is to expand our group, support the formation of similar communities, and promote data science and AI literacy in biomedical and clinical contexts. We aspire to extend this knowledge to families, classmates, and eventually patients, facilitating a broader understanding of the role of AI in healthcare. DISCUSSION/SIGNIFICANCE: We believe diverse expertise and pedagogical theories can help demonstrate the potential of citizen science to democratize scientific experience. By nurturing collaborative networks our efforts aim to bridge gaps between disciplines and enhance the broader public's understanding of AI in healthcare.

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The link between preexisting hypertension and COVID-19 severity in a hamster model

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OBJECTIVES/GOALS: Hypertension is a major risk factor for coronavirus disease 2019 (COVID-19) severity. Our goal was to determine if hypertension worsens lung pathology induced by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection in hamsters. METHODS/STUDY POPULATION: Male hamsters (7-8 weeks old) were infused with angiotensin II (AII; 200 ng/kg/min via osmotic minipump) for 4 weeks to induce hypertension. During the last week of the infusion, the hamsters were inoculated intranasally with vehicle (V) or SARS-CoV-2 (S; 1 x 105 plaque forming units/ml). Half of the hamsters were sacrificed 1 day post-inoculation (dpi-1) and the other half on dpi-6. Two scoring systems were applied to lung tissue sections stained with hematoxylin and eosin to determine the degree and severity of lung pathology: the first system assessed all pertinent alterations in the lungs, while the second system only assessed the pathology related to the pulmonary vasculature. Lung histopathology scores were calculated as the sum of the airway and lung alveolar scores in arbitrary units (AU). RESULTS/ANTICIPATED RESULTS: Studies revealed that the SARS-CoV-2-infected hamsters exhibited a 76-fold higher total airway score compared to vehicle controls [(AU): V, 0.25 ± 0.1; S, 19.00 ±1.35; $p<0.05$; n=4]. Total lung alveolar scores (27-fold) [(AU): V, 0.30 ± 0.11; S, 8.0 ± 4.1; $p<0.05$; n=4] and total vascular scores (17-fold) [(AU): V, 0.35 ± 0.2; S, 6.0 ±1.4; $p<0.05$; n=4] were also markedly higher compared to controls on dpi-1. AII increased blood pressure, which was sustained through the 4-week infusion period. Under these conditions, body weight slightly dropped by 4.5%. Ongoing studies are assessing the effect of hypertension on the % of airway, alveoli and vessels affected, airway and alveolar severity, and bronchiolar epithelial and type II pneumocyte hyperplasia. DISCUSSION/SIGNIFICANCE: Establishing the hypertensive hamster as a small animal model of COVID-19 will facilitate investigations into why preexisting hypertension is a risk factor for disease severity. These studies could lead to the development of novel therapeuticsfor treating COVID-19 patients with hypertension.

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Interleukin-6 protects renal dysfunction in mouse models of hypertension and salt-sensitive hypertension

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OBJECTIVES/GOALS: We are investigating the role of IL-6 in regulating renal function by measuring mean arterial pressure (MAP), renal plasma flow (RPF) and glomerular filtration rate (GFR) in wild type (WT) and IL-6-knockout (KO) mice in established mouse models of angiotensin II (AII)-dependent- hypertension and -salt-sensitive hypertension. METHODS/STUDY POPULATION: Twelve-week-old male WT and KO mice on the C57BL6 background strain were infused with vehicle (V; saline) or angiotensin II (AII; 200 ng/kg/min) for 12-14 days. Half of the AII-treatment groups were maintained on a high salt (HS; 6% NaCl) diet for the duration of the experiment, while the other half of the AII treatment groups and both vehicle groups were fed normal rat chow. MAP was continuously measured by a fluid filled catheter in conscious mice for the duration of the experiment. RPF and GFR were measured on days 12-14 in anesthetized mice by the para-aminohippurate, and fluorescein isothiocynate-Inulin techniques, respectively. All data were analyzed by 2-way ANOVA; $*p<0.05$ vs. WT, same treatment; $\#p<0.05$ vs.V, same genotype; $^p<0.05$, AII vs. AII+HS, same genotype. RESULTS/ANTICIPATED RESULTS: MAP was 31% lower in KO vs WT mice. AII increased MAP (1.2-fold) in WT but not KO mice. HS diet magnified AII-induced increases in MAP in WT and moderately increased MAP in AII-KO mice: [MAP (mmHg): WT+V, 130±7.0; KO+V, 91.0+4.0*; WT+AII, 153±5.0#; KO+AII, 83.0±4.0*; WT+AII+HS, 150±11#; KO+AII+HS, 93.0±4.0#]. AII infusion reduced RPF in the KO but not WT mice. Addition of HS reduced RPF in WT and exacerbated AII-induced reductions in RPF in KO mice [RPF (ml/min/g): WT+V, 1.82±0.23; KO+V, 1.91+0.40; WT+AII, 3.16±0.75#; KO+AII, 1.65±0.42*; WT+AII+HS, 1.10±0.31#^; KO+AII+HS, 1.13±0.XX#^]. The HS diet reduced GFR in AII-infused KO but not WT mice [GFR (μl/min/g): WT+V, 756±XX; KO+V, 788±XX; WT+AII, 1010 ±63*#; KO+AII, 756±23*; WT+AII+HS, 1100±150#; KO+AII +HS: 540±210*#^]. DISCUSSION/SIGNIFICANCE: The absence of IL-6 in male mice attenuated AII- and/or AII+HS-induced increases in MAP; however, it exacerbated HS-induced reductions in RPF and GFR. These findings suggest inhibiting IL-6 has therapeutic potential as an antihypertensive but not as a renal protective agent in hypertension and salt-sensitive hypertension disease states.

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Factors that impact the success of community-engaged research: perspectives from experienced researchers and community partners

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OBJECTIVES/GOALS: Involving community partners in translational research improves impact. Yet, community-engaged research

is challenging, and teams vary in their success. This study builds the evidence of key barriers and facilitators to effective community-engaged team science by drawing on the perspectives of seasoned researchers and community partners. METHODS/STUDY POPULATION: We conducted 3 focus groups with academic researchers (n=9) and 2 focus groups with community research partners (n=8). All participants were adults from the Southern California area, and had experience working on research teams that included academics and community partners. The focus group guide included questions about the participant's experience with community-engaged research, including the value of these partnerships, examples of success and challenges, and opportunities for improvement. Transcriptions of the focus group recordings were analyzed to identify key themes and insights, and to explore similarities and differences between academic and community participant perspectives. RESULTS/ANTICIPATED RESULTS: Both researchers and community partners saw the potential value of participating in community-engaged research. However, they identified challenges to address, including: 1) Community partners should be invited to participate in early stages of the research process as equal partners to help frame the objectives. 2) Community partner's knowledge should be valued through the use of their ideas and input, and providing monetary compensation for their time. 3) Academic researchers should aim to build long-term meaningful relationships with the community and build cultural competency (language, culture, and trust). 4) Community partners should be closely involved with the interpretation of results to confirm accuracy and identify valuable insights, and these contributions should be acknowledged. DISCUSSION/SIGNIFICANCE: Community partners being undervalued is a central challenge of community-engaged research teams. Greater adoption of best practices in team science could empower community partners and increase the value of this research. Structural barriers related to research funding and academic promotion should align to support these efforts.

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Using Contingency Management to Understand the Cardiovascular, Immune and Psychosocial Benefits of Reduced Cocaine Use: A Protocol for a Randomized Controlled Trial

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OBJECTIVES/GOALS: Contingency management (CM) procedures yield measurable reductions in cocaine use. This poster describes a trial aimed at using CM as a vehicle to show the biopsychosocial health benefits of reduced use, rather than total abstinence, the currently accepted metric for treatment efficacy. METHODS/STUDY POPULATION: In this 12-week, randomized controlled trial, CM was used to reduce cocaine use and evaluate associated improvements in cardiovascular, immune, and psychosocial well-being. Adults aged 18 and older who sought treatment for cocaine use (N=127) were randomized into three groups in a 1:1:1 ratio: High Value ($55) or Low Value ($13) CM incentives for cocaine-negative urine samples or a non-contingent control group. They completed outpatient sessions three days per week across the 12-week intervention period, totaling 36 clinic visits and four post-treatment follow-up visits. During each visit, participants provided observed urine samples and completed several assays of biopsychosocial health. RESULTS/ANTICIPATED RESULTS: Preliminary findings from generalized linear mixed effect modeling demonstrate the feasibility of the CM platform. Abstinence rates from cocaine use were significantly greater in the High Value group (47% negative; OR = 2.80; p = 0.01) relative to the Low Value (23% negative) and Control groups (24% negative;). In the planned primary analysis, the level of cocaine use reduction based on cocaine-negative urine samples will serve as the primary predictor of cardiovascular (e.g., endothelin-1 levels), immune (e.g., IL-10 levels) and psychosocial (e.g., Addiction Severity Index) outcomes using results from the fitted models. DISCUSSION/SIGNIFICANCE: This research will advance the field by prospectively and comprehensively demonstrating the beneficial effects of reduced cocaine use. These outcomes can, in turn, support the adoption of reduced cocaine use as a viable alternative endpoint in cocaine treatment trials.

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The viscous and fermentability properties of dietary fiber impact on chronic kidney disease-mineral and bone disorder*

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OBJECTIVES/GOALS: Dietary fiber has been used in other clinical populations to improve mineral disorders, but there is limited data in chronic kidney disease, despite the high prevalence of mineral and bone disorder (known as CKD-MBD). Our objective was to evaluate the effect of dietary fiber based on viscosity and fermentability on CKD-MBD outcomes. METHODS/STUDY POPULATION: 22-week-old male CKD rats (mild-to-moderate CKD) were 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). Treatments lasted 10 weeks, and rats were euthanized at 32 weeks of age (kidney failure). Rats were placed in metabolic cages for 3 consecutive days the last week before euthanasia for mineral balance. At euthanasia, blood, tibia, heart, and aorta were collected for CKD-MBD assessment. Additional tissues collected included kidneys and all intestinal segments. RESULTS/ANTICIPATED RESULTS: Our preliminary data indicates that weight trajectories and survival were similar between treatment groups. At 33 weeks of age, kidney weight index (an indirect measurement of kidney function as this animal model develops polycystic kidneys) was lower in the psyllium-treated rats compared to all of the other treatments. Plasma phosphorus was lower with Psyllium and Pectin compared to Cellulose-treated rats. Left ventricular mass index was lower in the Inulin, Psyllium, and Pectin-treated rats compared to the Cellulose-treated rats. Ongoing tissue analyses include biochemical markers of mineral and bone metabolism (parathyroid hormone, fibroblast growth factor-23, and phosphorus balance), bone parameters (dynamic histomorphometry and microCT), and cardiovascular calcification. DISCUSSION/SIGNIFICANCE: Our preliminary data indicate that dietary fiber based on fermentability and viscosity impacts CKD-MBD outcomes and may be an innovative, low-cost intervention that