577

EQUATOR network implementation science reporting and adherence challenges for learning health systems

Christopher Carpenter[1], Kayla P[2], Nanci C. Hawley[1], Young J. Juhn[3], Jennifer L. Ridgeway[4], Matthew J. Spiten[5], Jenny A. Weiss[1] and Hilal Maradit Kremers[6]

[1]Mayo Clinic Health Care System; [2]Department of Emergency Medicine Mayo Clinic Rochester; [3]Research Chair, Mayo Clinic Health Care System; [4]Kern Center, Mayo Clinic Health System; [5]Research Assistant, Mayo Clinic Health Care System and [6]Co-Chair Learning Health System, Mayo Clinic Health System

OBJECTIVES/GOALS: The Standards for Reporting Implementation Studies (StaRI) are the Enhancing the Quality and Transparency of Health Research (EQUATOR) Network 27-item checklist for Implementation Science. This study quantifies StaRI adherence among self-defined Implementation Science studies in published Learning Health Systems (LHS) research. METHODS/STUDY POPULATION: A medical librarian-designed a search strategy identified original Implementation Science research published in one of the top 20 Implementation Science journals between 2017 and 2021. Inclusion criteria included studies or protocols describing the implementation of any intervention in healthcare settings. Exclusion criteria included concept papers, non-implementation research, or editorials. Full-text documents were reviewed by two investigators to abstract and judge StaRI implementation and intervention adherence, partial adherence, or non-adherence. RESULTS/ANTICIPATED RESULTS: A total of 330 documents were screened, 97 met inclusion criteria, and 47 were abstracted including 30 research studies and 17 protocols. Adherence to individual StaRI reporting items ranged from 13% to 100%. Most StaRI items were reported in >60% of manuscripts and protocols. The lowest adherence in research studies was noted around economic evaluation reporting for implementation (16%) or intervention (13%) strategies, harms (13%), contextual changes (30%), or fidelity of either the intervention (34%) or implementation (53%) approach. Subgroup analyses were infrequently contemplated or reported (43%). In protocols, the implications of the implementation strategy (41%) or intervention approach (47%) were not commonly reported. DISCUSSION/SIGNIFICANCE OF IMPACT: When leveraging implementation science to report reproducible and sustainable practice change initiatives, LHS researchers will need to include assessments of economics, harms, context, and fidelity in order to attain higher levels of adherence to EQUATOR's StaRI checklist.

578

A guide to successful management of data science collaborative partnerships in academic health centers

Alyssa Platt[1,2], Gina-Maria Pomann[2], Lacey Rende[2], Tracy Truong[2], Mary Boulos[3], Nichole E. Carlson[4], Manisha Desai[3], Monica Elam[2], Emily Slade[5], Alexandra Hanlon[6], Jillian Hurst[7], Olsen[2] and Laila Poisson[8]

[1]Duke University; [2]Duke University School of Medicine; [3]Stanford University School of Medicine; [4]Colorado School of Public Health; [5]University of Kentucky; [6]Virginia Tech; [7]Duke University School of Medicine Maren and [8]University Health Sciences

OBJECTIVES/GOALS: To design a flexible, comprehensive framework for Data Science Units to cultivate sustainable, long-term relationships with Clinical and Translational Science Research Units. Best practices for managing Data Science collaborations are presented to improve the quality and efficiency of research conducted throughout academic health centers. METHODS/STUDY POPULATION: Leaders of Data Science Units across six institutions formed a workgroup to develop guidance and best practices for Data Science Units to establish long-term, sustainable collaborations with Clinical and Translational Science Research Units. This guidance is based on tools and protocols developed and employed by the participating units, which range from larger groups with over 20 partnerships to a unit with three partnerships that is actively working to expand. Importantly, partnerships are highly variable, with some partnerships at one institution representing engagement with over 500 faculty, whereas some partnerships at another institution involve the lab of a single investigator. RESULTS/ANTICIPATED RESULTS: We offer guidance in three domains: (1) Identifying the needs for a new partnership, including assessing required effort and data science expertise, setting partnership priorities, developing formal agreements, and identifying goals and metrics; (2) managing data science teams by implementing regular meetings, creating project intake and prioritization processes, and effort monitoring; and (3) evaluating the successes and failures/gaps of the collaboration by measuring the metrics mapped to the goals. For each domain, we provide specific suggestions on which parties should be involved and how frequently the processes should occur. This guidance is applicable both to larger collaborative partnerships and to smaller, single faculty or staff partnerships, whether they are new or well-established. DISCUSSION/SIGNIFICANCE OF IMPACT: Effective collaboration between data scientists and clinical and translational investigators is key to advancing data-driven research. The guidance and resources are presented to support Data Science Units in successfully managing long-term collaborations through goal-development, evaluation, and adapting to evolving research needs.

580

A CTS team approach for SHINE-VH barrier technology: Design and application of a novel vaginal mucosal barrier against bacterial vaginosis

Amanda Ojeda, Ariana Tamura, Luiz Fernando Wurdig Roesch and Brent Sumerlin

University of Florida

OBJECTIVES/GOALS: Develop a cervicovaginal mucus replacement to prevent bacterial vaginosis (BV) in pregnant women. Our therapeutic, specialized hydrogel in natural enhancement for vaginal health (SHINE-VH), is formulated through polymer chemistry, tested for efficacy and safety through microbiology, and translated through clinical and translational science. METHODS/STUDY POPULATION: We will develop SHINE-VH with optimized viscoelastic and mucoadhesive properties intended to mimic healthy vaginal mucus. SHINE-VH will be synthesized via robust photoiniferter methods and investigated through shear rheology, sugar binding, and permeability studies. To evaluate the biocompatibility and safety profile of SHINE-VH, we will utilize a series of in vitro models to test its impact on the viability and cytotoxicity of human vaginal epithelial cells. In addition, we will assess the capacity of SHINE-VH to fortify vaginal barrier integrity and modulate anti-inflammatory activities in a 2D epithelial barrier model exposed to BV-associated pathogens. Lastly, employing organ-on-a-chip technology, vaginal swabs from both healthy and suspected BV pregnant patients will be treated with SHINE-VH. RESULTS/ANTICIPATED RESULTS: SHINE-VH will mimic the protective, hydrophilic gel network of natural mucins. The viscoelastic properties of our formulation

https://doi.org/10.1017/cts.2024.1149 Published online by Cambridge University Press

determined by shear rheology will be tuned through concentration and polymer composition to mimic vaginal mucus. We will also show the facile movement of small molecule nutrients through the SHINE-VH network via sugar-binding and permeability tests. Additionally, we anticipate that the introduction of SHINE-VH, due to their xenobiotic nature as synthetic mucins, will modulate the microbiota by diminishing inflammation, thereby reinforcing the cervicovaginal mucus and cultivating a vaginal microbiome that is more resilient to the disruptive impacts of BV. Such modulation could lead to a marked difference between the SHINE-VH-treated and untreated groups. DISCUSSION/SIGNIFICANCE OF IMPACT: BV affects ~30% of women globally and is associated with severe gynecologic and obstetric complications, representing a significant unmet need in women's health. SHINE-VH offers a novel approach to BV management, aiming to strengthen vaginal mucosal integrity, potentially reducing BV prevalence, and improving women's health outcomes.

582

A comparative approach to understanding the role of oncogenic MYC signaling in the metastatic osteosarcoma tumor immune microenvironment

Rebecca Makii[1], Téa Ned[2], M Jane Underdown[3], Eric Palmer[2], Breelyn A Wilky[3] and Daniel P Regan[2]
[1]Colorado State University; [2]Department of Microbiology, Immunology, & Pathology, Colorado State University and [3]University of Colorado Cancer Center, Aurora

OBJECTIVES/GOALS: Osteosarcoma (OS) is the most common primary bone malignancy in humans and dogs. >40% of children and >90% of dogs succumb to metastatic disease. We hypothesize MYC overexpression in metastatic canine and human OS contributes to an immunosuppressive tumor environment by driving tumor-associated macrophage influx and T lymphocyte exclusion. METHODS/STUDY POPULATION: To characterize the role of oncogenic MYC signaling in the canine metastatic tumor immune microenvironment (TIME), 42 archived FFPE lung metastatic canine OS samples were evaluated for MYC copy number variation (CNV), mRNA, and protein expression via ddPCR, nanostring analysis, and immunohistochemistry (IHC). Seven samples also underwent GeoMX spatial profiling to more specifically evaluate T cell and macrophage transcriptional profiles based on MYC status. To determine the role of MYC target modulation as a potential therapeutic option, canine and human OS cell lines were treated with a novel MYC inhibitor (MYCi975) and assessed for effects on survival, proliferation, and cytokine profiles. RESULTS/ANTICIPATED RESULTS: We demonstrate that copy number gains are not a key driver of MYC hyperactivity in canine metastatic OS. However, stratification based on MYC protein expression demonstrates that "MYC-high" tumors are associated with downregulation of cytotoxic effector T-cell associated transcripts and upregulation of tumor-associated macrophage (TAM) and extracellular matrix remodeling transcripts. We also report that MYCi975 treatment of canine and human OS cell lines results in significant inhibition of OS cell survival and proliferation at concentrations that are pharmacologically achievable in mice. Furthermore, we demonstrate MYC inhibition by MYCi975 is associated with reduced pro-inflammatory cytokine secretion in OS cell culture models. DISCUSSION/SIGNIFICANCE OF IMPACT: While MYC overactivity in metastatic canine OS may not be genomically driven, other mechanisms that lead to increased MYC protein expression are associated with transcriptomic profiles supportive of local immunosuppression. Pharmacologic targeting of MYC may serve as a strategy to bolster immunotherapeutic options in metastatic OS treatment.

583

Using social network analysis to power translational research collaborations

Carlamarie Noboa[1], Mariela Lugo Picó[1], Vicmag Cabrera[2], Luisa Morales[3] and Valerie Wojna[1]
[1]Medical Sciences Campus-University of Puerto Rico; [2]Universidad Central del Caribe and [3]Ponce Health Science University

OBJECTIVES/GOALS: Delving into the intricate web of translational research collaborations, this study analyzed the evolving landscape of the Hispanic Alliance of Clinical and Translational Research from 2020 to 2024 using cutting-edge social network analysis (SNA). SNA is a powerful tool for visualizing, understanding, and harnessing the power of networks. METHODS/STUDY POPULATION: We conducted a systematic document review of all the Alliance IDeA-CTR Network Calls for Pilot Projects from 2020 to 2024 including key attributes of the investigators and collaborators (e.g., academic institution, highest degree, collaborator type). Scientific collaboration was defined as two or more researchers working together in a grant proposal for a pilot project application. Study data was recorded and tracked using an Excel spreadsheet. R-Statistical software was used to analyze and map the networks resulting from collaboration interactions comparing the 2020 Call and 2024 Call. Network statistics were performed including nodes, isolates, edges, components, density, diameter, average degree, and the size of the main component. RESULTS/ANTICIPATED RESULTS: Within a vibrant network comprising over 150 investigators from local and national academic institutions, clinicians (49.3%), and basic researchers (25.4%) are predominant. Initial findings showcase a remarkable surge in interdisciplinary collaborations and affiliations over time. Preliminary findings demonstrated that the number of nodes/actors increased from 16 to 75 comparing 2020 to 2024 and the edges/relationships from 12 to 66. Notably, the number of translational research clusters surged from 4 to 18, with mentorship emerging as a critical conduit bridging diverse research clusters; 16 to 78 nodes in comparison from 2020 to 2024. More extensive collaborative clusters occurred across time with over 20 researchers collaborating. A mentor was the main actor connecting these research clusters. DISCUSSION/SIGNIFICANCE OF IMPACT: This study unveils the intricacies and power of translational research dynamics, showing a palpable surge in collaboration diversity and depth. By harnessing data-driven insights, our approach catalyzes informed decision-making to amplify collaboration, diversity, and network efficacy, offering invaluable guidance for policy and practice.

584

ICTR data science initiative: Empowering translational teams to better leverage data science

Whitney Sweeney and Allan R. Braiser
Madison, University of Wisconsin

OBJECTIVES/GOALS: High-performing translational teams (TTs) effectively draw knowledge from empirical data to develop health solutions. However, some TTs lack rigorous data approaches, resulting in inefficiency. The ICTR data science initiative integrates

https://doi.org/10.1017/cts.2024.1149 Published online by Cambridge University Press