

Identifying New Initiatives for FNL

FNLAC Meeting

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NCI Vision Statement for FNL

FNLCR is envisioned to function in support of the mission of NCI with three fundamental tasks:

- To function as a nucleus for large-scale projects
- To serve as a hub for technology development
- To sustain the extramural and intramural components of NCI

Soliciting input from the community on FNL priorities

- Input solicited from broader research community on opportunities for FNL large-scale projects and technology development hubs
- Request for Information issued in late 2020 with responses submitted in early 2021
- Series of workshops planned for 2022



FNL Community Workshops

- Gathering **input from cancer research community** on the most important needs and promising opportunities in cancer research that may benefit from a Frederick National Laboratory for Cancer Research (FNLCR) coordinated initiative
- Small workshops of **5-8 participants**
- Targeting **broad thinkers** that can consider areas beyond their own research interests
- Each participant invited to share their **one best idea for a potential FNLCR project**



Important characteristics of FNL projects

- Challenges that are emerging or currently intractable
- Research distinct from what is supported by other NCI programs
- Opportunities that are poised to make progress in 5 years
- Challenges that cannot be addressed by a single lab or small group
- Research that requires centralized coordination
- Research that requires some centralized resource or capability
- Technologies that if made more robust or widely available would have a significant impact on cancer research

FNL Community Workshops: status update



- Held 10 workshops: 8 general sessions and focused sessions on (1) AI/Computational & (2) Imaging
- Collected ideas from 58 participants
- Beginning process of organizing and categorizing ideas

Research Project Proposals



- **Drug development**

- Understand mutations and variation in the **non-coding genome**, validate **low-frequency drivers**, and understand **variants of unknown significance**
- Identify **combination therapies to overcome resistance** using liquid biopsies, high-throughput screens, computational biology, and/or targeting plasticity
- Understand the **complex biological effects of radiation** on the tumor, microenvironment, and host
- Molecular epidemiology to identify additional **environmental determinants of cancer**
- Spatial systems biology to **characterize and target the TME**, identify **ancestry-driven differences in tumor immunology**, and investigate **cellular neighborhoods**
- Develop global maps of **protein-protein interactions** and **protein complexes**
- Understand the **role of glycobiology** in cancer etiology

Research Project Proposals – Drug Development

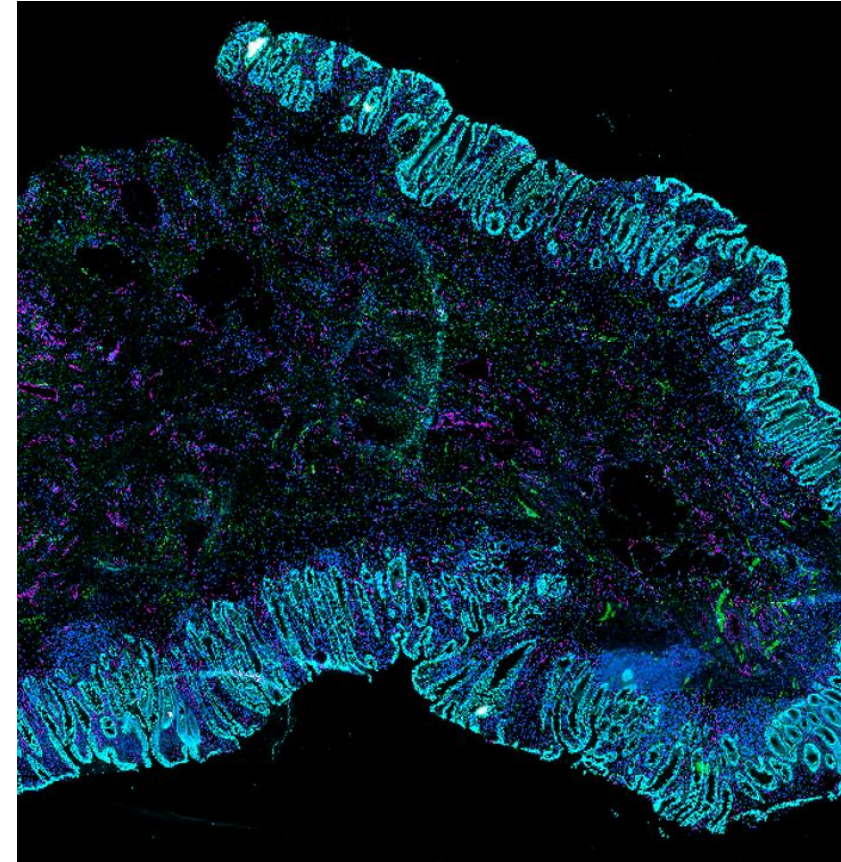
- **Myc initiative**
- **PI3K initiative** - mutant-specific PI3K inhibitors
- Assessing and targeting **p53 alterations**
- Targeting **challenging targets** (e.g., fusion proteins, TFs, telomerase, genomic instability)
- **Immune targeting of Kras** mutants
- **Bacterial** cancer therapies
- Overcoming the **blood brain barrier**
- Mapping **E3 ligase targets** to guide further development molecular glues and PROTACs

Technology / Resource Proposals

- ➔ • **Spatial Omics** / Spatial Systems Biology
 - Experimental models
 - **Pre-clinical animal** model resource
 - **Cancer organoids** resource including developing organoids that include immune components and vasculature
 - **Humanized** mouse models resource
 - Microbiome resources including standardized collection and analysis of **resident microbiome** and standardization of mouse **models of the microbiome**
 - Resource to **produce placebos** for randomized interception trials
 - **Screening platform** for therapeutics and new biology
 - Fully **synthetic ORF library** collection
 - **CAR-T resource** facility

Technology / Resource Proposals – Spatial Omics

- Provide wider **access to technologies**
- **Validated reagents** (antibodies, etc.) for mouse & humans with a focus on panels most valuable to cancer research
- Platform **comparisons**
- Continue **technology refinement**
- **Bioprinting and tissue engineering**
- Development and standardization of **data analysis pipelines**
- Assess and address **data storage and management** requirements
- **Establish spatial omics satellite cores** adjacent to labs with expertise and technologies to increase access



Next Steps



- Planning a few additional targeted workshops including on mRNA vaccines and population science
- Identify cross-cutting themes that emerged from the workshops and RFI
- Organize focused workshops for in-depth discussion of cross-cutting themes
- Discussion of highest priority ideas with FNLAC and SPL