

Understanding ECM-Based Drug Resistivity in Breast Cancer

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OBJECTIVES/GOALS: Cell-cell (CC) and cell-matrix interactions (CM) are known to affect drug sensitivity of cancer cells, but are not effectively recapitulated using 2D platforms. This research aims to determine how cell and matrix interactions confer drug resistivity in 3 distinct culturing models: 2D (no CM/limited CC), 3D spheroids (CC) and 3D fibronectin (both). METHODS/STUDY POPULATION: We examined four breast cancer cell types. The cells were derived from a nonmetastatic primary tumor (HMLE-E2) or overt bone-metastasis (BM). Transglutaminase 2 (TGM2), a matrix crosslinking protein, is overexpressed in metastatic bone tumors and may play a key role in matrix-conferred drug resistivity. In a

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