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Team Science Competencies for Clinical Research Professionals: Determining Skills and Leveling Through a Modified Delphi Approach

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OBJECTIVES/GOALS: Team science competencies are not well-defined for nonfaculty staff of Clinical Research Professionals (CRPs) who conduct research. Using an existing framework, our work has determined skills associated with team science competencies as related to CRPs. Our team also outlined examples of those skills on a fundamental, skilled, and advanced level. METHODS/STUDY POPULATION: The team consists of both CRPs and those working in the Team Science space. This team used a modified Delphi approach to determine the skills and leveling examples of each team science competency. The team broke into four groups and was assigned 3-4 competencies each. Each group determined skills needed to support (exhibit, promote) each competency and then described an example of this skill at the fundamental, skilled, and advanced levels. Once each group was finished with their assigned competencies, they were re-assigned to a different group for review and changes. Finally, team science and CRP experts reviewed the skills and levels. RESULTS/ANTICIPATED RESULTS: Our results are a rubric that defines 3-5 practical skills per described competency. These skills are needed to support and promote each competency as a CRP. An additional outcome from this work includes examples of each skill at the fundamental, skilled, and advanced levels in a CRP's career. Each leveled example is described in a concise, actionable way using Bloom's taxonomy. This rubric is meant to be easily understood, very useable and able to be used in conjunction with existing CRP competency frameworks. By using Bloom's taxonomy, we set the stage for future educational programming in Team Science skill-building for clinical research professionals. DISCUSSION/SIGNIFICANCE: Team science concepts and competencies have been increasingly integrated into translational science teams. However, team science competencies related to CRPs have remained largely undefined. Our work helps to define these competencies for CRPs in a practical way. Our rubric fills gaps in, and builds on, existing CRP competency frameworks.

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The effects of dietary fiber based on fermentability and viscosity on phosphorus absorption and the gut microbiome in chronic kidney disease-mineral and bone disorder

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OBJECTIVES/GOALS: To compare the effects of dietary fiber supplementation based on fermentability and viscosity on phosphorus fractional absorption and the gut microbiome in a rat model of chronic kidney disease-mineral and bone disorder (CKD-MBD). METHODS/STUDY POPULATION: 25-week-old Cy/+ male rats (CKD hereafter) will be randomly assigned to receive one of four fiber treatments (10% w/w each) based on fermentability and viscosity: 1) Cellulose (-fermentability, -viscosity), 2) inulin (+fermentability, -viscosity), 3) psyllium husk (-fermentability, +viscosity), or 4) pectin (+fermentability, +viscosity). Diets will be formulated with a semipurified diet containing 0.7% phosphorus. Treatments will last for 10 weeks, and rats will be euthanized at 35 weeks of age, where animals have reached kidney failure. Intravenous and oral 33P will be used for intestinal phosphorus fractional absorption and cecal/fecal samples will be obtained at euthanasia for microbiome assessment using shotgun metagenomics. RESULTS/ANTICIPATED RESULTS: Our preliminary data show that fermentable dietary fiber (inulin) impacted phosphorus homeostasis by increasing the circulating levels of fibroblast growth factor-23 (a bone-derived hormone that increases phosphorus excretion in urine) and lowering circulating levels of phosphorus in the Cy/+ male rat model of progressive chronic kidney disease. We hypothesize that dietary fiber impacts phosphorus absorption in gut microbiome-dependent and independent mechanisms. For example, fermentable fiber enhances the production of short-chain fatty acids, lowering the intraluminal pH, and enhancing mineral solubility and absorption. Meanwhile, viscous fibers may encapsulate minerals limiting their absorption if these fibers are non-fermentable. DISCUSSION/SIGNIFICANCE: Hyperphosphatemia, or high circulating phosphorus, is a major factor in the pathogenesis of CKD-MBD. Treatment of hyperphosphatemia is focused on reducing intestinal absorption. However, available therapies vary in their efficacy and focus on phosphorus absorption in the small intestine, ignoring the possible impact of the large intestine.

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To Stay or Not to Stay: Multidisciplinary Collaboration After NSF Funding

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OBJECTIVES/GOALS: NSF often requires cross-disciplinary team composition to be competitive for funding. To what extent do research teams have multidisciplinary authorships after they win an award, given that awards are not contracts? We examined the quantity and quality of multidisciplinary collaboration of NSF-funded teams before and after receiving their award. METHODS/STUDY POPULATION: Our sample was 150 PIs and Co-PIs (67% male) from 58 NSF-funded EAGER (EArly-concept Grants for Exploratory Research) grants between 2013 and 2019. Using publicly available information, we collected the number of conference papers, publications, and grants PIs/co-PIs produced with each other (all PIs and co-PIs in a team or a partial subset). Based on Ph.D. fields, we also cataloged whether the combination of PIs/co-PI authors on outputs represented unidisciplinary or multidisciplinary collaboration after their NSF award. Multidisciplinary collaboration consisted of multidivisional (Ph.D. disciplines across NSF divisions, e.g., political science and cognitive psychology) or multidirectorate (Ph.D. disciplines across NSF directorates, e.g., psychology and engineering) authorship. RESULTS/ANTICIPATED RESULTS: Of the 74% of PI and co-PI teams who collaborated after their EAGER award, almost 9 out of 10 chose to work with a collaborator from a different discipline, and almost 8 out of 10 chose to work with a researcher from an extremely diverse discipline from their own (e.g., computer science and psychology). Research on interdisciplinary teams largely emphasizes the challenges and problems they face