SenNet Consortium Meeting on

Single Cell Spatial Transcriptomics/Proteomics Technologies

August 28 and 29, 2023

Watergate Hotel
2650 Virginia Ave NW,
Washington, DC 20037
(844) 617-1972

Day 1 *(Monday, August 28, 2023)*

Exploring the Challenges

9:00 - 9:45 am	**Registration/Check-in with Catered Full Breakfast**
9:45 - 10:00 am	**Opening by Workshop Chairs and Host** (Jian Ma, Carnegie Mellon University and Hemali Phatnani, NY Genome Center, and Jonathan Silverstein, University of Pittsburgh)
10:00 - 10:15 am	**Opening/Intro by NIH** (Doug Sheeley, Ananda Roy)

Session I: Consortia Presentations (15 min) / Discussions (10 min)
Experience across logistics, technology, and analysis (Session Chair: Jonathan Silverstein, University of Pittsburgh)

10:15 - 10:35 am	**SenNet: Multimodal analysis of cellular senescence: a SenNet consortium-wide project** (Nicola Neretti, Brown University, Joao Passos, Mayo Clinic, and Vilas Menon, Columbia University)
10:35 - 11:00 am	**Human Tumor Atlas Network - HTAN** (Allison Creason, Oregon Health & Science University)
11:00 - 11:10	**Break**
11:10 - 11:30 am	**BRAIN Initiative/BICAN** (Brian Long, Allen Institute)
11:30 – 11:50 am	**Human Cell Atlas - HCA** (Jonah Cool, Chan Zuckerberg Initiative)
11:50 - 12:15 pm	**Kidney Precision Medicine Initiative - KPMP** (Sanjay Jain, Washington University in St. Louis)
12:15 -1:15 pm	**Catered Lunch**

Session II: Technologies (15 min) / Discussion (10 min)
Technology benefits, challenges, limitations and QC (Session Chairs: Alex Ropelewski, Pittsburgh Supercomputing Center (BRAIN/BICCN and HuBMAP), Jian Ma, Carnegie Mellon University)

1:15 - 1:40 pm	**Seqscope** (Jun Hee Lee, University of Michigan)
1:40 - 2:05 pm	**Visium** (Hemali Phatnani, NY Genome Center)
2:05 - 2:30 pm	**MERFISH** (Bing Ren, University of California San Diego)
2:30 - 2:55 pm	**CosMX** (Peter Adams, Sanford Burnham Prebys Medical Discovery Institute and UCSD)
2:55 – 3:20 pm	**Break**
3:20 - 3:45 pm	**CODEX (Phenocycler)** (Yu Xin "Will" Wang, Sanford Burnham Prebys Medical Discovery Institute and UCSD)
3:45 -4:10 pm	**PixelSeq** (Liangcai Gu, University of Washington)
4:10 - 4:35 pm	**4i/seqFISH** (Long Cai, Caltech)
4:35 - 5:00 pm	**Xenium** (Paul Robson, Jackson Laboratory
5:00 pm	**Adjourn** **Evening Networking – Local Restaurants**

Day 2: *(Tuesday, August 29, 2023)*

Creating the Path Forward

9:00-10:00 am	**Check-in/Catered Full Breakfast**

Session III: Processes and Analytics (15 min) / Discussion (45 min)
Logistics, QC, Data Processing, Data Integration (Chairs: Jose Lugo Martinez, Carnegie Mellon University and Phil Blood, Pittsburgh Supercomputing Center (HuBMAP))

10:00-11:00 am	**Logistics for samples across multiple sites.** **How do we streamline? How to streamline across multiple sites?** (Gloria Pryhuber, University of Rochester and Ellen Quardokus, Indiana University)
11:00 - 11:10 am	**Break**

11:10- 12:00 pm	**QC sample and data and processing. Which pipelines?** (Vilas Menon, Columbia University and Simon Melov, Buck Institute)
12:00-1:00 pm	**Catered Lunch**
1:00-2:00 pm	**Data Integration: Same technology across multiple sites? Same tissue across multiple technologies?** (Sheng Li, Jackson Laboratory and Sanja Vickovic, Columbia University)
2:00 - 3:00 pm	**Meeting integration** (action oriented final list from those collected across entire meeting of papers to write, experiments to do, standards to create, analytics to establish) - Jonathan Silverstein, University of Pittsburgh and Hemali Phatnani, NY Genome Center
3:00 pm	**Final thoughts and Adjournment**

Non-NIH Scientific Attendees not yet slotted in specific role:
Nikolai Slavov, Northeastern (Virtual)
Kay Metis, University of Pittsburgh (Virtual)
Eric Moerth, Harvard
Mark Keller, Harvard
Jose Ovando, The Ohio State University
Shoukai Kang, University of Washington
Chen Jin, Columbia
Rebecca Porritt, Sanford Burnham/UCSD
Pei-Hsun Wu, Johns Hopkins
Sadiya Shaikh, Rochester
Quan Zhu, UCSD
Jeren Hsu, University of Michigan
Samuel Peters, University of Minnesota
Alberto Pappalardo, Columbia University

Goals of the workshop (questions on which to focus)
Senescence cells are rare, morphologically challenging, and may not have the same signature across tissues. The primary goal for SenNet is a) focusing on the sensitivity/bias question and (b) specificity of knowing what is found is a senescence cell (with focus on multiplexing to reliably identify senescence cells). Specificity can be defined in several different ways (e.g. by surrounding neighborhood) while complementary things like tissue pre-processing will be much more important for sensitivity / bias.

What are the technologies that are best suited for discovery and subsequent validation of senescent cells or common neighborhoods that indicate senescence (note that discovery and validation technologies may not be the same)?

Are there new technologies that aren't being employed by any atlasing effort that need to be seriously considered?

There may be technologies that we've discounted in other programs that might be more important / significant to SenNet because you are going after rare cells, while we have generally favored throughput, reproducibility etc.

How have ongoing programs benchmarked current technologies and what lessons could be learned before starting on a large benchmarking effort within SenNet or across programs? Importantly, how are these efforts incentivized so that PIs/trainees are motivated to participate (sticks alone do not work well, there has to be some sort of golden carrot).

Roles of attendees
All participants: Consider how we can truly transform and enhance the field. Participant robustly to build the scientific collaborations needed.

Session Chairs: To lead and facilitate discussions and highlight key ideas (for capture by note takers) leveraging their unique experiences to provide a comprehensive view. It is crucial to engage the entire workshop in identifying high-priority needs that can be summarized and be made actionable during the Meeting Integration.

Session I: Consortia Presentations: Deliver presentations focused on experience and "lessons learned" from consortium efforts (executed or planned) in the area of single cell spatial technology benchmarking. Consider across the spectrum of activities such as logistics, QC samples, data processing, and analysis. Is there best practice (quantitative)? What is transferable? What can be automated?

Session II: Technologies: What is the "State-of-the-Field" for this technology? What does it do (what analytes, what resolution, what modality, what types of data does it produce)? How scalable is it (e.g. what skills are needed, how transferable, how automatable, are there best practices yet)? Why is it a good or poor choice for benchmarking efforts and likely for senescence?

Session III: Processes and Analytics: With focus in each sub-area of Logistics, QC, Data Processing, Data Integration, come prepared to present a short outline of major considerations for which scalable efforts in single cell spatial benchmarking

may require attention, and via group-wide discussion assemble areas of innovation or needing further investigation or review articles, for prioritization in the 'Meeting Integration.'

Logistic pointers:
Meeting Attendee Directory https://tinyurl.com/v56ndj63
Please find your slide and fill in the bullet points (first name alphabetically).

Presentations: https://tinyurl.com/ycknm3j7
Please upload your presentation. Please label it with your name in the file name so we may easily navigate to it during the meeting. You may email your slide deck by reply to help@sennetconsortium.org

The meeting site: https://sennetconsortium.org/fall-2023-2/

A few of you will attend virtually for reasons of illness or other travel, etc:
The zoom link for the meeting Day 1 (Aug 28) is:
https://pitt.zoom.us/j/98361764530
The zoom link for the meeting Day 2 (Aug 29) is:
https://pitt.zoom.us/j/91011281472

Finally, a reminder of SenNet's code of conduct policy:
https://sennetconsortium.org/conduct-policy/
and reminder that an assembly of leaders in a field may be deemed to be a public forum from a patent perspective.