

Mid-Atlantic NCI-CCSG Shared Resource Consortium



What is the Consortium

An Agreement among the five NCI-designated Cancer Centers that :

Provides investigators access to technologies and shared resources not available at their home institutions through simplified access and an 'in-house' fee structure

Benefits of the Consortium

- Resource sharing is cost-effective; allows resources to be invested in other priority areas
- Fulfills NCI's expectation of cross-center collaboration
- Can bridge investigators across centers
- Has been reviewed favorably by NCI during recent CCSG renewals

Diversity of Cores Available to UMGCCC

Imaging Shared Service

Confocal Microscopy
Electron Microscope
Animal Imaging
Diagnostic Imaging

Structural Biology Shared Service

NMR
X-Ray Crystallography
Cryo-EM

Genomics Shared Service

Genomics Core Facility
Genomics Resource Center
Cytogenetics Lab (clinical)
Translational Genomics Lab (clinical)

Translational Lab Shared Service

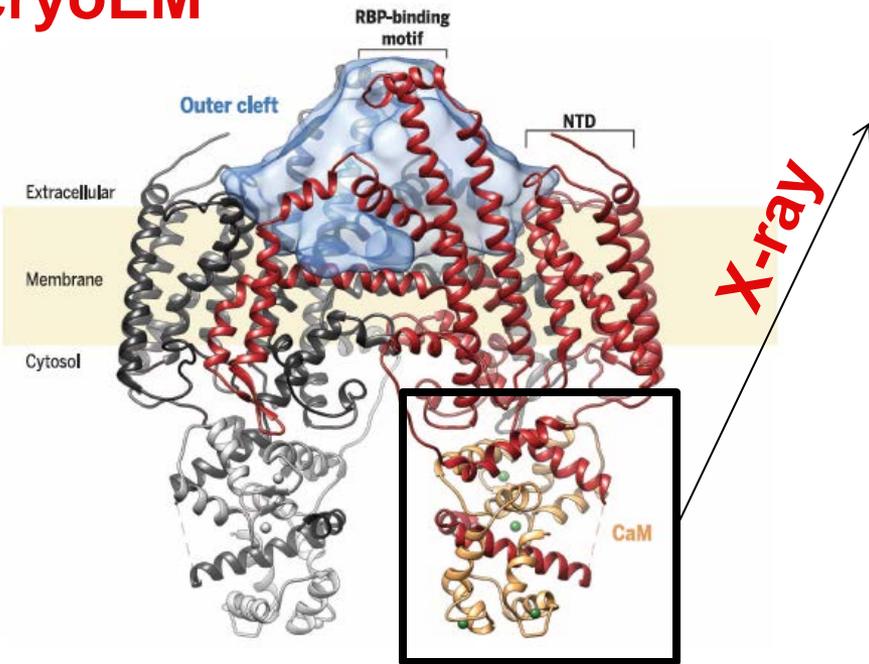
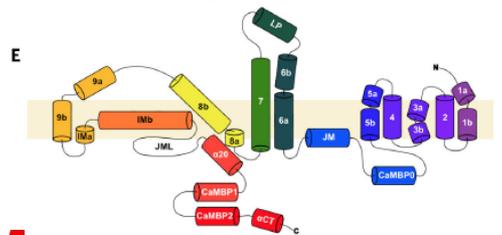
FLOW Cytometry Shared Service

Biostatistics Shared Service

Pathology Biorepository Shared Service

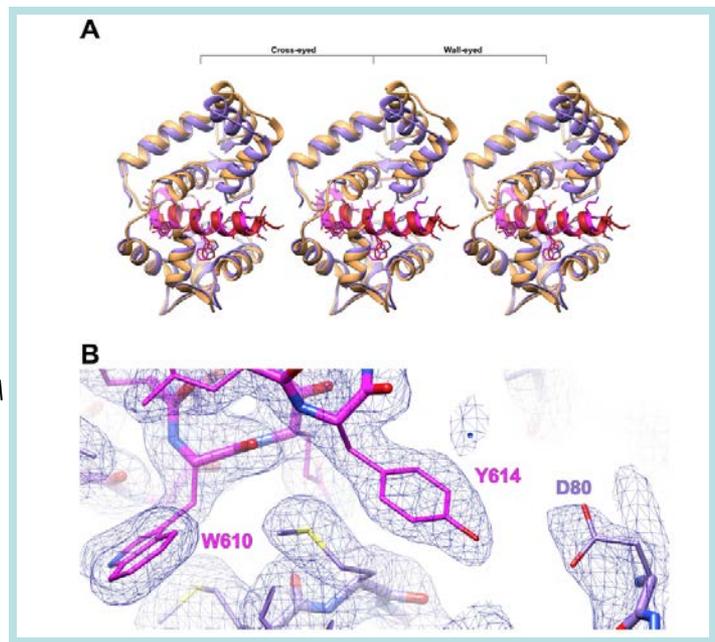
Greenebaum Comprehensive Cancer Center: Structural Biology Shared Service

cryoEM

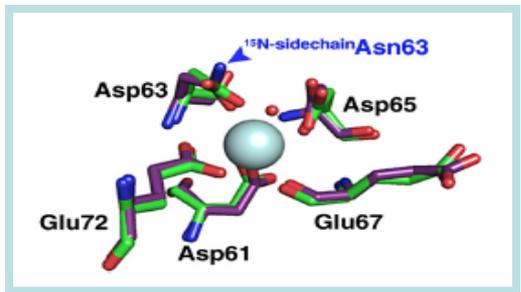


Global Structure of STRA6-CaM at 3.9 Å

X-ray



Structure of CaM-CaMB2 at 1.7 Å



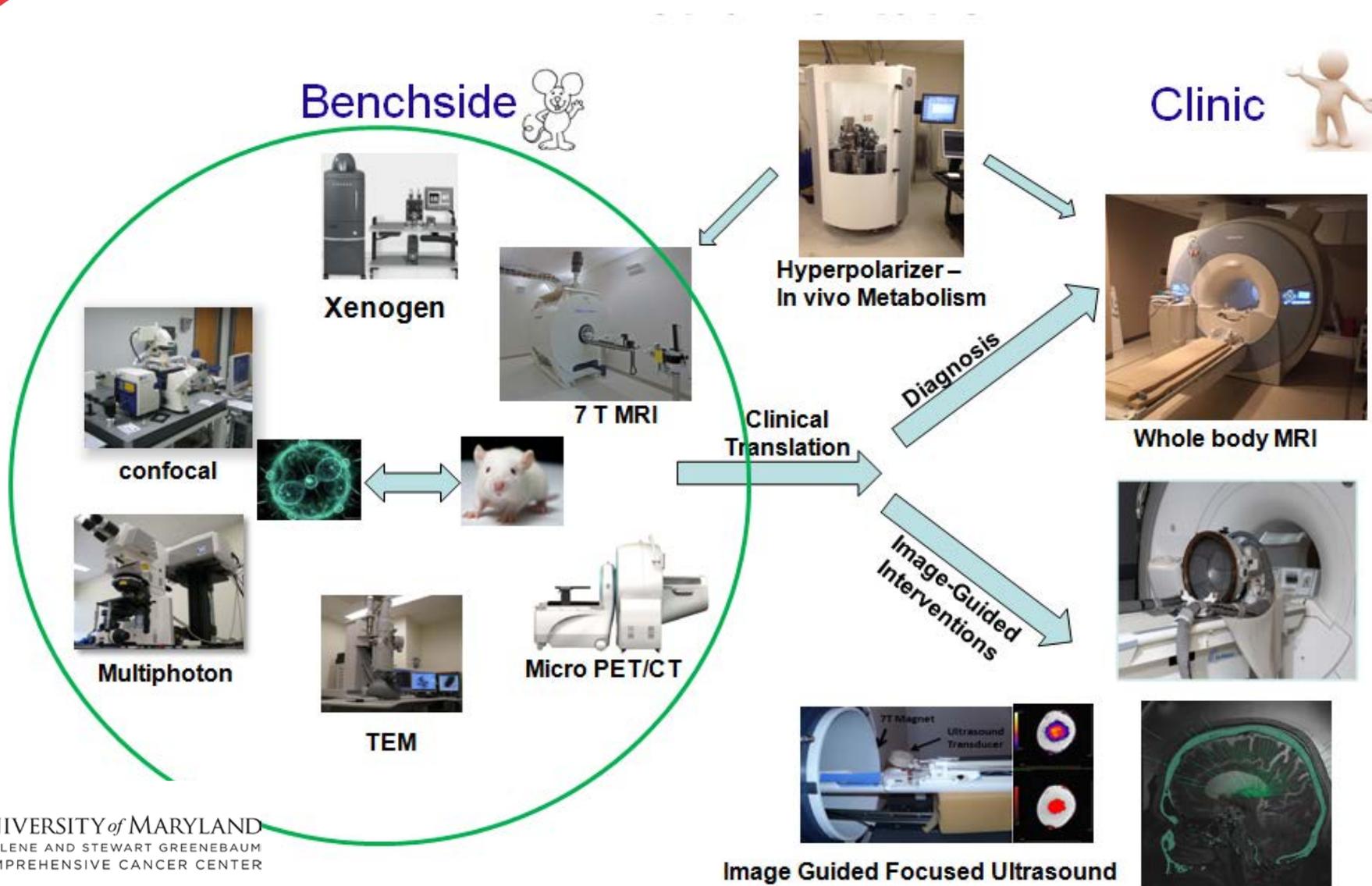
Dynamics of ligands

Detailed sidechains

NMR

Collaboration with Mancina *et al* Columbia;
Chen *et al*, (2016) **Science** 353, 887

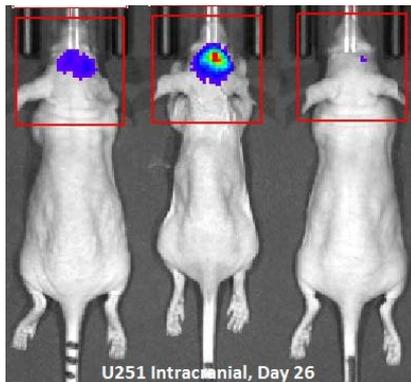
Greenebaum Comprehensive Cancer Center: Imaging Shared Service



Greenebaum Comprehensive Cancer Center: Translational Laboratory Shared Service

1. Provide UMGCCC clinicians with the means to perform early clinical trials of molecularly targeted drugs that require the assessment of pharmacodynamic endpoints
2. Make preclinical *in vitro* and *in vivo* model expertise available to UMGCCC members.
3. Facilitate the translation of novel therapeutic concepts from bench to bedside

Orthotopic Glioblastoma



Patient derived xenografts:



Breast (8)
H&N (7)
AML (1)
Pancreatic (8)

NEW
CRISPR
SERVICES
(plasmid
construction and
cell line generation)

Update On Services – GMP Production Lab

Construction complete; Summer 2018; Staff being hired



The Fannie Angelos cGMP Facility
A Laboratory for cell and vaccine production



Facility Schematic

UVA Cancer Center: Shared Resources in a Matrix Cancer Center

- Bioinformatics
- Biomolecular Analysis (proteomics, metabolomics, DNA/RNA/ChIP/Amplicon/ATAT Seq)
- FACS (cell analysis, sorting, cell imaging, Cytof)
- Advanced Microscopy (Multi-photon, confocal, Scanning/transmission electron microscopy, high content screening, molecular electron microscopy)
- Animal Models (small animal imaging, CRISPR, cryopreservation, PDX)
- Biorepository and Tissue Research
- Biostats

UVA Cancer Center: New Cores Added This Year

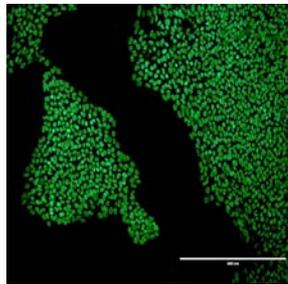
-
- Induced Pluripotent Stem Cells
 - Radiochemistry Core
 - Antibody Engineering and Technology
(recombinant antibody production, camel
antibody production, antibody humanization and
expression, protein expression)

Stem Cell Core

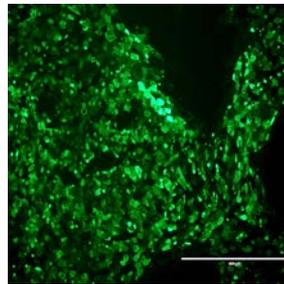
The Mission of the iPSC Core is to provide research grade iPSCs and other relevant cell types to investigators, and to facilitate the generation of clinical quality cells for human cell therapy.

Service Capabilities:

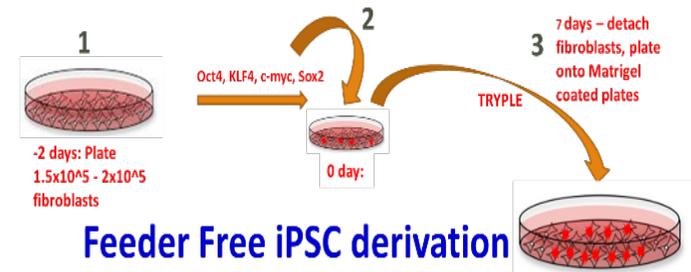
Production and Cell Banking: Organ and disease specific derived inducible pluripotent stem cells (iPSC)



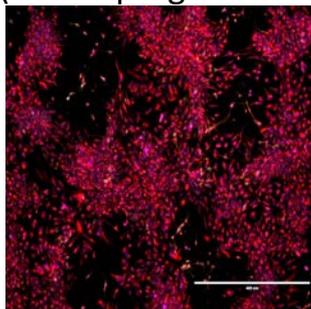
Oct 4 positive iPSCs



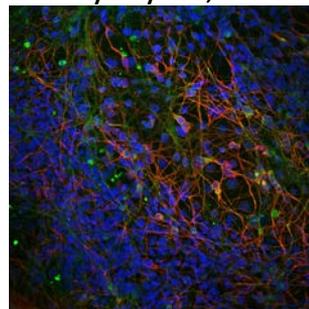
Tra1-81 positive iPSCs



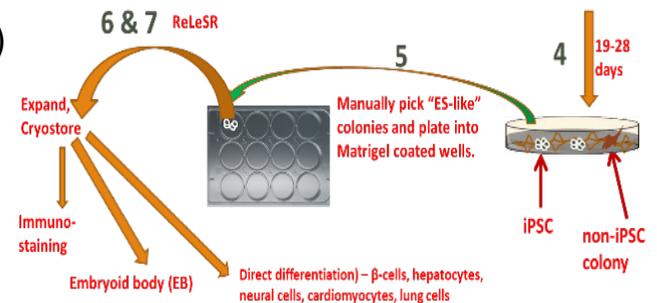
Project Development: Differentiation to various downstream lineages (neural progenitor cells, neurons, cardiomyocytes, smooth muscle cells)



Nestin (red) and Sox2 (purple) positive NPCs

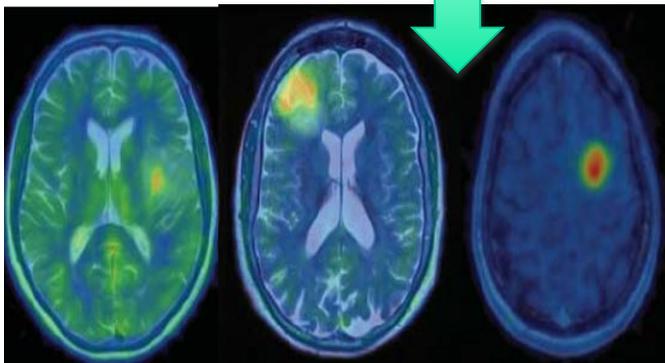


B-tubulinIII (red) and Map2 (red) positive neurons



Education and Training: One on one training available for researchers and students to learn stem cell culture techniques.

Radiochemistry Core



Service Capabilities:

Manufacture preclinical radiopharmaceuticals

- Support *in vitro* biological assays
- Molecular imaging of various preclinical models

Custom Chemical Synthesis

- Synthesize novel small molecules
- Identity standards
- Precursors for radiochemical syntheses

Manufacture radiopharmaceuticals for clinical research

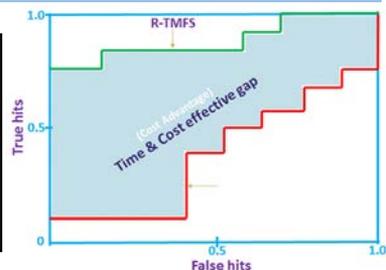
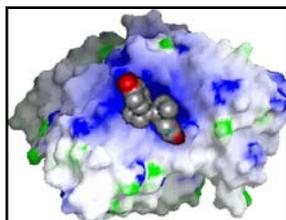
- Support PET imaging clinical trials
- Fully cGMP USP <823> compliant facility

Georgetown Lombardi Comprehensive Cancer Center: Computational Chemistry Shared Resource (CCSR)

Innovative proprietary screening and systems medicine
technologies, chemical and protein modeling.

Higher Hit Rate and Precision

- Virtual Screening, and Repurposing using TMFS & RepurposeVS
- Homology Modeling
- Protein Modeling



Predictive Analytics

DrugGenEx-Net

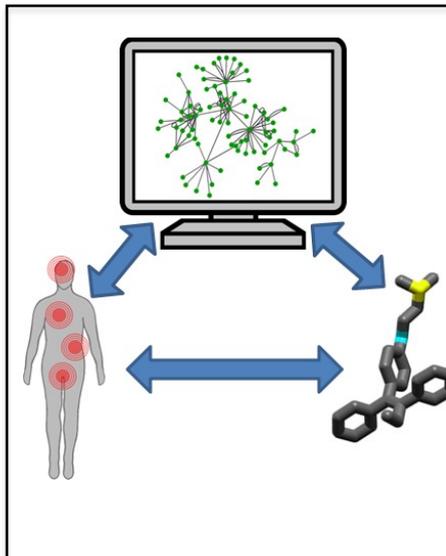
A Novel Computational Platform for Systems Pharmacology and Gene Expression-based Drug Repurposing

MSD-MAP

A Platform for Predicting Disease-linked Metabolites by Systems-based Network Analysis.

Net-SURV

Using Survival-associated Biology to Predict Drugs and Combination Therapies for Personalized Medicine.



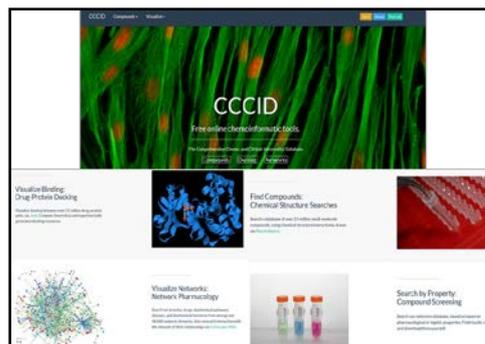
Chemo-informatics using G-DID

Screen or search a virtual database of >45 million commercially available small-molecules using interactively drawn chemical structures or pharmacological or logistic properties.

Visualize the results

Search for proteins, drugs, biochemical pathways, diseases, and biochemical functions

QSAR

A screenshot of the CCCID (Computational Chemistry Shared Resource) web interface. The header features the text 'CCCID' and 'Find online Chemo-informatics tools'. Below the header, there are several interactive panels: 'Visualize Binding: Drug Protein Docking', 'Find Compounds: Chemical Structure Searches', 'Visualize Networks: Network Pharmacology', and 'Search by Property: Compound Screening'. The interface is designed for user interaction with various chemo-informatics tools.

Dr. Sivanesan
Dakshanamurthy, Ph.D. MBA.,
Director

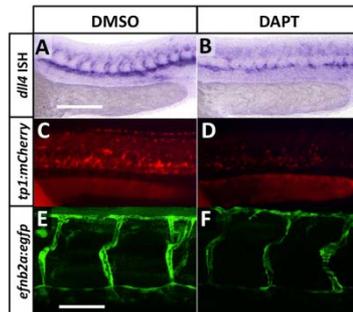
sd133@georgetown.edu

<http://faculty.georgetown.edu/sd133>

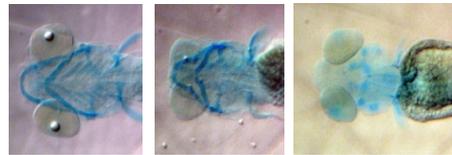
Georgetown Lombardi Comprehensive Cancer Center: Animal Model Shared Resource: Zebrafish



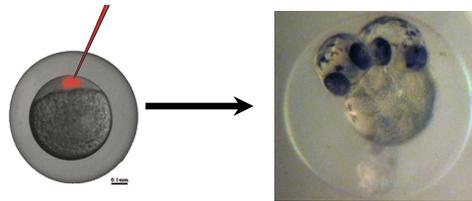
Gene Profiling



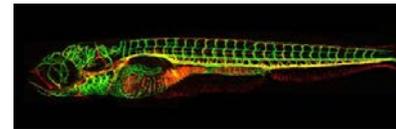
Antisense Morpholino Gene Knockdown



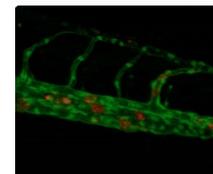
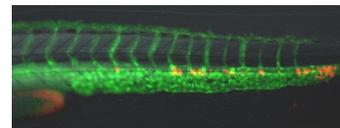
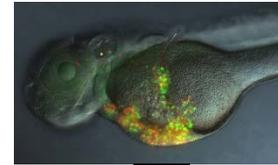
RNA/DNA injections



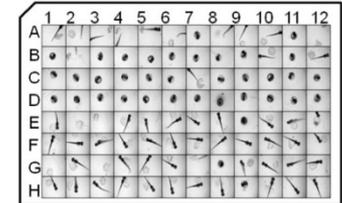
Transgenic Reporter Lines



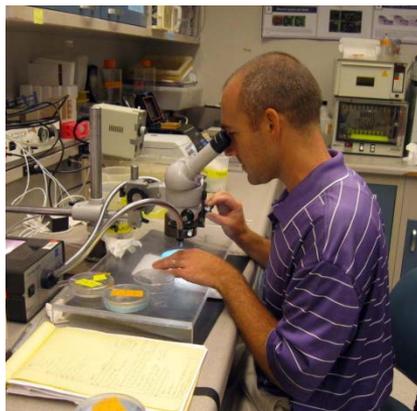
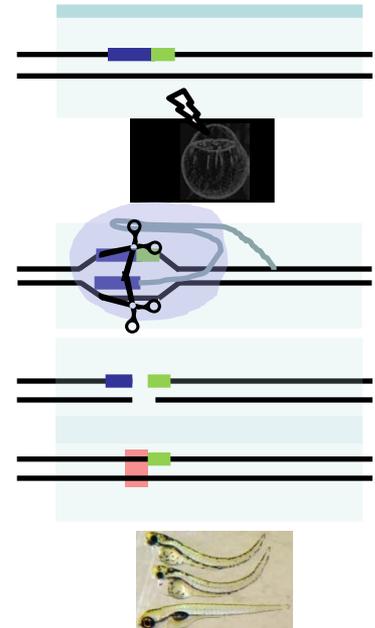
Xenotransplants



Chemical Screens



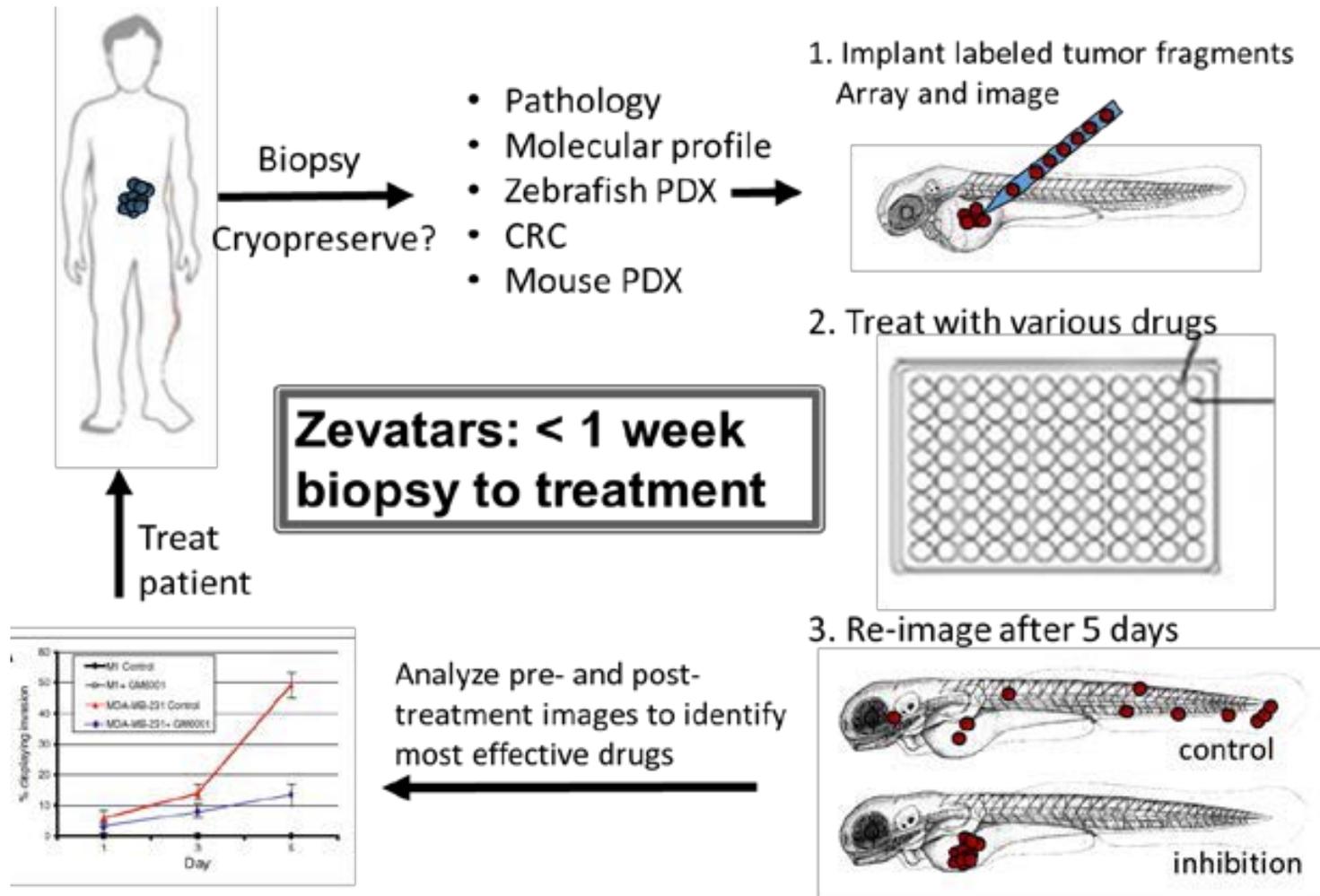
Genome Editing with CRISPR/Cas9



For more information, contact zebrafishcore@gmail.com

Zebrafish PDX Model-Zevatar

As many as a thousand replicates from a single 1mm³ piece of primary or cryopreserved tumor can be explanted in ZF embryos, allowing for extensive drug testing prior to patient treatment



SKCCC (JHU) Shared Resources

SKCCC Available Shared Resources

- Analytic Pharmacology
- GMP Biologics
- Cellular Therapy
- Immune Monitoring
- Experimental and Computational Genomics

SKCCC Shared Resources Retreat for Core Directors and Managers

Topics/Retreat focus:

- Where Science Meets Business
- Leadership vs Management
- Business Plans
- Compliance & Uniform Guidance
- Operational Issues
- Marketing
- Core Competency
- Core Identity

Nick Ambulos will be
presenting/participating.



Questions?