

Research 101

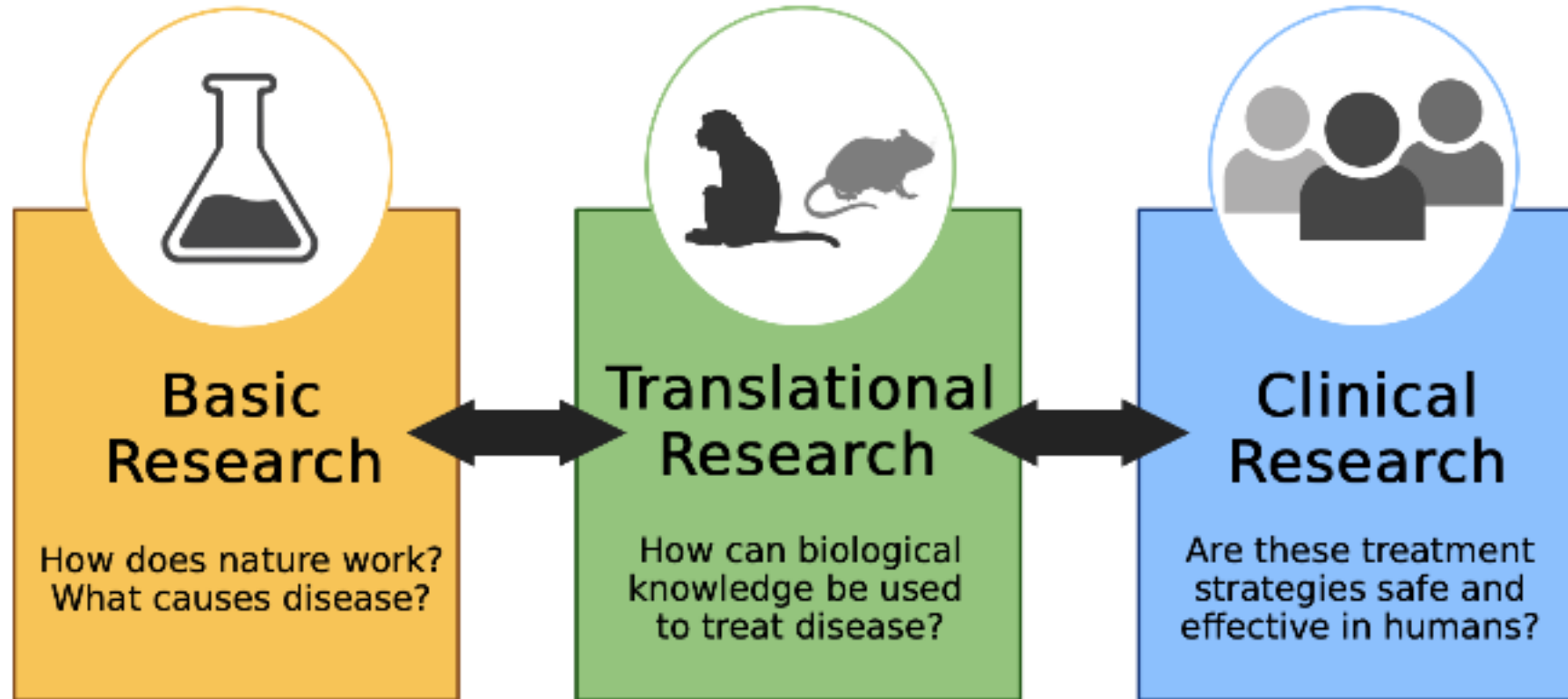
Katie Hoadley

Department of Genetics

Lineberger Comprehensive Cancer Center

Computational Medicine Program

Types of Research



Created in **BioRender.com** 

Science models

In Silico

"in silicon"



In Vitro

"in glass"



Ex Vivo

"out of a
living thing"



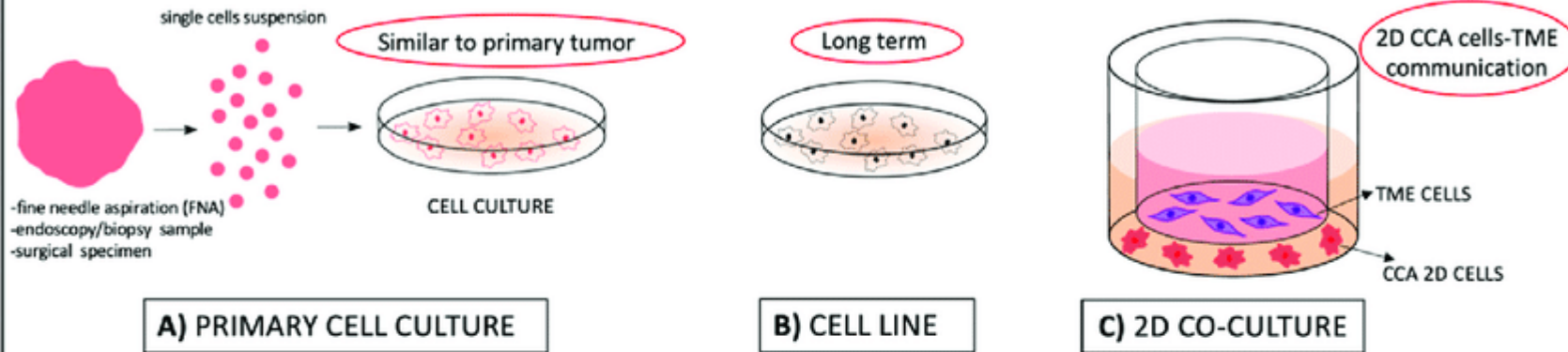
In Vivo

"in a living thing"

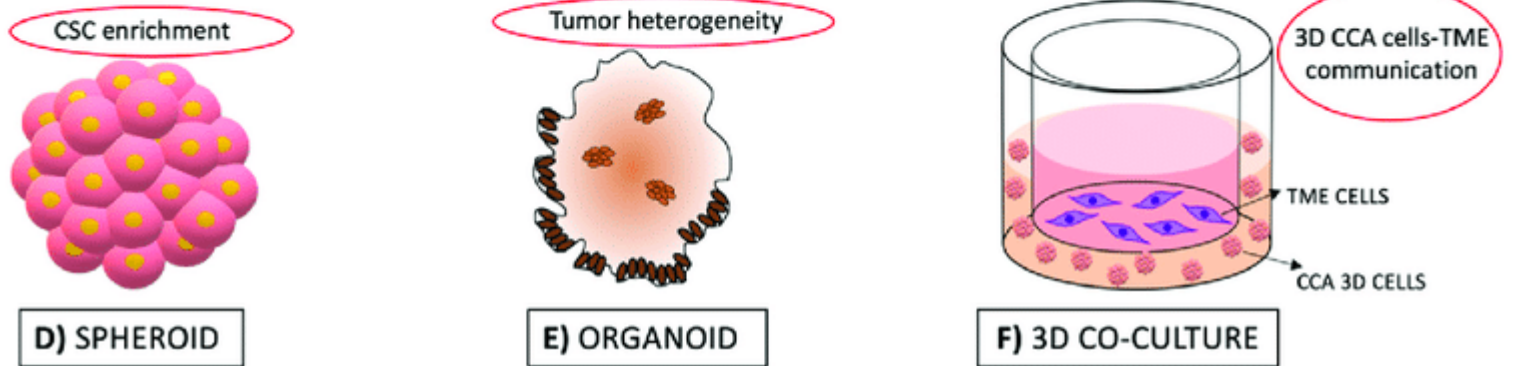


Cell Cultures

2D CELL MODELS



3D CELL MODELS



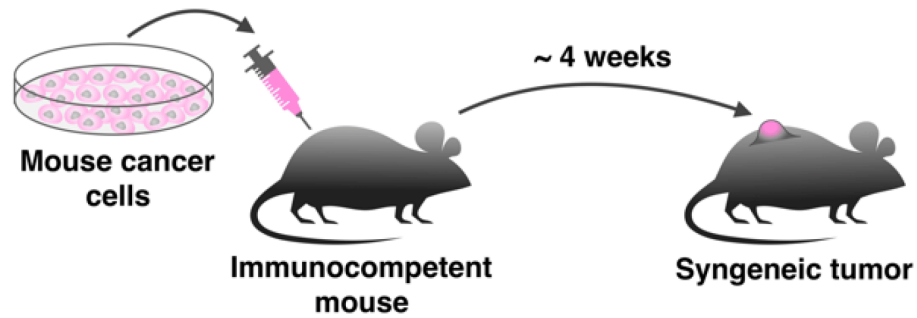
<https://www.thermofisher.com/us/en/home/references/gibco-cell-culture-basics/introduction-to-cell-culture.html>



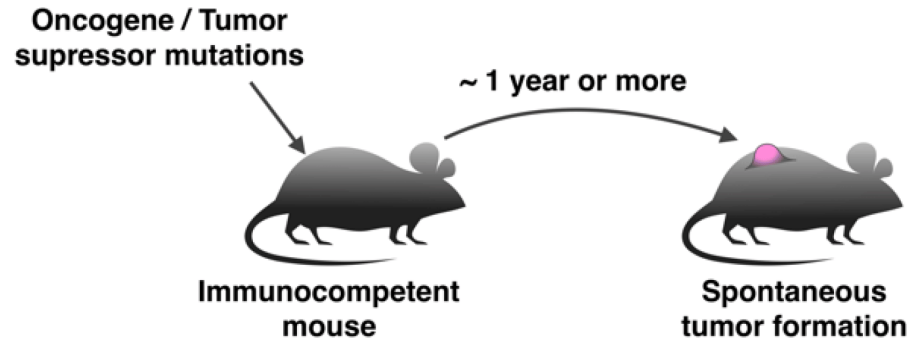
https://dk.wvr.com/assetsvc/asset/da_DK/id/20795498/contents

Mouse Models

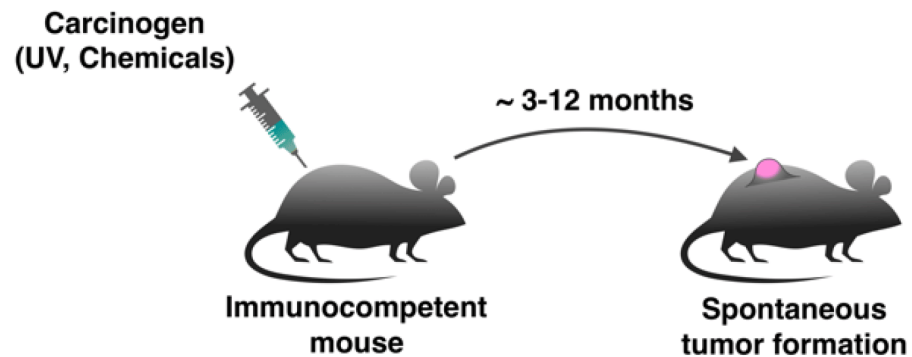
A Syngeneic Model



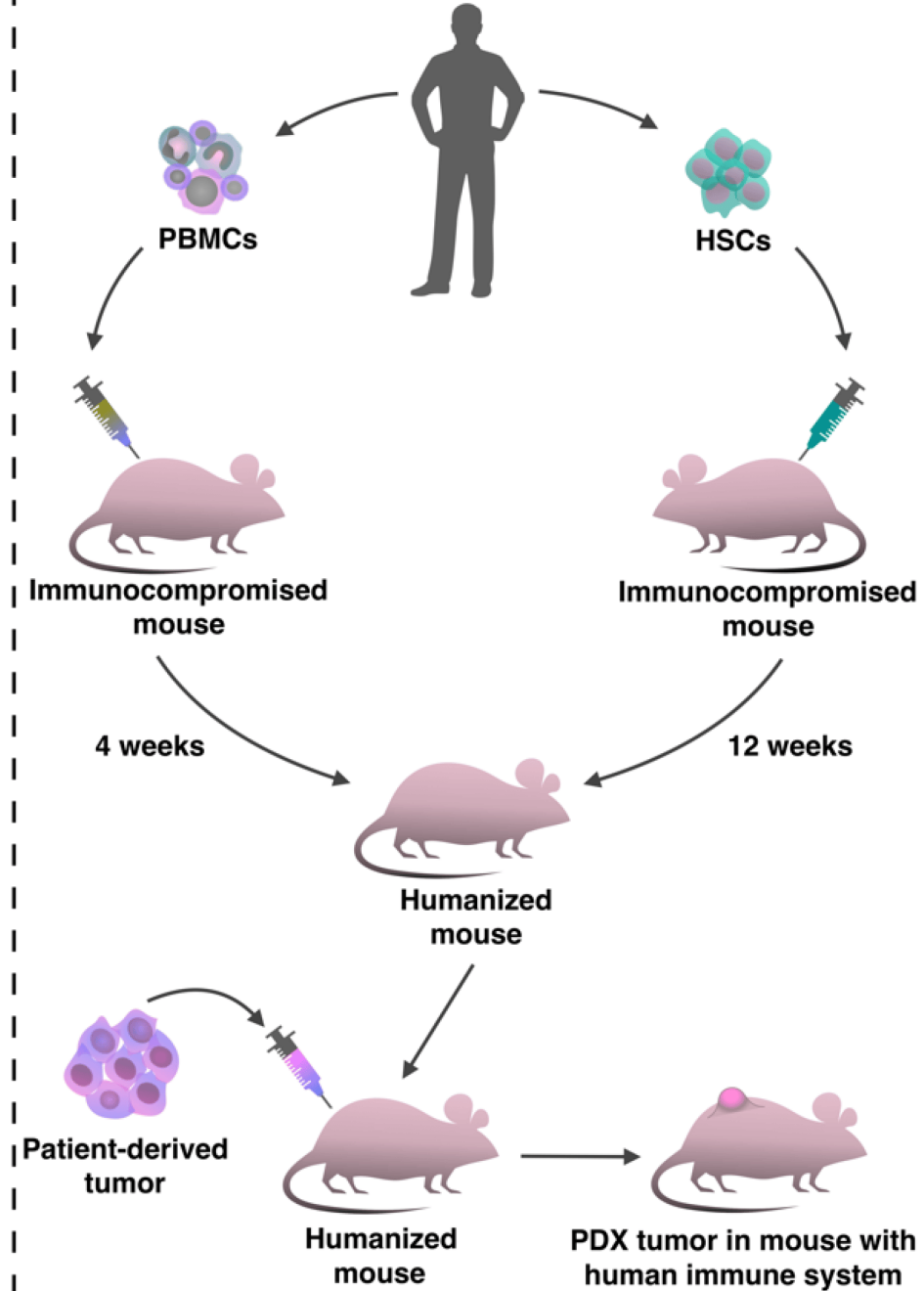
B Genetically Engineered Model



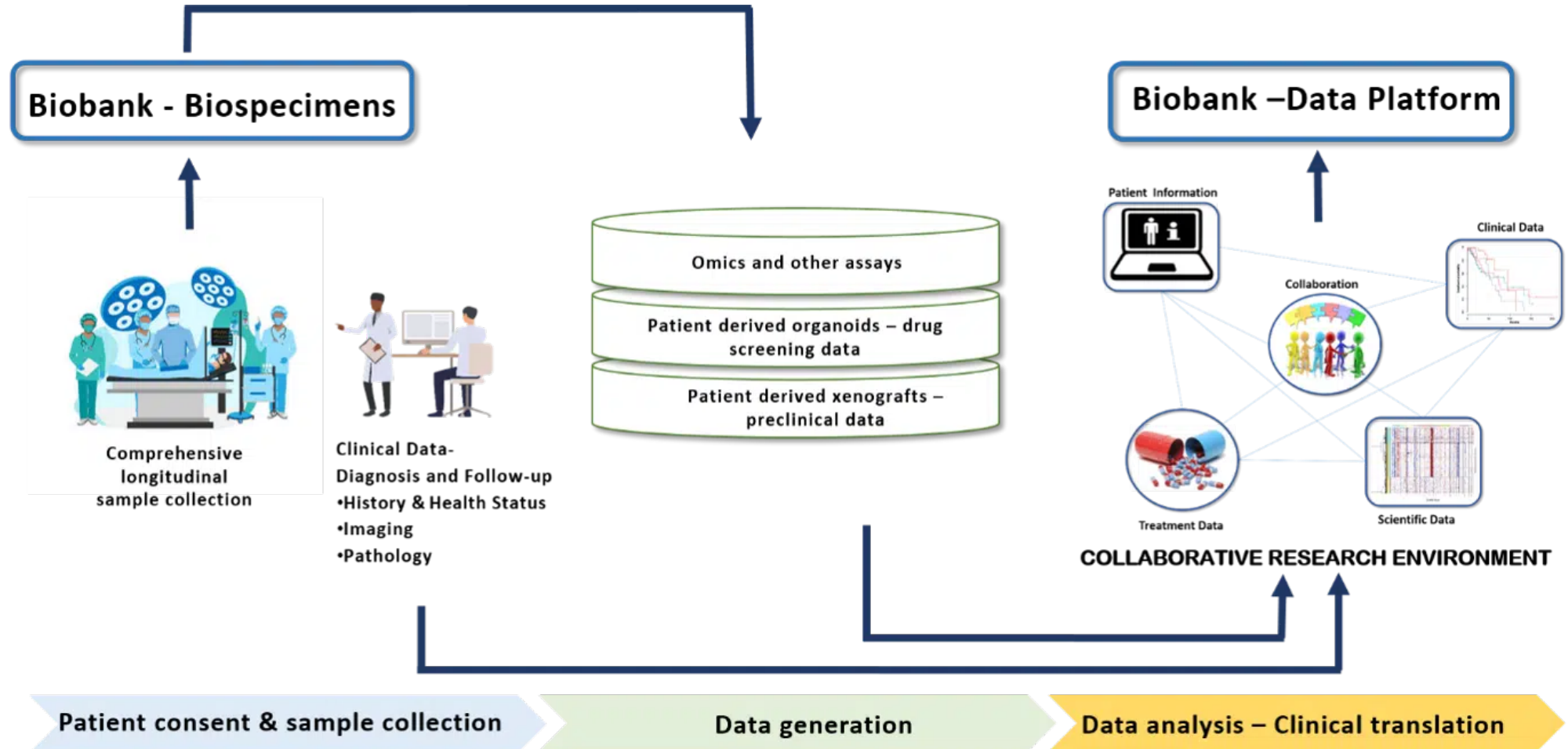
C Carcinogen-Induced Model



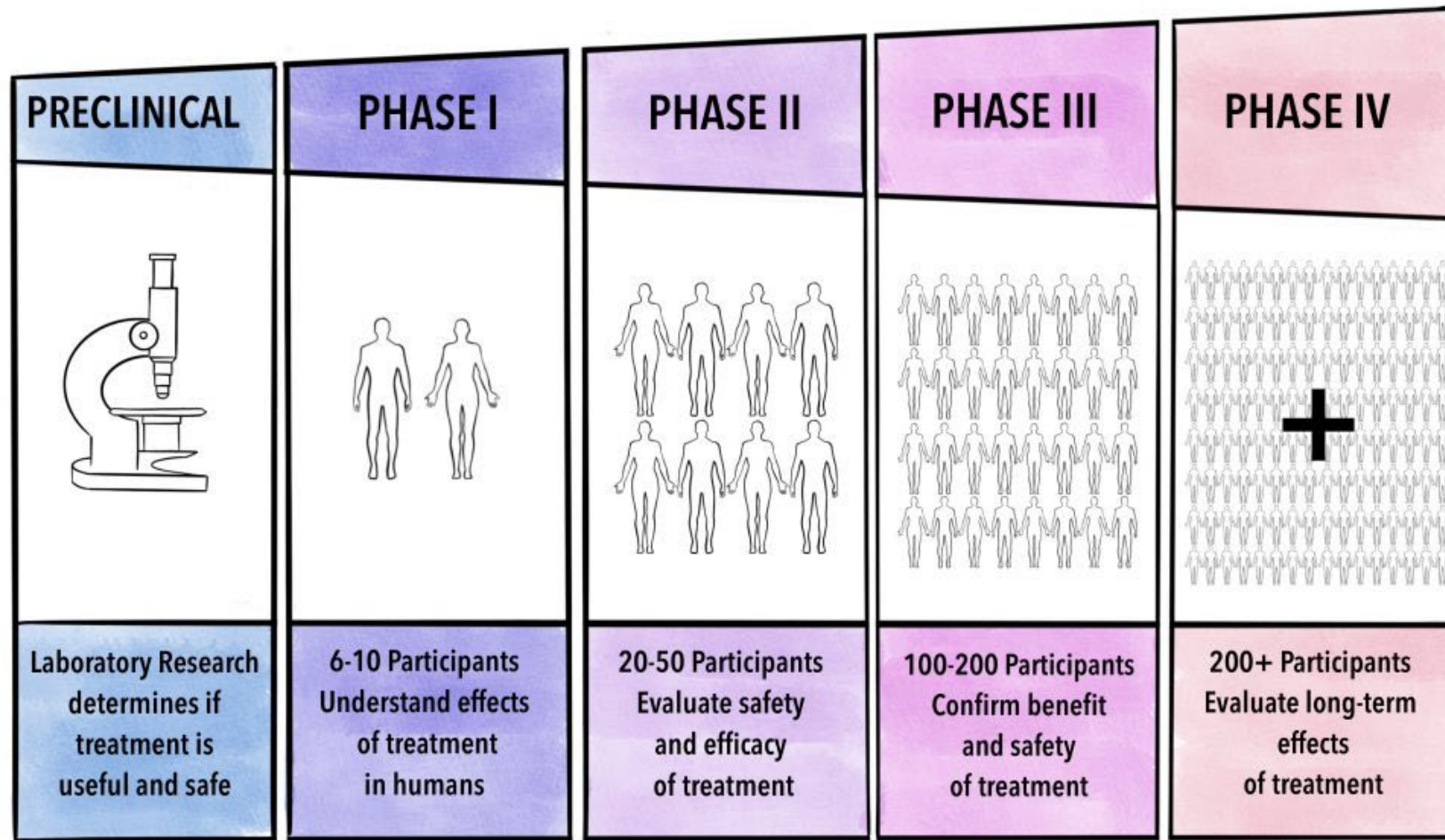
D Patient-Derived Xenograft (PDX) Model



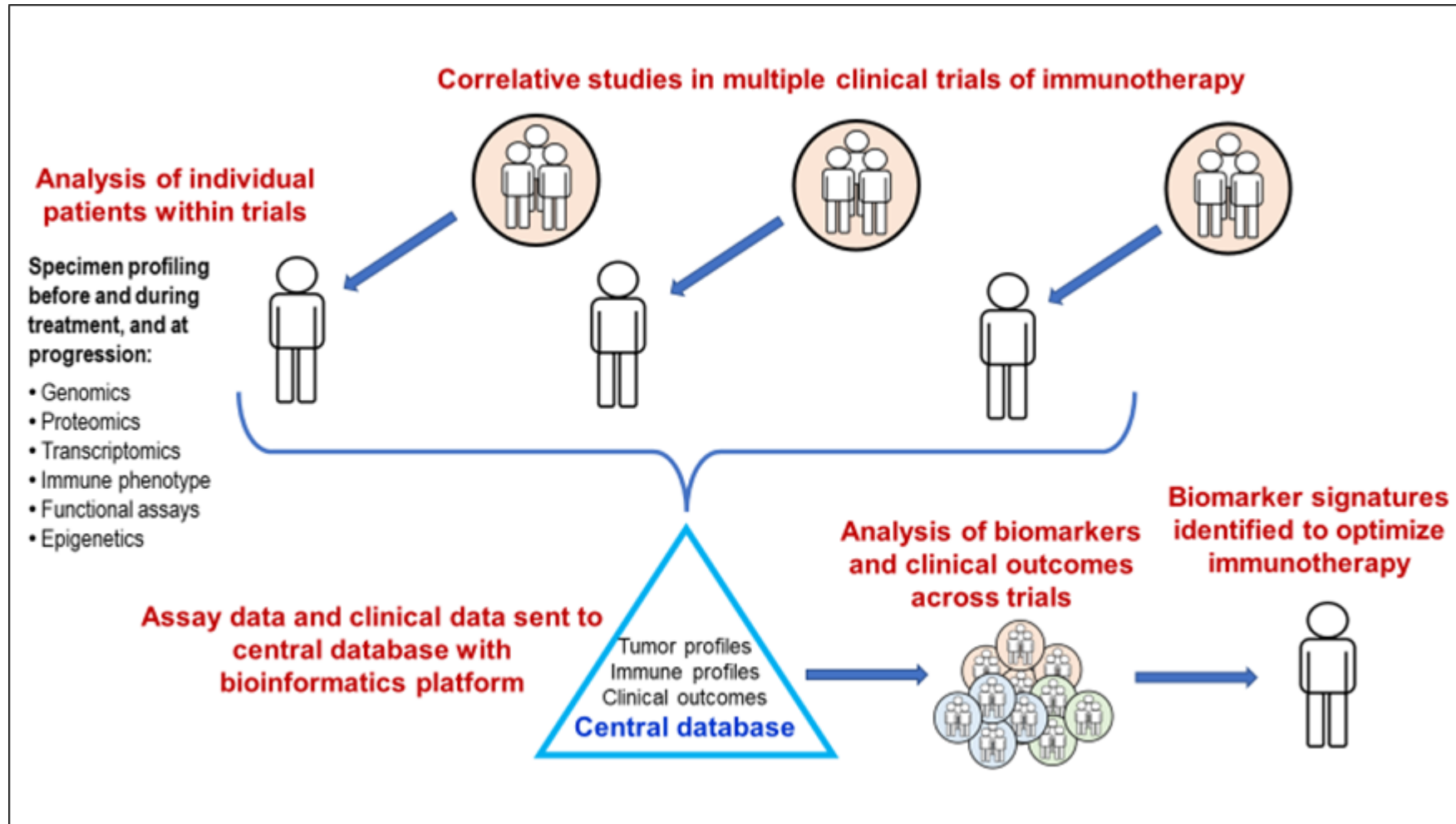
Translational Research



Clinical Trials

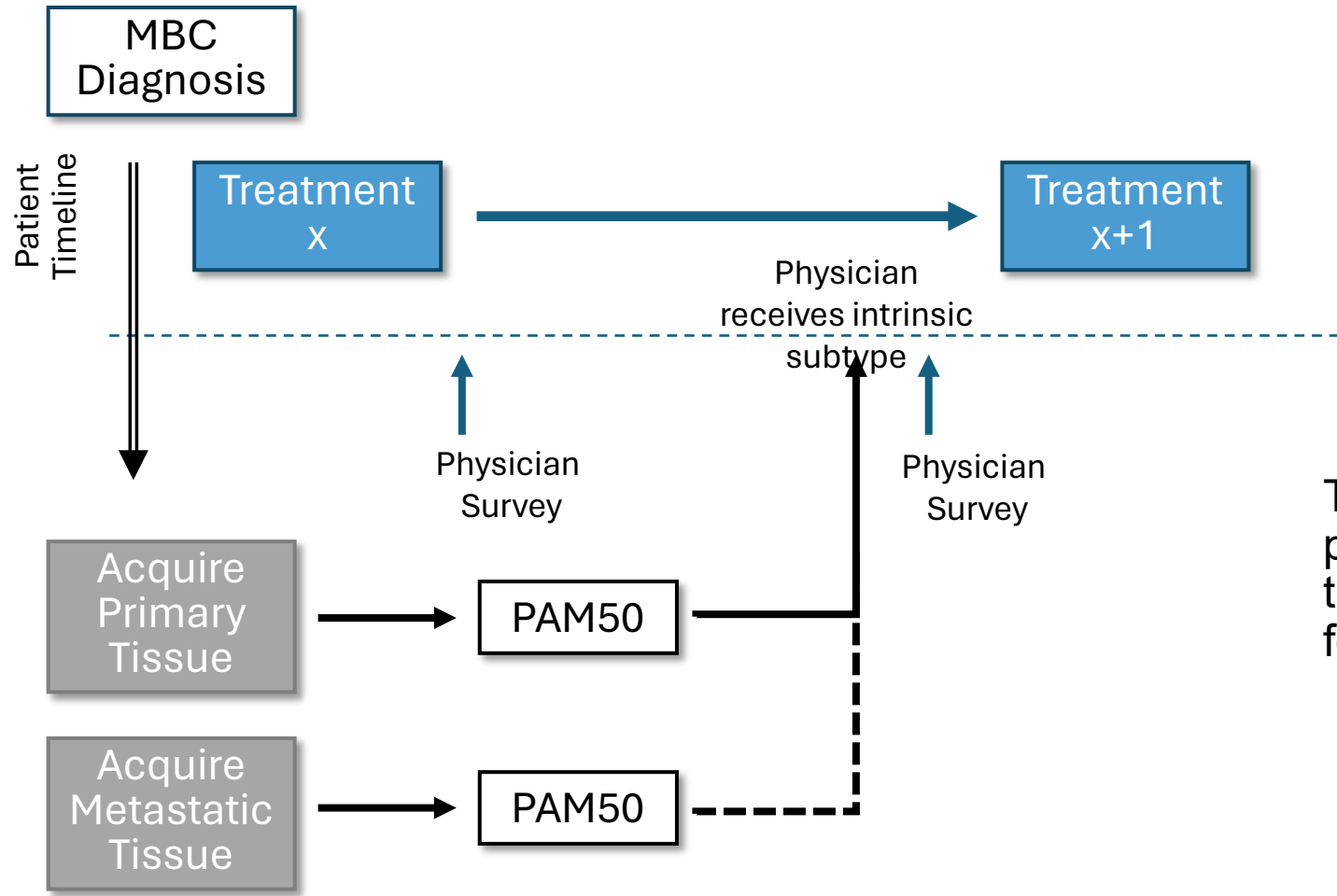


Correlative Research



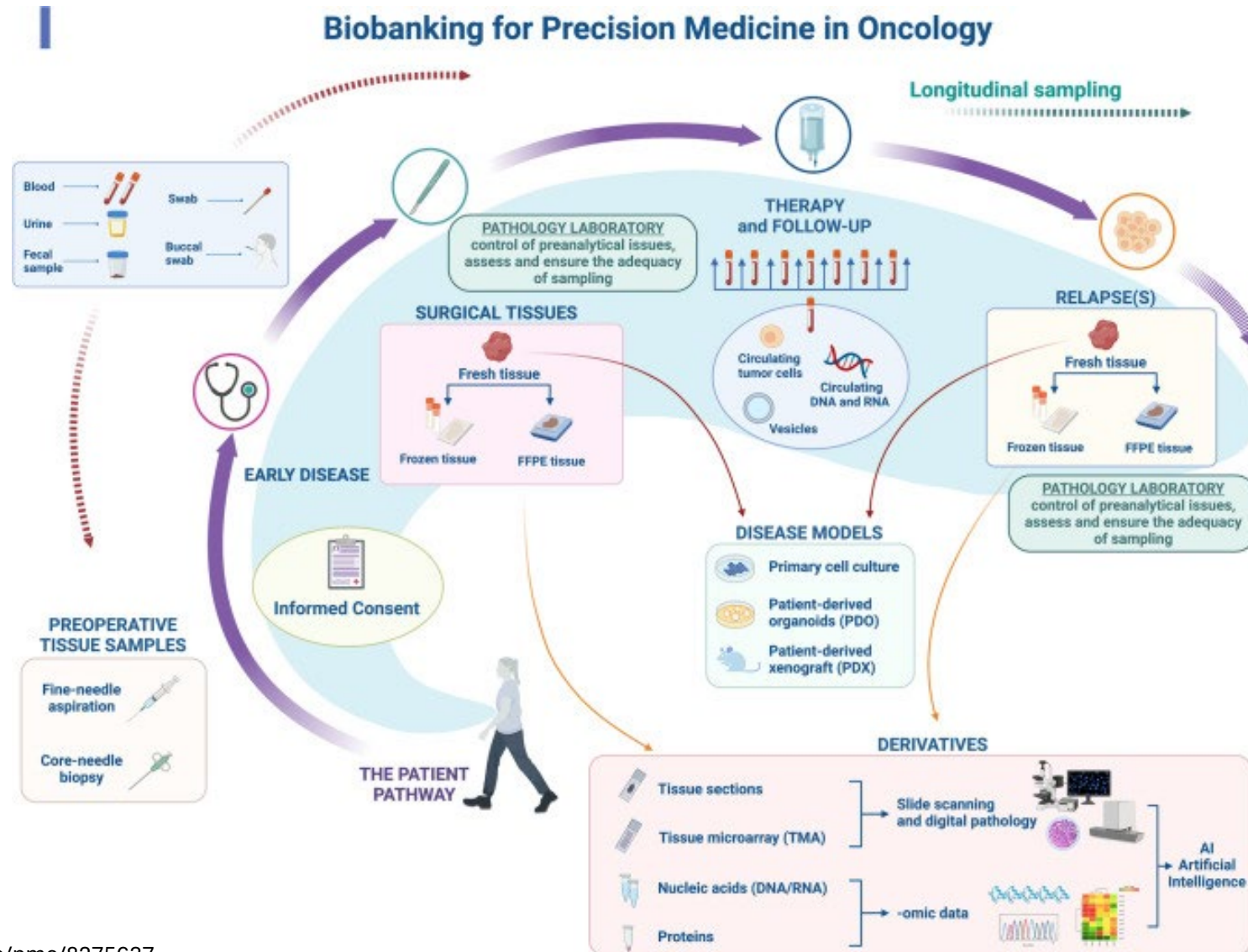
HARMONY

*Harnessing the **A**nalysis of **R**NA expression and **M**olecular subtype to **O**ptimize **N**ovel Therap**Y** for Metastatic breast cancer*



This trial will determine if providing physicians with molecular information about the tumor better informs treatment decisions for patients with MBC.

Biobanking



Lab roles

The **lab manager** helps coordinate lab needs and activities.

Postdoctoral fellows are conducting research after having completed their PhD and are well-versed in the research process.

The **lab mascot** (if applicable) boosts lab morale.

Undergraduate & high school students are gaining invaluable early experience in research.

Graduate students are seeking a master's degree or a doctorate and are relatively early on in their research careers.

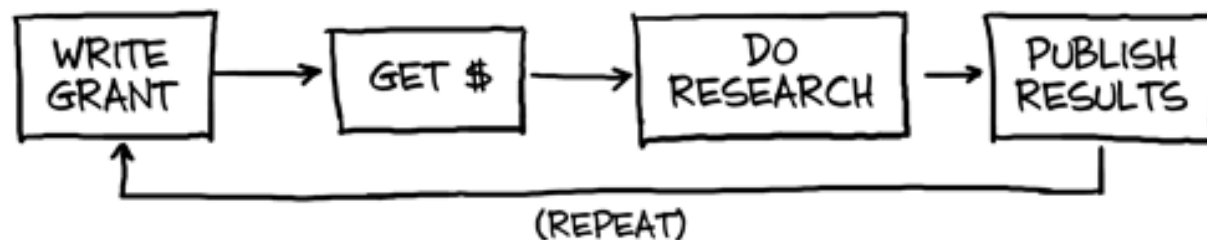
The **Principal Investigator** oversees all lab operations and members.

Lab technicians are responsible for tasks ranging from lab maintenance and organization to providing experimental support for lab projects.



THE GRANT CYCLE

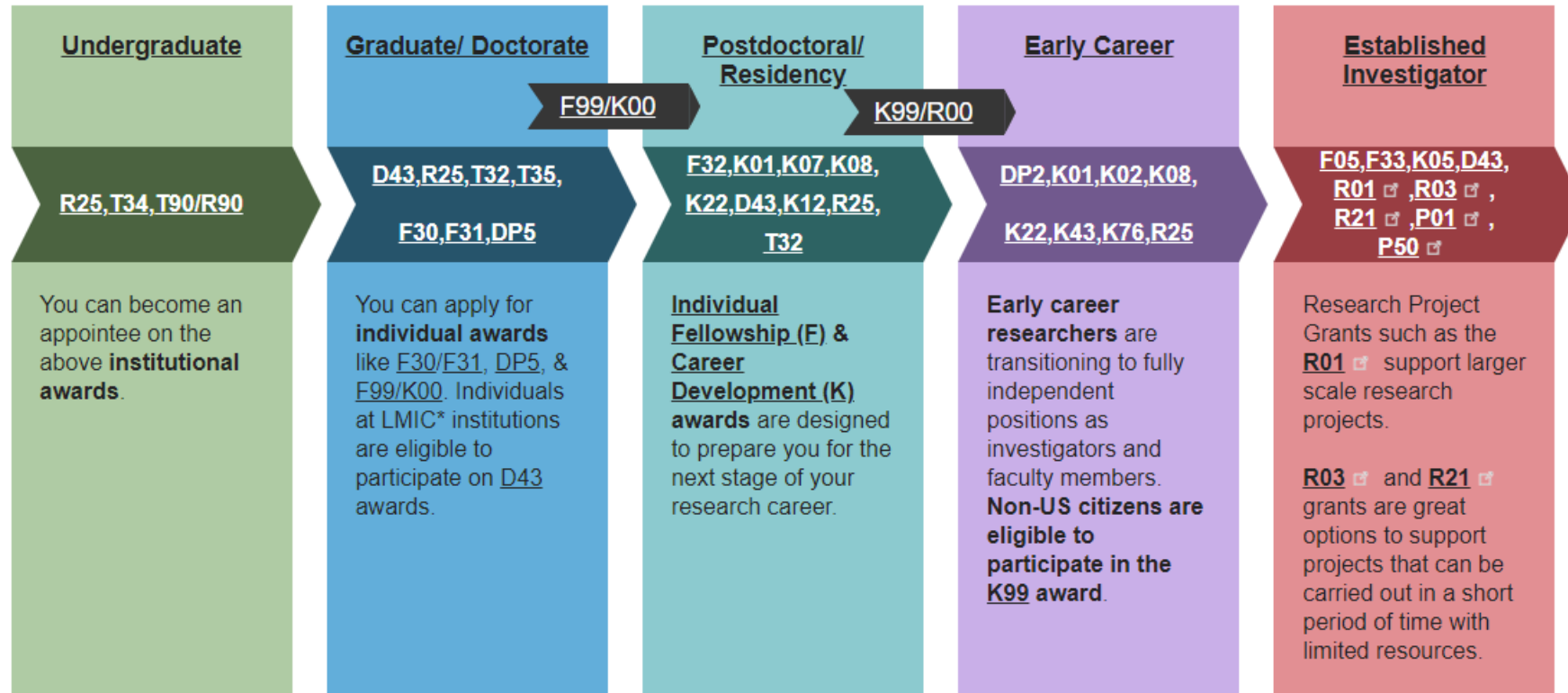
HOW IT'S SUPPOSED TO WORK:



HOW IT REALLY WORKS:



NIH Funding Programs by Career Stage



LOAN REPAYMENT PROGRAMS ☐

SUPPLEMENTS TO ACTIVE AWARDS TO ENHANCE DIVERSITY, PROMOTE RE-ENTRY, AND MORE ☐

Key	F = Fellowship	R = Research	P = Program Project/Center
	K = Career Development	T = Training	

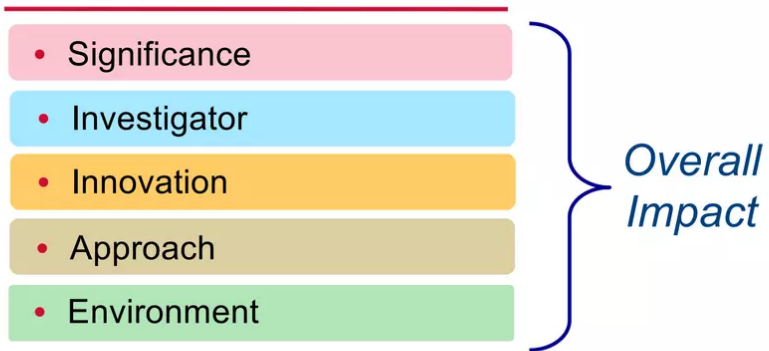
*LMIC = Low-and-Middle-Income Country

R01 Grant Sections

- Face Page
- Table of Contents
- Performance Site
- Project Information
- Project Description: Abstract
- Project Narrative: 2 sentences
- Facilities and Other Resources
- Equipment
- Key Personnel
- Biosketches
- Budget (all years)
- Budget Justification
- Cover Page Supplement
- Introduction (resubmission only)
- Specific Aims
- Research Strategy
 - Significance
 - Innovation
 - Approach
 - Preliminary Data
 - Research Plan
- Protection of Human Subjects
- Women & Minorities
- Planned Enrollment Table
- Children
- Vertebrate Animals
- References Cited
- Multiple PI Plan
- Letters of Support
- Resource Sharing
- Authentication of Key Biological and/or Chemical Resources
- Checklist

Scored Review Criteria

Investigator Initiated R-series Grants



Overall Impact or Criterion Strength	Score	Descriptor
High	1	Exceptional
	2	Outstanding
	3	Excellent
Moderate	4	Very Good
	5	Good
	6	Satisfactory
Low	7	Fair
	8	Marginal
	9	Poor

- **Criterion Score**
 - Whole numbers: 1-9
 - 1 (exceptional); 9 (well let's just hope you never get a 9)
 - Given by reviewers but not discussed at study section
 - Provided in Summary Statement of all applications
- **Overall Impact Score**
 - Not the mean of the criteria scores
 - Different criteria are weighted by each reviewer
- **Final Impact Score, Percentile**
 - Mean of all scores x 10 > 10 – 90
 - Percentiled against R01s applications across 3 meetings

Grant Review Timeline



Funding Levels

NCI Research Project Grants Funding Policy for FY 2023

Competing Grants		Noncompeting Grants
TYPE	PAYLINE	
R01 Grants for Established and New Investigators	12th Percentile	Will be funded at 98% of the committed level. Exempt from the 2% reduction: <ul style="list-style-type: none"> • Training awards • R00, R03, R50 • SBIR/STTR awards • P30 Cancer Center awards
R01 Grants for Early-Stage Investigators	17th Percentile	
R21 Exploratory Grants	9th Percentile	