Evaluation of Progress is six months after the symposium date, the co-organizers will be required to submit a 1-page report on the outcome of the symposium. A report template will be provided by the Office for Academic Integration.

**WG1: Technology WG for imaging/device technology and applications**

1. **How do we enhance awareness, avoid duplication, and self-competition?**
   - Create a Slack/Discord group for this community focused on cardiology-based research between the 3 campuses. This will enable immediate lines of communication with little to no overhead that can foster collaborations and facilitate resource sharing.
   - Collaborate on hiring individuals. Developing more streamlined processes to allow sharing of salary costs for researchers can over both long and short term can incentivize collaborations and synergize long term lab research directions towards MPI grant-focused projects.
   - More frequent seminars between the 3 campuses focused on cardiology-based research.
   - Create a website/database to house current research being pursued. Forager 1 is Cornell’s preferred tool, WCM prefers TEAMs. Matchmaking website. Pull from VIVO, lab websites, and publications, to make searchable LLM.
   - Two-way sharing mailing list for grand rounds, seminars, etc.

2. **How do we leverage expertise at both campuses for pilot studies and grant applications so it is a win-win?**
   - Form mock peer-grant review study sections.
   - Keep community small to make it manageable and avoid too much noise so people stay engaged.
   - Create methodology to facilitate concept of having a translational mindset to connect basic science to clinical applications. This should maximize success rates in grant submissions in the long term and solidify inter-campus collaborations.

3. **Are there active projects that need specific resources, services, or equipment that can be facilitated to accelerate or move a project forward?**
   - Need for better small animal transport, maybe use of C2C bus?
   - Sharing large animal models. Utilizing communication software to announce large animal studies to allow coordination to assess ability to perform IACUC approval for multiple studies on the same animal.

   - Sharing SOPs documentations.
-Sharing AI models (Github).
-Field appointments for faculty to facilitate collaborations.
-Access to buildings to visit collaborators across 3 campuses.

4. **Are there specific tangible collaborations that will likely be pursued.**
   -Ultrasound localization microscopy: Jeff Ketterling can provide to Chris Schaffer.
   -CFD for Jeff Ketterling from Jim Antaki.
   -Simon Dunham offered helping with catheter delivery systems, which Chris Schaffer suggested Nozomi Nishimura could use.

**WG2: Technology WG for translation of fundamental research to pre-clinical**

(1) **How to better leverage all the expertise at vet school, particularly for larger animal translational medicine?**
   -Need to have means (centralized place with information) for researchers to see how existing animal models can be leveraged for research protocols
   -But many research protocols are not plug and play and require additional resources. Need to get buy in from the schools to provide resources (infrastructure, space, personnel) to be able to have meaningful discoveries
   -Vet team very interested in performing cardiac MRI in animals – currently do not have training/expertise to do so. There may also be some logistical hurdles (getting access to scanner). Weill Cornell team can provide training and share cardiac MRI protocols. Technologist/faculty travel for dedicated training.

(2) **How do we incorporate input from clinicians to ensure research has viable applications?**
   -Create infrastructure for continued clinician engagement
   -Create working groups with researchers and clinicians to coordinate meetings virtually by discipline – envisioning working group leaders in areas including EP, imaging, heart failure, interventional/structural who will organize
   -Need centralized website with clinician and researcher information so that collaborations and ongoing discussions can continue

(3) **What technologies can we adapt/implement to improve imaging and quantifications of methods.**
   -Connect imaging researchers with clinicians to discuss areas of need
• ML/AI applications – vet team noted difficulty connecting with someone with expertise in these areas. Discussed enhancing collaborations with Cornell tech and also engaging trainees who may have more time/availability to engage in smaller scale projects.

(4) How do we leverage expertise at both campuses for pilot studies and grant applications?
• Leverage S10 grant, pilot grants, industry opportunities
• Explore supplements to existing NIH grants

**WG3: Clinical WG for translation of mature research to clinic**

*What are the major weaknesses in diagnostic capabilities of current cardiac imaging modalities?*
Clinical: Cost, scale (more and more images – need better technology to batch read), predict events
Vet: Can’t apply advanced methods (CT, CMR) to animals w/o anesthesia, ultrasound does not provide tissue characterization software designed for human heart, imaging analysis operator dependent
BME: need better integration; availability/awareness of resources
Proposal – infrastructure to support exchange, image analysis, technical expertise Cornell cardiology can be “go to” to shape clinical significance and “pressure test” pilot ideas; we could provide fellows and faculty for imaging expertise and data analysis

*How to share clinical data with Ithaca Engineering for improved decision making, clinical outcomes, and improved research grants (e.g., machine learning)?*
A key need is a portal-based system that can accommodate large datasets. Needs to be secure, and capable of stripping HIPAA identifiers (de-identified). Clinical data could be linked to patient level outcomes. Animal data could be stored as well, enabling above integration. Should be cost neutral.

**Would a general IRB for de-identified data that is consented be helpful?**
Yes. More broadly, needs to be “integrated” IRB such that Cornell Ithaca investigators can be added to Weill Cornell IRB w/minimal administrative headaches (vision – single institution). Sub-awards should be similarly integrated in seamless manner.

**How do we identify when projects are mature enough to translate to clinic or to pre-clinical and how do we guide the development to maximize chance for success?**
Don’t pick winners, but make easier to “fast track” projects/tools developed at Cornell Ithaca and use Weill as a real-world environment to test/validate tools being developed. Encourage dialogue, interaction.
How do we facilitate how engineers and clinical communicate and pursue projects when approaching them from different viewpoints?
Database to link investigators – something like Harvard Catalyst for Cornell.
Pilot/ seed grant awards that look for long term return.
Continued symposia like this – next year or every other year.

WG4: WG to enhance cross campus trainee opportunities

(1) What are the difficulties of a trainee working on cross campus projects?
Difficulty knowing who is working on what across campuses - Central database of skills and knowledge/needs, equipment
Communication on seminars and listservs to be able to connect postdocs - listservs across campus?
Nozomi - Ithaca has a Postdoc coordinator across campus (Christine Holmes) at WCM 1 person for 500 Postdocs
Postdoc/Grad trainee organization - Career development and mentorship across campus
Trainees are linchpin to make the bridge between the campuses - how can we activate/leverage them to be the bridge
Logistics for facilitating trainees to go back/forth between campuses: Bus timings and housing
75% of Weill Cornell trainees are not from US - how to supplement
Summer is ideal time for immersion training
Housing potential from Cornell Tech?
Emmanuel Giannellis can spearhead this connection web repository
Limited time/value of clinicians to participate in research? How is that determined?
Opportunity to increase/leverage clinical datasets and mining data for improved clinical outcomes
Lack of knowledge of where the trainees end up - limits externship/job opportunities (how to match)
Use of individual PI equipment is collaboration based, not fee for service. How to "advertise" and set up the first experiment
Lack (or presence) of clinical imaging technology at Vet that is analogous to clinical imaging at WCM
Can utilize dorm rooms in Ithaca. How to engage Tech Campus space for this?
Use of individual PI equipment is collaboration based, not fee for service. How to "advertise" and set up the first experiment
Up front travel costs for trainees - need to reduce
Climate control bus shipment system - can it eliminate quarantine process?
Developing a training grant of some sort in cardiology/engineering that can leverage expertise from both sites and support folks from both campuses.

Immersion for Weill up to Ithaca? Postdocs? Dalio Institute trainees embed up here. How could we sell to NIH T35? Existing Cardiovascular T32 for Postdoc fellows. 2-3 yr. Animal research at Ithaca? Vet collaboration Are there state funds available to support cross-campus interactions? HSS and Orthopedic Biomechanics as one prior example?

Does more “medicine” need to be in Ithaca or more “engineering or pre-clinical” in New York City?
Value improving engineering access at Ithaca and clinical access at WCM. Duplication of resources are problematic. Dalio Institute - ? Probably worth a deeper discussion. Adjunct appointment level to enable faculty to write IRB - or one IRB system Bring more clinical FROM WCM and more engineering from Ithaca (faculty, students, and postdocs) Utilize the Vet expertise at Ithaca - make that the focal point Can the IDs work between buildings?

Are there initiatives that could be put in place to make cross campus projects more productive for trainees?
NY Competitive process for supporting entrepreneurial track record faculty (matching fund) Cross-campus symposium doing more often - bring more stakeholders to lower energy barriers Seminar series at each campus - how can everyone participate? Physical visit by clinicians to deliver lecture in BME 2010 and other courses - whole day of interaction with faculty Cross-campus graduate course like 4110? Nozomi Clinical outcomes, cost-benefit analysis Luke Kim (database mining), Jim Cheung, Oilivier Elemento (UK Biobank), Dimitry Feldman (interventionalist) Program to match WCM postdocs with PhD trainees, or grad students at WCM vs. undergrad BME? Digital/Dry lab based research for undergrads after January Immersion term WCM - NY Summer Research Program (disadvantaged UG students) to advance towards medical school, SRF and ACCESS How to leverage CTSC across campus?