

analyze trends over time and further compare disciplinary differences. RESULTS/ANTICIPATED RESULTS: UC is a diverse institution that includes world-renowned creative schools (the College Conservatory of Music and the College of Design, Architecture, Art, and Planning), as well as traditional colleges of medicine, nursing, pharmacy, allied health, engineering, business, arts and sciences, etc. UC also includes two branch campuses that specialize in associate's degree level education. Given the diversity in educational and research missions across these areas, we anticipate discovering several themes within the RPT guidelines, primarily centered around the traditional foundations of faculty work such as service, research, and teaching. We anticipate strong differences by college and disciplinary focus, with emphasis on collaborative work and engagement increasing as RPT guidelines become more current. DISCUSSION/SIGNIFICANCE OF IMPACT: Our experience is that faculty members want to engage in collaborative work when possible and appropriate, but their perception is that independent contributions to their field are more highly valued than interdisciplinary work. As universities rush to endorse and promote interdisciplinary, team-oriented research and teaching, this study will afford a better understanding of the types of activities valued at one large and diverse urban institution, grounded in the actual language of RPT criteria.

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### Development of a Leadership Assessment Scale in Translational Science

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OBJECTIVES/SPECIFIC AIMS: To create the instrument, we employed a modified Delphi approach by conducting a thorough literature review on Leadership to help concretize the relevant constructs, and then used these extracted constructs as a springboard for the Rockefeller Team Science Educators (TSE's) to discuss and refine the leadership domain areas, collectively creating domain-specific survey items, and then further discussed and refining the number, grouping, and wording of the items. METHODS/STUDY POPULATION: We piloted the Leadership Survey by having all of the Rockefeller TSEs rate Clinical Scholars. Each item was answered using a six-point Likert scale where a low score indicated poor expression of the specific leadership attribute and a high score represented excellent expression of the specific leadership attribute. RESULTS/ANTICIPATED RESULTS: Means, medians, standard deviations, and ranges of each item were calculated and tabulated. A complete (Pearson) correlation matrix was computed so that the raw inter-item relationships can be observed. For each a priori Domain an equal weighted summary scale was created and tabulated for review. The internal consistency of each a priori scale was assessed by calculating Cronbach's Alpha ( $\alpha$ ). Items with low Item to Construct coefficients were candidates for elimination or modification, and overall scales with low's will undergo further discussion. To challenge our assumptions of the construction and integrity of each domain, we employed exploratory Principal Components Analysis (PCA), followed by orthogonally rotated Factor Analysis (FA). We also forced the PCA / FA analysis to extract the a priori dimensions that allowed us to compare if the empirical and a priori structures match. DISCUSSION/SIGNIFICANCE OF IMPACT: We are partnering with the CTSA programs at Penn and Yale to assess issues of generalizability and scalability. We are working with Vanderbilt to install survey onto REDCap for ease of dissemination.

Will continue to assess psychometric properties and refine as we receive more input.

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### Diseased and Healthy Gastrointestinal Tissue Data Mining requires an Engaged Transdisciplinary team

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OBJECTIVES/SPECIFIC AIMS: To establish an effective team of researchers working towards developing and validating prognostic models employing use of image analyses and other numerical metadata to better understand pediatric undernutrition, and to learn how different approaches can be brought together collaboratively and efficiently. METHODS/STUDY POPULATION: Over the past 18 months we have established a transdisciplinary team spanning three countries and the Schools of Medicine, Engineering, Data Science and Global Health. We first identified two team leaders specifically a pediatric physician scientist (SS) and a data scientist/engineer (DB). The leaders worked together to recruit team members, with the understanding that different ideas are encouraged and will be used collaboratively to tackle the problem of pediatric undernutrition. The final data analytic and interpretative core team consisted of four data science students, two PhD students, an undergraduate biology major, a recent medical graduate, and a PhD research scientist. Additional collaborative members included faculty from Biomedical Engineering, the School of Medicine (Pediatrics and Pathology) along with international Global Health faculty from Pakistan and Zambia. We learned early on that it was important to understand what each of the member's motivation for contributing to the project was along with aligning that motivation with the overall goals of the team. This made us help prioritize team member tasks and streamline ideas. We also incorporated a mechanism of weekly (monthly/bimonthly for global partners) meetings with informal oral presentations which consisted of each member's current progress, thoughts and concerns, and next experimental goals. This method enabled team leaders to have a 3600 mechanism of feedback. Overall, we assessed the effectiveness of our team by two mechanisms: 1) ongoing team member feedback, including team leaders, and 2) progress of the research project. RESULTS/ANTICIPATED RESULTS: Our feedback has shown that on initial development of the team there was hesitance in communication due to the background diversity of our various member along with different cultural/social expectations. We used ice-breaking methods such as dedicated time for brief introductions, career directions, and life goals for each team member. We subsequently found that with the exception of one, all other team members noted our working environment professional and conducive to productivity. We also learnt from our method of ongoing constant feedback that at times, due to the complexity of different disciplines, some information was lost due to the difference in educational backgrounds. We have now employed new methods to relay information more effectively, with the use of not just sharing literature but also by explaining the content. The progress of our research project has varied over the past 4-6 months. There was a steep learning curve for almost every member, for example all the data science students had never studied anything related to medicine during their education, including minimal if none exposure to the ethics of medical research. Conversely, team members with medical/biology

backgrounds had minimal prior exposure to computational modeling, computer engineering and the verbage of communicating mathematical algorithms. While this may have slowed our progress we learned that by asking questions and engaging every member it was easier to delegate tasks effectively. Once our team reached an overall understanding of each member's goals there was a steady progress in the project, with new results and new methods of analysis being tested every week. **DISCUSSION/SIGNIFICANCE OF IMPACT:** We expect that our on-going collaboration will result in the development of new and novel modalities to understand and diagnose pediatric undernutrition, and can be used as a model to tackle several other problems. As with many team science projects, credit and authorship are challenges that we are outlining creative strategies for as suggested by International Committee of Medical Journal Editors (ICMJE) and other literature.

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### Evaluation of a Team Leadership Assessment Center Study for Scientists

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**OBJECTIVES/SPECIFIC AIMS:** The objective for the present study is to evaluate qualitatively the Team Leadership Assessment Center (LAC) at UTMB-Galveston. There has been much discussion about the need for leader development within team science (Börner, et al, 2010; Falk-Krzensinski, et al., 2011). The LAC was designed to examine the study participants' beliefs and perceptions of and competencies in team leadership by means of a multi-trait multi-method approach. Our team competency model involves seven dimensions and twenty-five specific competencies. There were two complementary components to the evaluation: a quantitative survey and a series of qualitative interviews, to be discussed here. **METHODS/STUDY POPULATION:** The study population for the qualitative component consisted of seventeen volunteers from the pool of fifty-one LAC participants, including trainees (KL2 scholars, TL1 scholars) as well as assistant professors, and early career associate professors. Each volunteer respondent was engaged in a twenty to thirty-minute, recorded, conversational, telephone interview. They were asked to describe and evaluate their LAC experience in their own words, perceptions, and values. The study was reviewed by the Committee for the Protection of Human Subjects at UTMB. **RESULTS/ANTICIPATED RESULTS:** Major findings from respondents' overall assessment of their Center experience include: All respondents stated that the LAC was a worthwhile experience. All respondents stated they would be willing to participate in any follow-up LAC activity. Before the LAC experience, most respondents indicated that they perceived leadership as a condition or feature of a job, appointment, or profession and not an individualistic feature of personality or experience. Ideational or conceptual definitions of leadership were superseded by administrative or managerial tropes. Major categorical indexes were related to occupational status. The generally held belief is one is not trained to be a leader, but to perform leadership tasks. Significant differences among respondents tended to cluster around occupational positions and statuses at UTMB, for example: Surgeons feel they are team oriented and their work is organized according to necessary tasks. Assistant professors and post-docs generally perceive the design of leadership as defined by the demands of their specialized field, not determined institutionally or professionally. A general take-away was the sense that, although some participants did not consider themselves to be "leaders" before the training,

most felt that the "pressure" to be or become a leader was relieved a bit by the LAC. One was only expected to develop leadership skills and strategies, not change one's Self-Identity. **DISCUSSION/SIGNIFICANCE OF IMPACT:** The more complex the job status, the less critical is the need to achieve the Self-Identity of "leader." Complaints about the LAC were very few and non-modal in occurrence. A general recommendation would be for the facilitators of programs like LAC to take cultural differences more into consideration. The most highly rated feature of the LAC is the personal attention given to participants during the one-on-one evaluation profile.

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### Longitudinal analysis of research collaborations and emerging networks

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**OBJECTIVES/SPECIFIC AIMS:** To longitudinally track emerging research collaborations and assess their development and productivity. **METHODS/STUDY POPULATION:** In four administrations (2011, 2013, 2015, 2017), all full- and part-time University of Rochester Medical Center faculty received an email invitation to complete a research collaborators survey. Respondents indicated whether they were involved in research, and if involved in research, identified collaborators from a drop-down list of investigators in the institution. Space was provided for write-ins. Full- and part-time status, faculty rank, and departmental affiliation was associated with each investigator. Grant data were obtained from a grant management database maintained by the institution's Office of Research and Project Administration. Grant data included all submissions (funded and not funded), award number, award effective date, award final expiration date, funding amounts, principal investigator and co-investigators. Using Mathematica SNA software, for each year we identified collaborator dyads (including their characteristics such as inter/intradepartmental; investigator characteristics) and networks (e.g. size, density). **RESULTS/ANTICIPATED RESULTS:** On average, 1800 (range 1730-2034) full- and part-time faculty received email invitations to complete the survey. An average of 403 respondents (range 385-441) completed the survey each administration. While the response rate seems low, the survey was distributed to every faculty member regardless of their primary appointment. Thus it included a large number of individuals whose role is exclusively clinical. Grant data included 4429 awards received between 2011 and 2018, involving 1395 investigators as principal or co-investigators. Survey respondents naming collaborators ranged from 233 to 280 (average 257) with 1594 to 2265 (average 1988) collaborations named each year. Overall density increased from .0204 in 2011 to .0342 in 2017. Density within the group of female investigators increased from .0219 in 2011 to .0412 in 2017. Within the group of male investigators, density increase from .0226 to .0333 in the same time span. Analysis by rank, changes over time and those with grant funding is underway. **DISCUSSION/SIGNIFICANCE OF IMPACT:** This methodology captured a consistent number of collaborations over an 8 year period. Analyses reveal network growth over time and of increasing heterogeneity (by gender). Analyzing research networks overtime provides an important metric to assess how research networks evolve and devolve and the characteristics of those that grow or stagnate. Further these analyses can demonstrate the impact