but the current research demonstrated that 90% of the sample chose to continue working together across disciplines after EAGER awards. Therefore, future research should dedicate more attention to the nontangible benefits members receive in interdisciplinary teams. Moreover, quality measures revealed higher H-indices for multidisciplinary than unidisciplinary journals and conferences. DISCUSSION/SIGNIFICANCE: Our archival results revealed that NSF EAGER grants are having their intended effect of being a catalyst for 1) continued multidisciplinary (and especially multidirectorate) collaboration) and 2) high-quality multidisciplinary publication and conference output. These results have contributed to NSF policy changes to reinstate the EAGER grant.

447

Characterization of the human iridocorneal angle in vivo using a custom design goniolens with OCT gonioscopy

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OBJECTIVES/GOALS: The trabecular meshwork (TM) and Schlemm's canal (SC), located within the iridocorneal angle (ICA), form the main outflow pathway and a major target for glaucoma treatments. We characterized the human ICA in vivo with Optical Coherence Tomography (OCT) imaging using a customized goniolens and a commercial OCT device (Heidelberg Spectralis). METHODS/STUDY POPULATION: Imaging these structures is difficult due to the optical limitations of imaging through the cornea at high angles. Therefore, a clinical gonioscopy lens was modified with a 12mm plano-convex lens placed on its anterior surface to focus light on the ICA structures, and capture returning light. Each subjects' eye was anesthetized with 1 drop of Proparacaine 0.5%. The goniolens was coupled to the eye with gonio-gel and it was held by a 3D adjustable mount. OCT volume scans were acquired on 10 healthy subjects. The linear polarization of the OCT was rotated with a half-waveplate to measure dependence of the ICA landmarks on polarization orientation. RESULTS/ANTICIPATED RESULTS: The TM was seen in 9 of 10 subjects. Polarization rotation modified the brightness of the band of extracanalicular limbal lamina (BELL) and corneoscleral bands due to the birefringent nature of the collagenous structures, increasing the contrast of SC. SC width was 99 ± 20Âµm varying in size over space, including a subject with SC narrowing in the inferior-temporal quadrant. DISCUSSION/SIGNIFICANCE: This clinically suitable gonioscopic OCT approach has successfully been used to image the human ICA in 3D in vivo, providing detailed characterization of the TM and SC as well as enhancing their contrast against their birefringent backgrounds by rotating the polarization of the imaging beam.

448

Establishing the efficacy of naturally occurring endocannabinoid-like substance in an in vitro model of Fragile X Tremor/Ataxia Syndrome (FXT/AS)

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OBJECTIVES/GOALS: FXT/AS is a devastating, rare neurological syndrome that negatively impacts movement and cognition and is suspected to induce mitochondria dysfunction. Currently, no effective pharmacological treatments for FXTAS exist. The goal is to restore mitochondrial viability using endocannabinoid-like compounds in a cell culture model of FXTAS. METHODS/STUDY POPULATION: To establish a cell model of mitochondrial dysfunction, fibroblast baby hamster kidney (BHK-21) cell lines were treated with glucose oxidase (GluOx) at varying concentrations and times. Mitochondrial viability was assessed by the colorimetric Janus B Green Assay, which stains the mitochondria and enables assessment of cell numbers and the presence of oxygen in anchorage-dependent cell culture. Upon establishing this model of mitochondrial dysfunction, we next investigated the ability of three novel mitochondrial antioxidants (e.g., macamides) to protect mitochondrial viability. RESULTS/ANTICIPATED RESULTS: GluOx treatment of BHK-21 cells caused a dose- and time-dependent increase in oxidative stress. The data demonstrated significant disruption in the morphology of BHK-21 cells at a high glucose concentration, i.e., 40 nM, between 2 and 24 hours post-exposure. The morphology data were confirmed by the Janus B Green colorimetric assay. In examining the effects of glucose on mitochondrial viability, we demonstrated that at 15, 30, 35, and 40 nM, glucose significantly decreased mitochondria viability compared to the untreated, with 40 nM having the greatest effect. Under these conditions of mitochondrial dysfunction, co-incubation of the cells with the 0.5 uM MAM69 macamide attenuated the GluOx-induced increase in oxidative stress, with 0.5 uM MAM69 alone showing no effect on mitochondria viability. DISCUSSION/SIGNIFICANCE: This study illustrates the efficacy of macamides, natural occurring endocannabinoid like-compound, as novel prognostic and therapeutic candidates in the treatment of mitochondrial dysfunction that is associated with FXTAS. The use of BHK-21 fibroblast cells provides a rapid screening model to test for pharmacological therapeutic efficacy.

449

Progression of silica-induced pulmonary fibrosis is arrested after selective ablation of Col1a1+ fibroblasts

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OBJECTIVES/GOALS: Silicosis is a highly fatal progressive fibrotic disease of the lungs characterized by accumulation and persistence of fibroblasts that excessively deposit Collagen1a1. We sought to eliminate Collagen1a1-expressing fibroblasts through a targeted genetic ablation strategy and hypothesized that this would arrest the progression of Silicosis. METHODS/STUDY POPULATION: Silicosis was induced with a single intratracheal (i.t.) instillation of silica particles (RESULTS/ANTICIPATED RESULTS: Targeted ablation of Col1a1 + fibroblast in established Silicosis resulted in a decrease in: 1) Col1a1+ fibroblasts by flow cytometry and within fibrotic nodules by immunofluorescent staining, 2) total lung collagen content by histology and hydroxyproline assay, 3) tissue-associated disease by microCT and an increase in arterial oxygen saturation by pulse oximetry. Cessation of targeted Col1a1+ fibroblast ablation resulted in a rebound effect in Silicosis disease progression. Following ablation, Col1a1+ fibroblasts expanded by proliferation (Ki67+) and total lung collagen levels returned to pre-ablation levels. DISCUSSION/

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