organism C. elegans has a well-studied olfactory system, which provides an ideal platform to measure loss of smell with aging. The goal of our project is to use the short lifespan and olfactory changes observed in nematodes to identify mechanisms to slow aging and treat age-related diseases. Our approach is to utilize worms at various times of their healthy adult lifespan and to test for their sensitivity to known attractants such as benzaldehyde. These odorants are largely detected by the main AWC olfactory neurons. It is well documented that the responsiveness of AWC decreases with age. Our paradigm is to briefly fast worms to increase motivation before testing their ability to discriminate odors. Our results show that younger worms actively move toward the attractant and show preference for specific attractants. However, older worms frequently do not respond to attractive odors and remain near the point of origin, regardless of motility. These results indicate a decreased odor response with age. Our current work focuses on identifying genes and compounds that positively affect this odor response in older animals. The resulting data can then be tested for their efficacy to improve other aspects of healthspan and potentially longevity.

QUANTITATIVE EEG FEATURES OF LEVEL OF CONSCIOUSNESS IN CRITICALLY ILL NONAGENARIANS

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The standard for monitoring sedation levels in critically ill patients is intermittent bedside evaluation, and is prone to anchoring bias. Quantitative electroencephalography (qEEG) allows automated processing of recorded brain electrical activity and could be used to continuously monitor level of consciousness in critically ill patients. The majority of qEEG studies have included persons 80 years of age or less, and the qEEG profiles of nonagenarians have been incompletely characterized. Knowledge of the qEEG patterns of patients 90 years and older is essential for appropriate interpretation of such metrics in this population. This retrospective cohort study characterized qEEG profiles of acutely ill nonagenarians. We investigated whether the relationship between qEEG and level of consciousness differed between patients with and without a history of dementia. We included patients 90-100 years old admitted to Vanderbilt University Medical Center who underwent EEG and as part of their clinical care. We compared qEEG features to nursing-defined level of arousal as measured by the Richmond Agitation-Sedation Scale (RASS) in patients with and without history of dementia. Between January and December 2019, 26 nonagenarians underwent EEG for clinical purposes. One study was excluded due to excessive artifact. Of the remaining, 6 (24%) were male and 18 (72%) were Caucasian. Among all patients, RASS decreased with increases in EEG theta variability (coefficient -7.7, 95%CI -10.6 to -4.8). This relationship was not significantly modified by history of dementia (coefficient of interaction term -0.36, 95%CI -3.7 to 2.9). Dementia does not impact qEEG features of level of consciousness in nonagenarians.

SESSION 2876 (POSTER)

METABOLISM

4:10 CYCLES OF VERY LOW CALORIES PROTECT AGAINST TUMOR XENOGRAFTS, BUT NOT METASTASES IN THE ABSENCE OF CHEMOTHERAPY

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Cancer is a leading cause of mortality, with its incidence only expected to rise with an increasingly aging population. Dietary interventions, primarily caloric restriction (CR), lower cellular energy metabolism and have long been utilized to slow the aging process and protect against age-related diseases, including cancer. However, due to the stringency of CR, dietary alternatives that offer the same beneficial outcomes in cancer prevention and longevity have become increasingly attractive. Periodic cycles (4 days twice a month) of low caloric intake followed by a standard ad libitum (AL) diet was previously shown to promote health-span in mice and humans and protect against primary tumorigenesis and enhanced the effects of chemotherapy. The aim of our study was to compare the tumorigenic potential of 4T1 cells, a murine model of stage IV breast cancer, in young and aged female BALB/c mice fed either periodic cycles of low caloric diets versus chronic 20% CR. Compared to AL controls, we found a significant delay in primary tumor growth in mice regardless of diet composition by the 4:10 cycles of very low caloric intake. However, unlike in CR, CR-alternative diets were not protective against lung metastases in the absence of chemotherapy. Our study sheds light into the underlying differences of calorie-based interventions in the absence of chemotherapy.

A 3-WEEK TRYPTOPHAN-DEFICIENT DIET RESULTED IN DECREASED BODY WEIGHT AND INCREASED TRABECULAR BONE MASS IN MICE

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Tryptophan is an essential amino acid with a variety of bioactive metabolites including serotonin, melatonin and nicotinamide. Dietary Trp restriction results in increased lifespan but with detrimental side effects. The initial catabolite in the Trp breakdown pathway, kynurenine, increases with aging and induces bone loss. Thus, we hypothesized that eliminating Trp in the diet of older mice might be osteoprotective. In an IACUC-approved protocol, we fed either 0, 0.2 (standard), 0.7 or 1.25% Trp-containing diets to aged (23-month-old) C57BL/6 mice for a planned eight weeks. There was a rapid decrease in body weight in the mice fed the 0% tryptophan diet and the mice had to be sacrificed at three weeks (25.2±1.4 vs 35.4±3.6 vs 33.9±2.4 vs 33.4±3.1