Request to Reissue RFAs for the Innovative Molecular Analysis Technology (IMAT) Program

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NIH NATIONAL CANCER INSTITUTE

IMAT INNOVATIVE MOLECULAR ANALYSIS TECHNOLOGIES

Motivation to Reissue the IMAT RFAs

- IMAT continues to address an area unmet by other funding opportunities
- The program consistently has highly competitive funding rates and receives a significant number of high-scoring applications
- IMAT continues to produce high-impact technologies

Outline

1. *IMAT Program Overview*
2. *Recent Evaluation*
3. *Proposed Strategy Going Forward*

Ongoing NCI Support for Technology Development

Technology Development Pipeline

Concept → Proof of Principle → Advanced Development → Testing & Optimization → Validation → Dissemination

Affordable Cancer Technologies (ACTs)

IMAT INNOVATIVE MOLECULAR ANALYSIS TECHNOLOGIES

R&STTR

rants Program

ONCOLOGY

CANCER TISSUE ENGINEERING COLLABORATIVE

NIH NATIONAL CANCER INSTITUTE Academic Industrial Partnerships

NCI-NIBIB

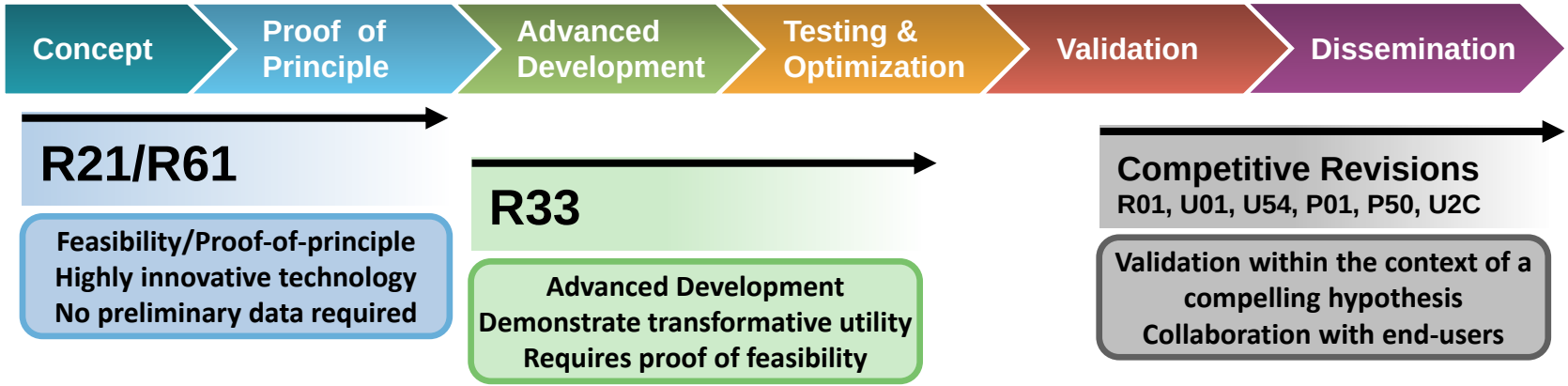
NIH NATIONAL CANCER INSTITUTE Informatics Technology for Cancer Research

CPTAC

IMAT Mission and Structure

Program Mission:

Catalyze multidisciplinary development of highly innovative technologies to grapple with the complexity of cancer biology and to create new possibilities for the fight against cancer.



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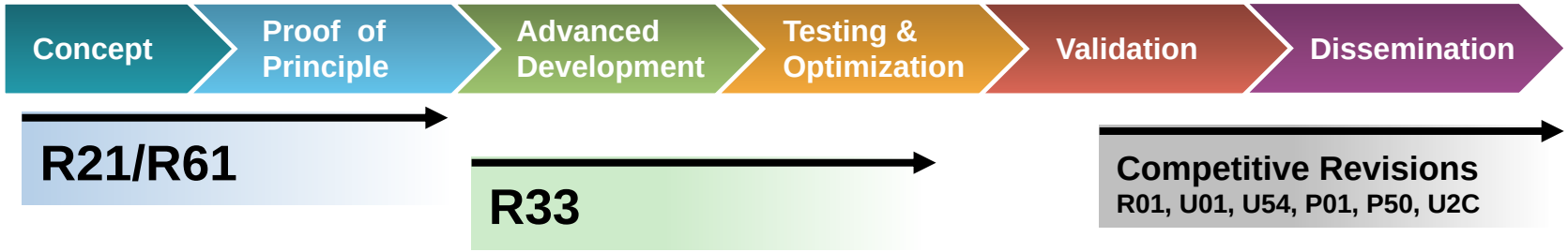


IMAT fills a unique role by supporting:

- ✓ technology development in the earliest stages
- ✓ tools that could make an impact anywhere in cancer research
- ✓ high risk/high impact projects

IMAT Program Team


Tony Dickherber, PhD


Kelly Crotty, PhD


Laurie Cynkin

National Cancer Institute

Office of the Director

CBIIT | **CCG** | **CSSI** | **CRCHD** | **SBIR DC** | **OAR**

Center for Cancer Research

Division of Cancer Epidemiology and Genetics

Division of Cancer Biology


Anowarul Amin, PhD


Steven Becker, PhD

Division of Cancer Control and Population Sciences


Danielle Mercatante Carrick, PhD


Stefanie Nelson, PhD

Division of Cancer Prevention


Guillermo Márquez, PhD

Division of Cancer Treatment & Diagnosis

Diagnostic Biomarkers & Technology Branch


Tawnya McKee, PhD


Brian Sorg, PhD

Biorepositories & Biospecimen Research Branch


Miguel Ossandon, PhD


Lokesh Agrawal, PhD


Ping Guan, PhD

Pathology Investigations & Resources Branch

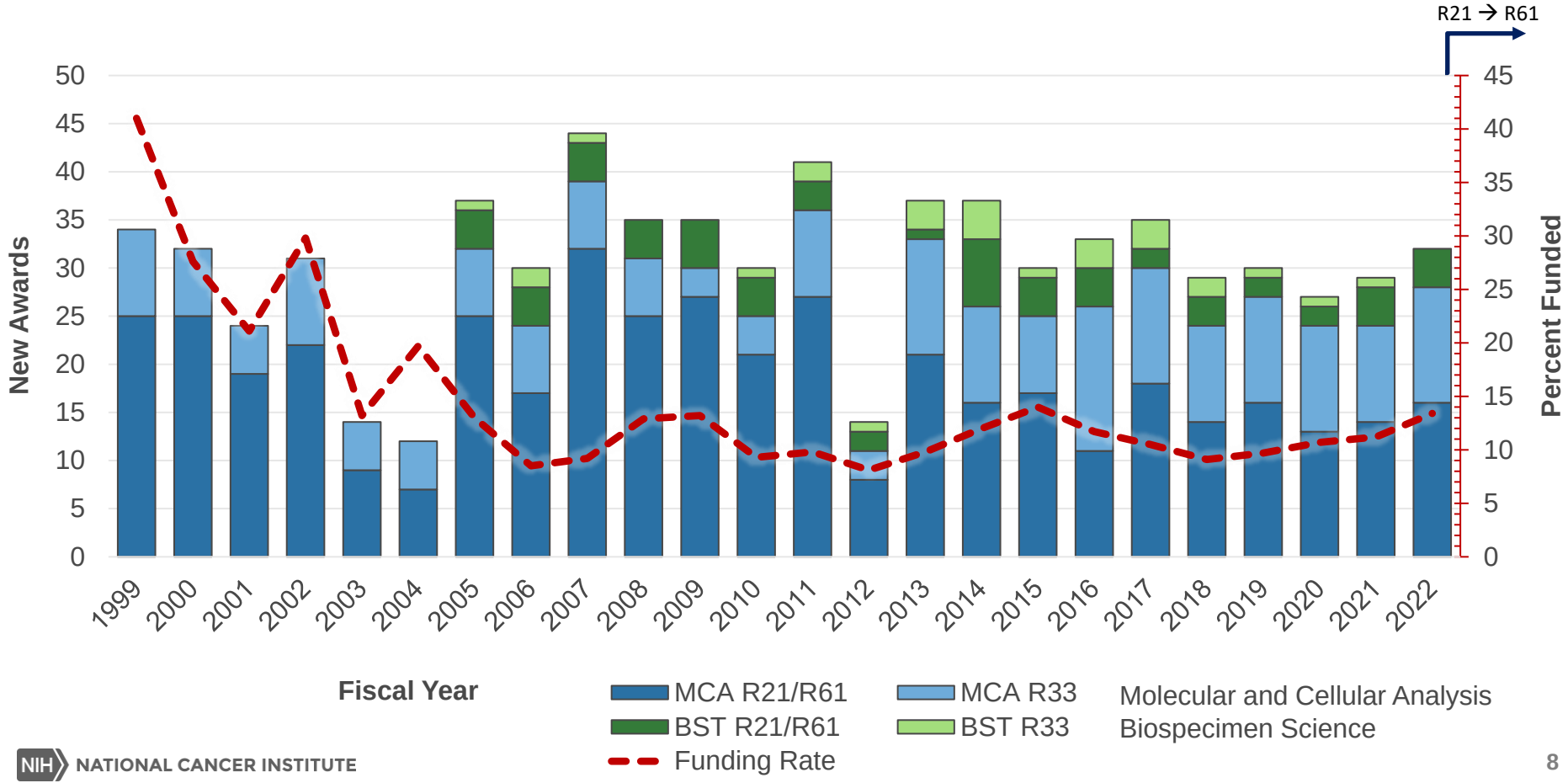

Rodrigo Chuaqui, MD

Molecular Imaging Branch

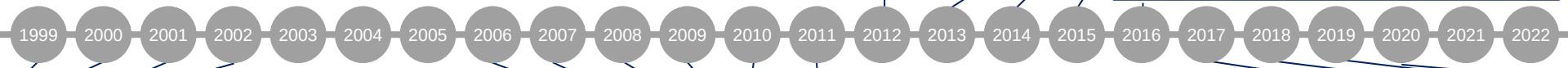

Yisong Wang, PhD

Division of Extramural Activities

IMAT Award History



IMAT Award History



Conditionally reprogrammed cells (**CRC**); *R Schlegel*
Vortex Chip; *D di Carlo*
MOW-ChIP-seq; *C Lu*

Crainbow Mouse; *M Caron & J Snyder*

Duplex sequencing; *L Loeb*
Multiplexed Ion-Beam Imaging (**MIBI**); *G Nolan*

Glycan profiling on tissue; *R Drake*

Single nucleotide Sequencing (**snSeq**); *A Regev*

Single molecule molecular inversion probes (**smMIPs**); *J Shendure*
Ultrasound-visible nanobubbles (**SignalMark**); *S Blair*

Imaging Mass Spectrometry (**IMS**); *R Caprioli*
DNA methylation hybridization (**DMH**); *T Huang*
Methylated CpG-island Amplification (**MCA**); *JP Issa*
COLD PCR; *M Makrigiorgos*

Semiconducting polymer dots (**pDots**); *D Chiu*
Oligo-selective Sequencing (**OsSeq**); *H Ji*
NanoVelcro; *HR Tseng*
Crosslinked amino acid analysis (**xAAA**); *K Hansen*

COLBERT; *A Brock*
SIMREPS; *N Walter*

Multi-photon Intravital Imaging (**MPIVI**); *J Condeelis*
DEP-FFF **(ApoCell)**; *P Gascoyne*
Protease-activatable NIR probes; *CH Tung*

Ab T cell Recall **(AbTR)**; *J Jiang*

NanoTrap; *L Liotta*
Suspended Microchannel Resonators; *S Manalis*
Cysteine oxidation probes (from KeraFast & Millipore); *L Poole & C Furdui*
Salivary protein+RNA collection device (**RNAPro-SAL**); *D Wong*
Integrated Genomics Viewer (**IGV**); *W Hahn*
Exclusion Combinatorial Refinement (**ExCoR**) for structural analysis; *K Nettles*

One-Bead One-Compound (**OBOC**); *K Lam*
Isotope-Coded Affinity Tags (**ICAT**); *R Aebersold*
Syncrotron Protein Footprinting; *M Chance*

Dynamic Range Enhancement Applied to Mass Spec (**DREAMS**); *R Smith*
Multidimensional protein ID technology (**MuDPIT**); *J Yates*
Fluorophore-Assisted Light Inactivation (**FALI**); *D Jay*
Rolling Circle Amplification (RCA); *P Lizardi*
Interactome Mapping (**Gateway ORF**); PI: *M Vidal*
Representational Oligonucleotide Microarray Analysis (**ROMA**); *M Wigler*
BeadChip & **BeadArray**; *M Chee*

Oncomap (**OncoPanel**); *L Garraway*
Genetically modified T-cells for ALL treatment; *L Cooper*
Micro-Metastasis Assay 3D modeling system; *R Kamm*
Isotopic labeling of metabolites for flux analysis; *J Rabinowitz*
3D imaging of collagen in TME; *P Keely*

GESTALT; *J Breunig*
MasSpec Pen; *L Eberlin*
MASEV; *R Weissleder*

APEX; *H Ji*
MINA; *S Wang*
SlideSeq; *F Chen*

PROTACS; C *Crews*
Activity-based Protein Profiling; *B Cravatt*

Raindance Technologies; *D Link*
Proximity Ligation Assay (**PLA**); *U Landegren*
Digital Transcriptome Subtraction; *P Moore*

Unique Attributes of IMAT

- Solicitation:
  - Requests for Applications solicits proposals exclusively focused on technology development
  - Emphasis on innovative technology with transformative potential (i.e. high-risk, high-impact)
  - Program team has control over responsiveness

- Review:
  - RFA-specific review criteria emphasizes innovation and significance
  - Special emphasis panels recruited based on focus of submissions, oriented on IMAT mission and RFA-specific review criteria

Outline

1. *IMAT Program Overview*
2. ***Recent Evaluation***
3. *Proposed Strategy Going Forward*

2023 IMAT Evaluation Panel

Wendell Lim, PhD
Professor, Dept of Cellular and Molecular Pharmacology;
Director, UCSF Center for Synthetic Immunology
University of California San Francisco

Trey Ideker, PhD (Chair)
Professor, Dept of Medicine;
Adjunct Professor, Depts of Bioengineering and Computer Science;
University of California San Diego

Peggy Farnham, PhD
Chair and Professor of Biochemistry & Molecular Medicine
W.M. Keck Chair in Biochemistry
University of Southern California

Katherine Ferrara, MD
Professor of Radiology
Division Chief of Molecular Imaging Program
Stanford University

Shelton Earp, MD
Lineberger Professor of Cancer Research
Director, UNC Lineberger Comprehensive Cancer Center
University of North Carolina

David Tuveson, MD, PhD
Roy J Zuckerberg Professor of Cancer Research
Cancer Center Director
Cold Spring Harbor Laboratory

Panel Evaluation Findings

- The IMAT program has a track record of impactful technology development
- There is continued interest in the program and consistently competitive funding rates
- The program is relatively successful in soliciting proposals from and funding young investigators
- Many IMAT investigators successfully transition to other NIH programs and/or commercialization to continue developing the technology
- The program team identifies and solicits applications in core areas of technology development where innovation is most needed

Panel Recommendations

- Improve alignment of review panels with the core IMAT mission to fund innovative technologies
- Enhance integration of IMAT with other NCI and NIH technology programs
- Increase efforts to market the IMAT program, both its success stories and funding opportunities
- Continue to encourage applications from early-stage NIH investigators
- Expand efforts to identify and target technology development areas that need funding

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Justification of Use of the RFA Mechanism

- Assurance of NCI interest in technology development
  - Address a specific need that other initiatives do not meet
- Control over responsiveness and review
  - Administrative responsiveness determination
  - Control review with special emphasis panels oriented towards program goals

Proposed Programmatic Changes

- Focus on innovation:
  - Continue categorizing applications by type of technology development to prioritize most innovative projects
  - Provide review panel with program background to align review with program goals
- Form technology interest group to coordinate outreach and connect with other NCI programs
- Leverage ongoing activities such as Ideas Labs and NCI workshops to identify technology gaps across cancer research
- Explore opportunities to further support technology development by young investigators

Summary of Request

Funding Opportunity (3 reissuances each – FY25 - 27)	Award Type	Est. Awards/ Year	Est. 1st Year Total Costs
Early-Stage Innovative Molecular & Cellular Analysis Technologies for Cancer Research (up to 3-year project period)	R61	18	$4.2M
Advanced Development and Validation of Emerging Molecular & Cellular Analysis Technologies for Cancer Research (3-year)	R33	10	$4.5M
Early-Stage Innovative Technologies for Cancer-Relevant Biospecimen Science (3-year)	R61	3	$800k
Advanced Development and Validation of Emerging Technologies for Cancer Biospecimen Sciences (3-year)	R33	2	$1M
Competitive Revisions (up to 2-year project period)	Revision to R01, U01, P50, P30	2	$500k
Total		**35**	**$11M**

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