

engage in a statewide Facebook (FB) group. **METHODS/STUDY POPULATION:** Cross-sectional online survey administered via iPads at the MN State Fair in 2018 to adults aged 18+ years residing in MN assessed demographics, social media use, interest in participating in a FB group for biomedical research; and open-ended questions on health topics of interest, and what would keep people engaged in this group. **RESULTS/ANTICIPATED RESULTS:** Respondents (N=487) were 21% racial minorities and 65% female sex. Most (87%, n=422) had created a personal FB profile. Of these, the proportion who agreed/strongly agreed was: 57% that the FB group sounded interesting, 45% were interested in being part of it, 41% were willing to share it with others, 62% that it would allow the community's thoughts/ideas to be heard and 59% wanted to learn about opportunities to participate in research on health topics they care about. Using content analysis, the top 3 health topics people wanted to learn about were chronic disease and prevention, wellness, and mental health. Top ways to keep people engaged were providing personable, relevant health information; and interactive bi-directional discussions. **DISCUSSION/SIGNIFICANCE OF IMPACT:** Findings will inform development of a FB group to engage diverse populations in biomedical research.

## Mechanistic Basic to Clinical

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### A Mouse Model to Study Image-Guided, Radiation-Induced Cardiac Injury and Potential Clinically Targetable Biologic Mediators

Alexandra Dreyfuss<sup>1</sup>, Ioannis Verginadis, Khayrullo Shoniyozov, Paco Bravo, Steven Feigenberg, Bonnie Ky and Constantinos Koumenis

<sup>1</sup>University of Pennsylvania School of Medicine

**OBJECTIVES/SPECIFIC AIMS:** The overall objective of this study is to develop a novel, clinically-relevant, image-guided mouse model for radiation-induced cardiotoxicity, which can be used to gain insight into clinically-targetable, pathophysiologic mechanisms of cardiac injury in thoracic radiotherapy patients. **METHODS/STUDY POPULATION:** Photon or sham radiation will be administered at differential doses to a defined portion of the heart and/or lungs of C57BL/6 female mice using micro-CT visualization of the heart with Xstrahl's MuriSlice Software applied to the Small Animal Radiation Research Platform (SARRP). Cardiac and lung segments from a subset of mice will be harvested at specific time points for confirmation of radiation targeting, local apoptosis assessment, and evaluation of fibrosis and vascular tissue morphology. Quantitative echocardiography, myocardial 18F-fluorodeoxyglucose positron emission tomography computed tomography (18F-FDG PET/CT), and myocardial perfusion imaging (MPI) with Technetium-99 (Tc-99) sestamibi will be implemented to identify sensitive imaging measures of cardiac injury and assess myocardial mechanics, inflammation, and perfusion deficits, respectively. Concurrently, a multiparametric analysis will be conducted to identify novel, circulating biomarkers of cardiotoxicity. **RESULTS/ANTICIPATED RESULTS:** We hypothesize that a clinically-relevant mouse model can be generated by the in situ, focal irradiation of a portion of heart and/or lung tissue segments, and can be used to elucidate molecular mechanisms of

radiation-induced cardiac damage. We anticipate time-dependent and dose-dependent, focal histopathologic changes in the mouse heart, with cardiac fibrosis development, vascular damage, and cellular apoptosis in irradiated mice. Additionally, we anticipate that our mouse model of focal heart irradiation will reveal radiologic and biochemical changes that can be used to characterize and predict radiation-induced cardiac injury. Specifically, we expect our quantitative echocardiography, FDG-PET, and MPI parameters to identify and characterize cardiac damage that topographically matches histopathological analysis, and expect levels of select biochemical markers to differentially vary with time. **DISCUSSION/SIGNIFICANCE OF IMPACT:** Our mouse model of radiation-induced cardiotoxicity has the potential to shift current preclinical research paradigms to more closely mimic the radiation plans most commonly administered in clinical practice. The primary technologic innovation to be developed here is the use of the SARRP to deliver image-guided, in situ, focal radiation to a defined portion of the mouse heart. From a conceptual perspective, we propose a novel approach for phenotyping radiation-induced cardiac damage in patients undergoing chest radiation therapy, integrating sensitive radiomic and biochemical markers into a predictive model of cardiotoxicity.

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### A TL1 Team Approach to Personalizing Donor Human Milk for the Preterm Infant

Marion M Bendixen<sup>1</sup>, Natalie Harrison, Graciela Lorca, PhD and Leslie Parker, PhD, APRN, FAAN

<sup>1</sup>University Of Florida Clinical and Translational Science Institute

**OBJECTIVES/SPECIFIC AIMS:** Aim 1: To compare frozen MOM to fresh MOM over time as an agent to inoculate DHM and measure the enrichment of commensal microbes and their beneficial bioactive components similar to MOM. Hypothesis: Frozen or fresh MOM inoculated in DHM will produce similar microbial content to MOM over time allowing for the production of beneficial bacterial compounds that may contribute to host immune response. Aim 2: To determine the effect of MOM storage (fresh vs frozen) on the expansion of bioactive components from live microbiota in DHM. Hypothesis: Both fresh and frozen MOM will produce similar results when inoculated into DHM to restore the microbial content (including their bioactive components) similar to each MOM sample. Aim 3: To compare the microbiome found in a mother's MOM to the microbiome in her infant's stool. Hypothesis: The mother/infant pair will share a common microbiome between the mother's MOM and her infant's stool. **METHODS/STUDY POPULATION:** Subjects will include 12 pump-dependent mothers of infants born < 34 weeks gestation admitted to the University of Florida Health Shands Hospital, Neonatal Intensive Care Unit (NICU). Inclusion criteria consists of mothers expressing over 100 ml of MOM per day, producing at least 45 ml of MOM at an expression session, at least 18 years of age, and speak English. Mothers are excluded if they have taken antibiotics within 3 days of sample collection, are HIV+, or delivered an infant who has a chromosomal abnormality or is severely ill. An expressed MOM sample will be collected and divided into two fractions: (A) fresh and (B) frozen at -20C for 24 h. The fresh fraction (A) will be processed immediately while the frozen fraction (B) will be processed after 24 h. Each MOM will be inoculated in DHM at dilutions of 10% and 30% and incubated at different time points: 0 h (T0), 2 h