



# Population Genomics in Health Systems

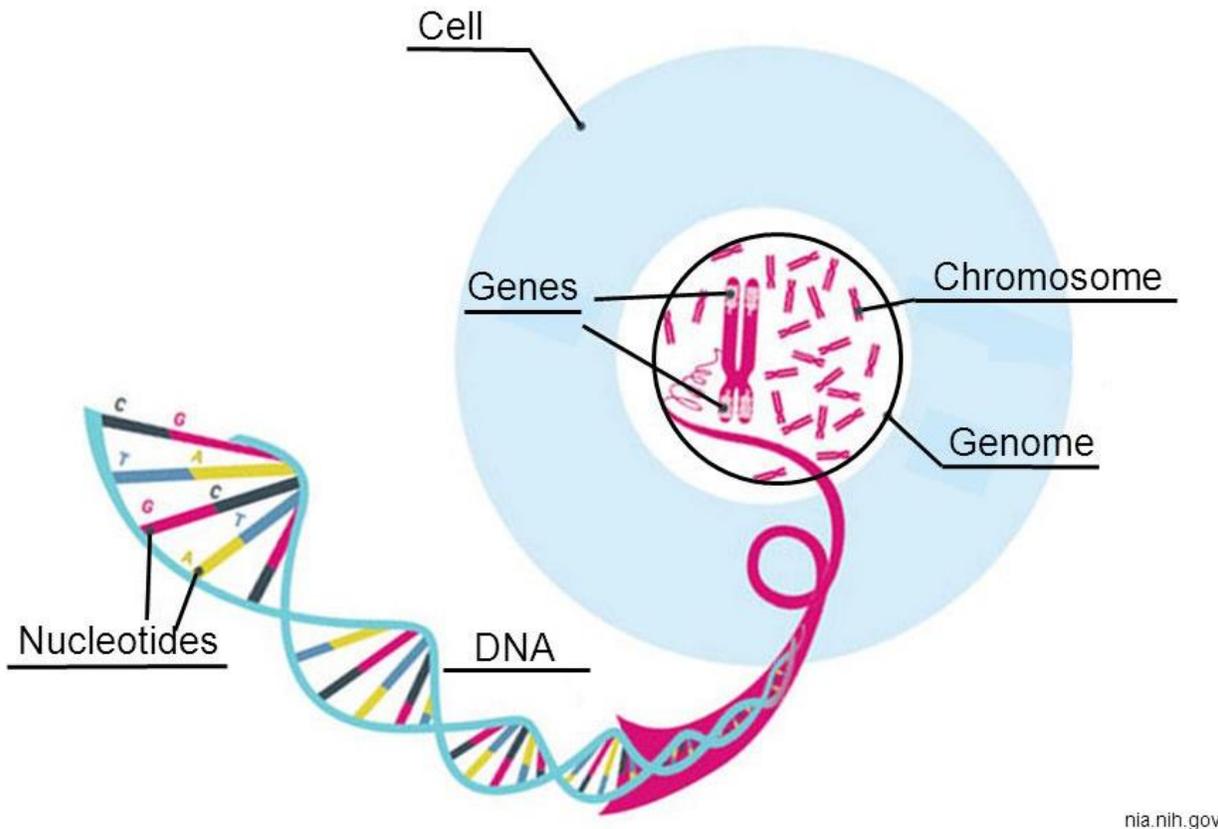
*October 16, 2019*

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Intermountain Healthcare Precision  
Genomics  
The Leadership Institute*

Helping people live the  
healthiest lives possible®  
...through Precision Health



# Precision Medicine and Genomics



Each human cell normally contains 23 pairs of chromosomes (46 total)

Humans have between 20,000 and 25,000 genes

A genome is an organism's complete set of DNA, 3 billion individual bases

Precision medicine leverages genomics to provide tailored health solutions

# What's the Difference?



**Precision Medicine**



# Precision Medicine and Precision Health

- Predict and prevent disease
- Improved outcomes, reduced costs
- Population management
- Innovation engine
- Accelerate discovery

# Precision Medicine in the Clinical Programs/Services/Specialties



CV



Primary  
Care



Surgery



MSK



W & N



Behav



Specialty



ICU



Oncology



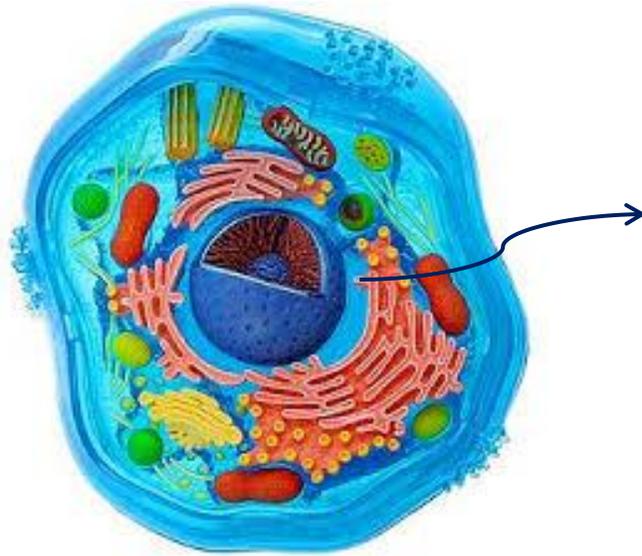
Peds



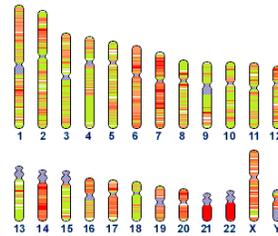
Neuro



# Precision Medicine in Cancer: how does it work?



Cancer cell

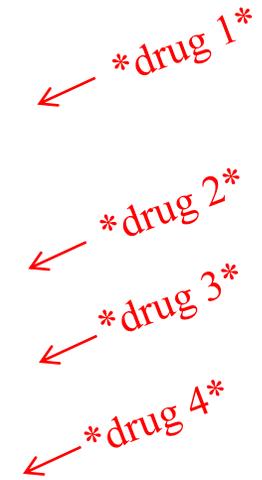


Genome analysis



## Variants

1. FGFR1
2. P53
3. MEK1
4. EGFR
5. HER2



Precision treatment

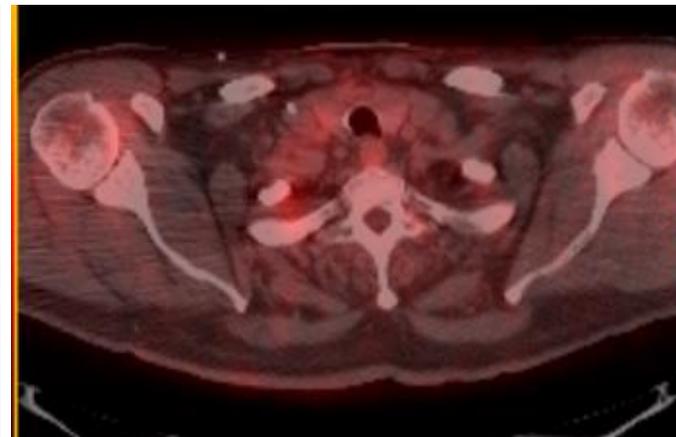
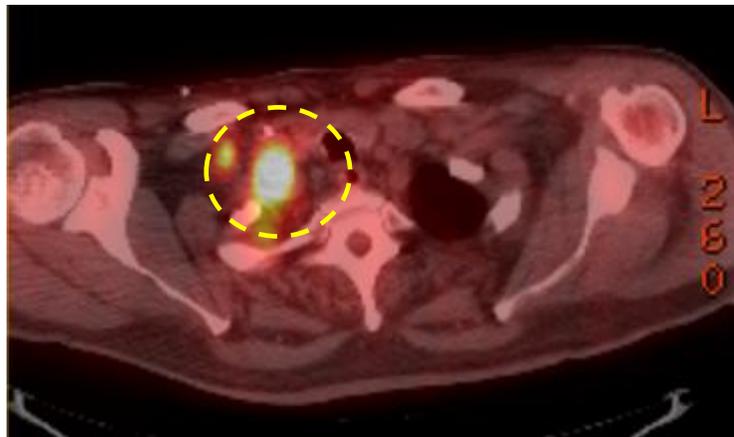
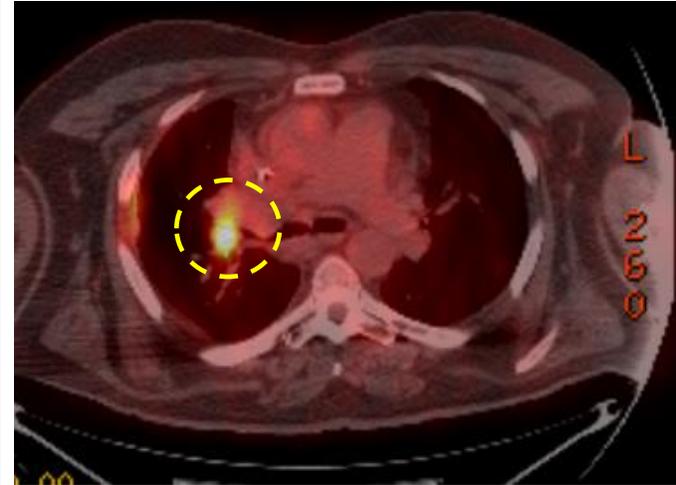
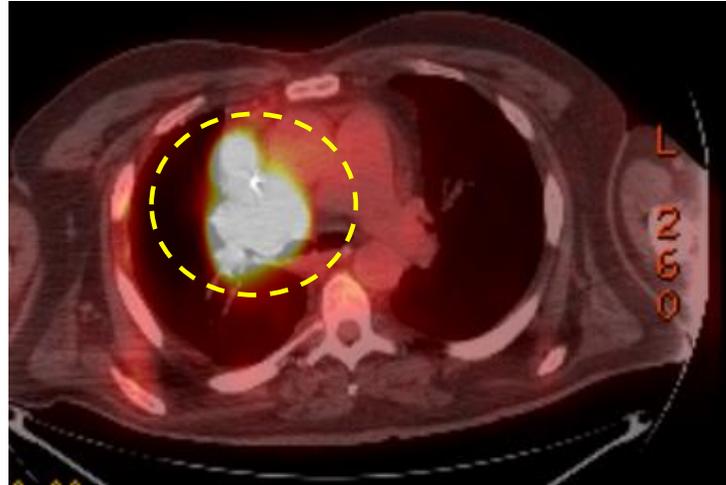
# Patient Case: Lung Cancer

- 56 year old man with metastatic lung cancer
- Progressed through standard chemotherapy
- Genomic analysis: BRAF gene mutation

# Patient Case: Precision Lung Cancer Treatment

Before

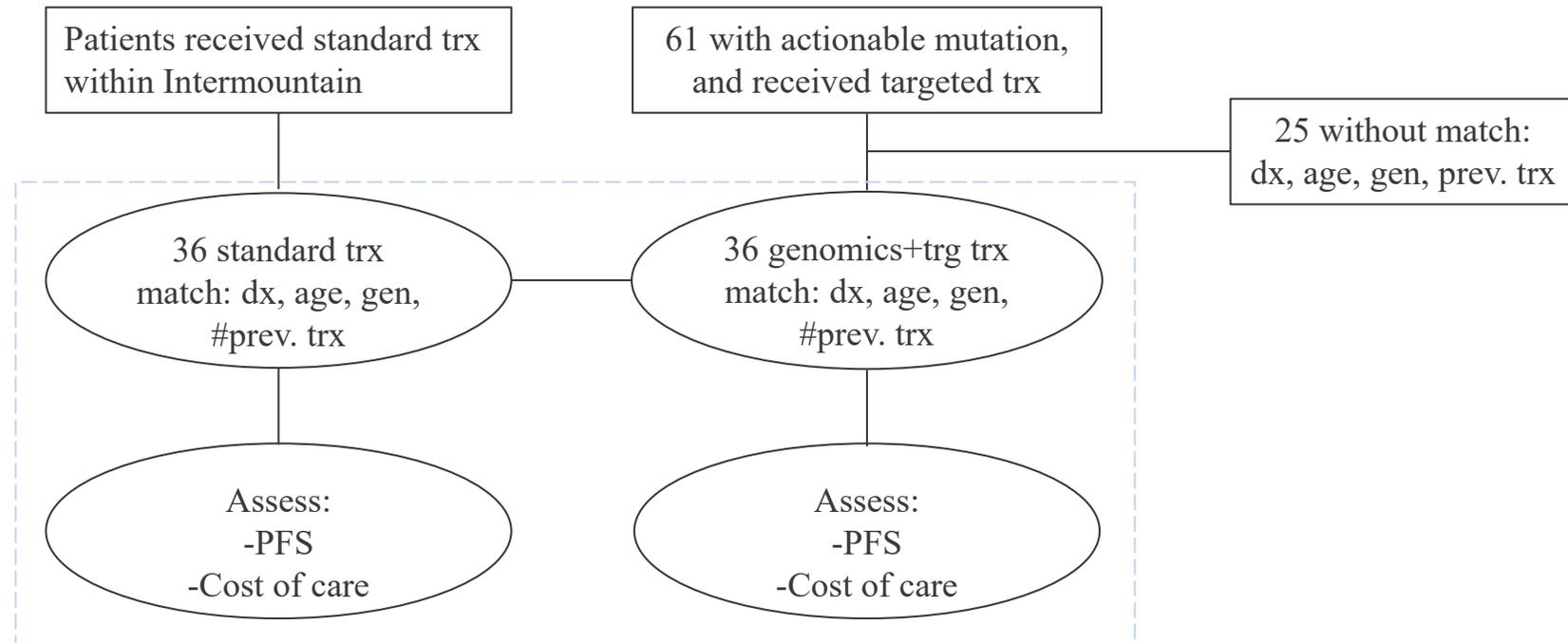
After



# Intermountain Precision Cancer Cohort Study



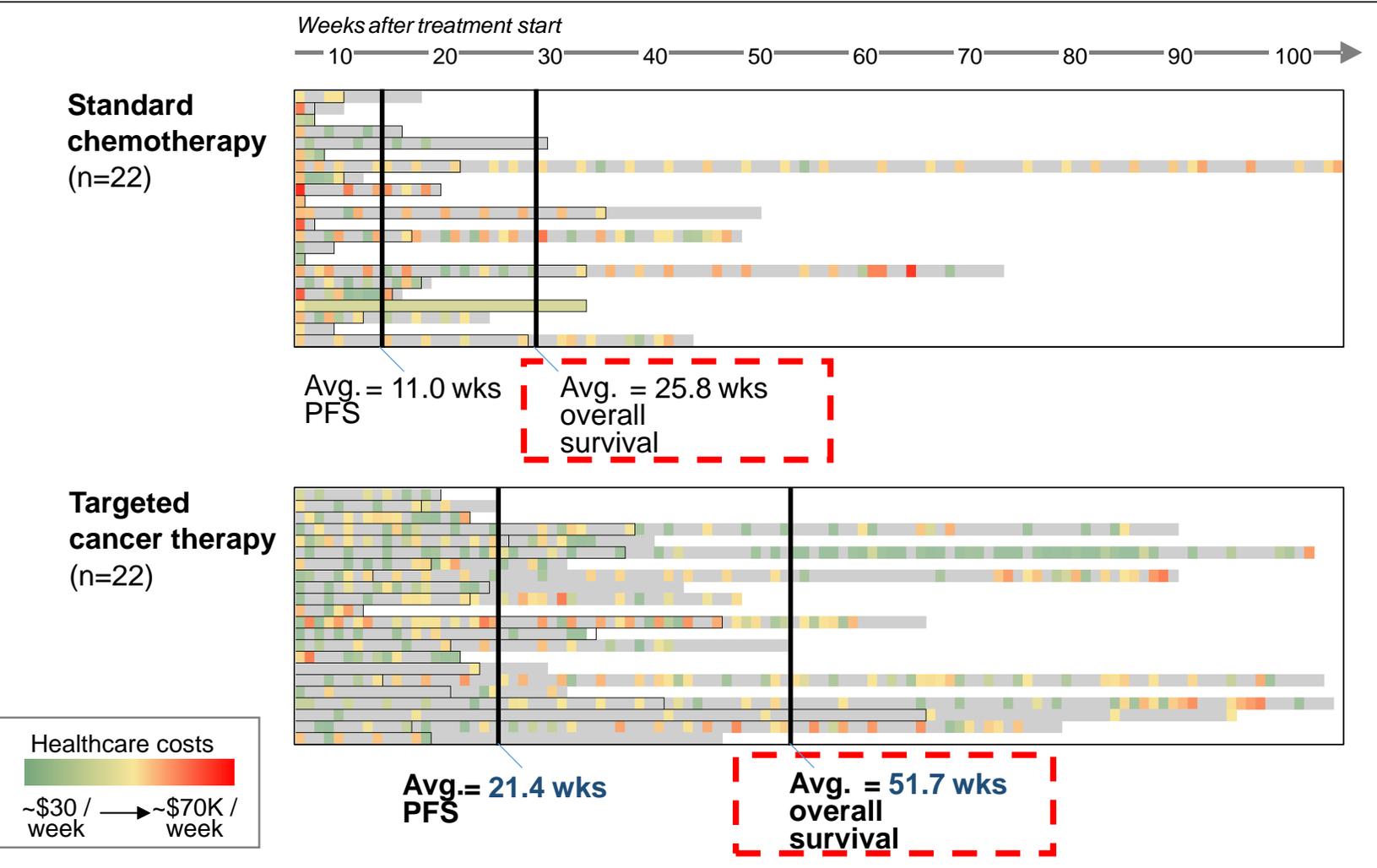
Oncology



# Precision Oncology: Overall Survival



Oncology



Haslem et al., Oncotarget. 2018

# Precision Oncology Costs



Oncology

	Control (N=22)	Targeted (N=22)	Difference
Inpatient	\$552	\$448	(\$104)
Outpatient	\$2,376	\$1,167	(\$1,209)
ER	\$34	\$45	\$11
Rx drugs	\$346	\$940	\$594
Hospice	\$146	\$9	(\$137)
Sequencing	\$0	\$112	\$112
<b>Total/week</b>	<b>\$3,453</b>	<b>\$2,720</b>	<b>\$734</b>

# Genomic Testing now covered by health plan



MEDICAL POLICY

## GENETIC TESTING: MOLECULAR PROFILING FOR DETERMINING THERAPY OF MALIGNANT TUMORS

Policy # 570

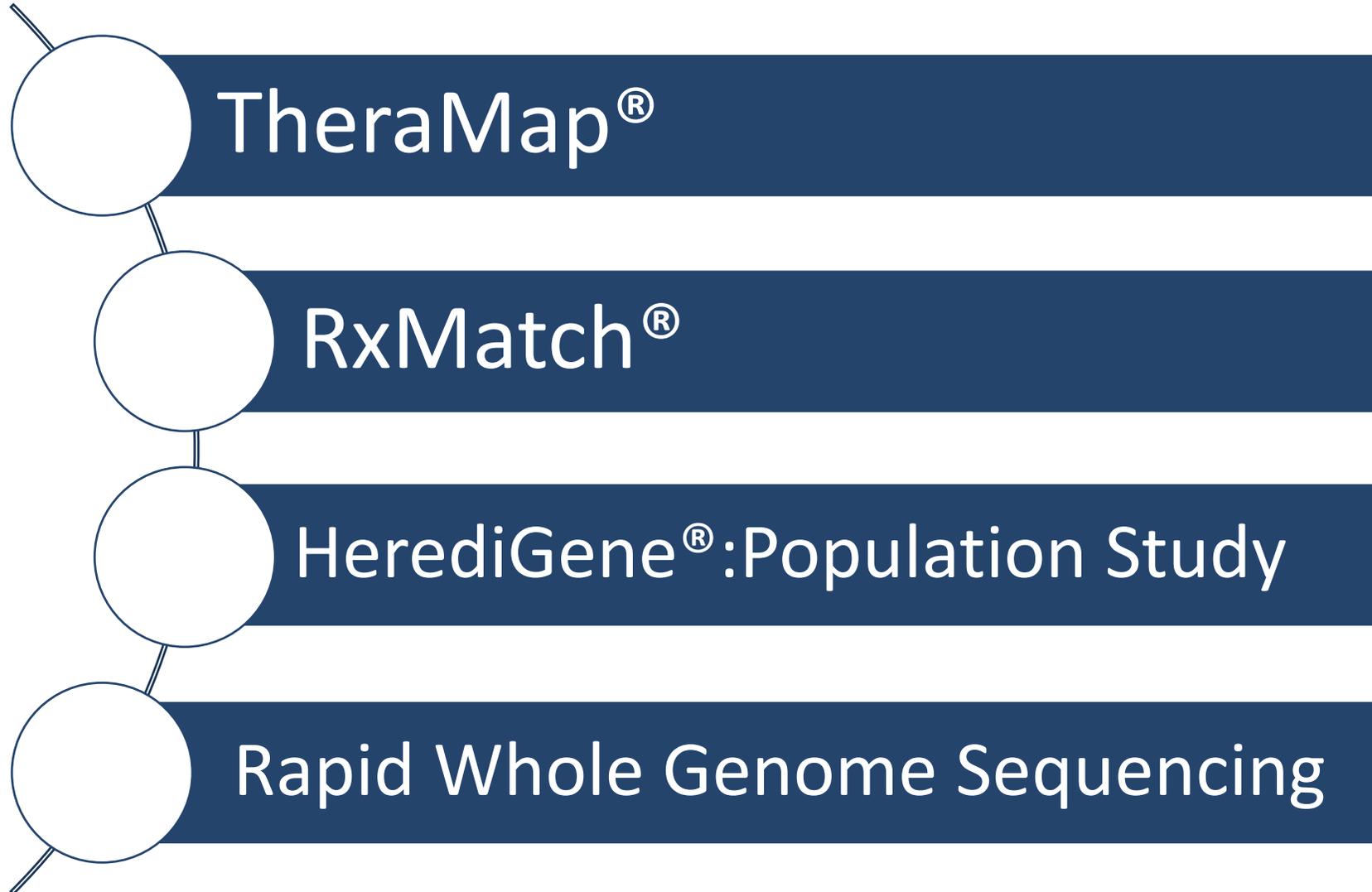
### Commercial Plan Policy

SelectHealth covers multi-marker tumor panels using next generation sequencing in the diagnosis and treatment of cancer as a method to guide the selection of therapeutic agents for malignant tumors in *limited circumstances*.

Patients must meet ALL of the following to be eligible for next-generation sequencing:

1. The member has one of the following clinic circumstances.
  - a. Any advanced stage IV solid tumors;
  - b. All lymphomas;
  - c. Multiple myeloma.
2. Patient has demonstrated progression of disease despite at least 1 lines of FDA approved and NCCN approved standard cancer therapy,

# Precision Health Products



\*All orderable and reportable within the EMR (Cerner)\*

# Anxiety and Depression: RxMatch<sup>®</sup>



Behav  
Med



Primary  
Care

For patients with newly diagnosed depression or anxiety



# Precision Neonatology: Rapid Whole Genome Sequencing



W & N

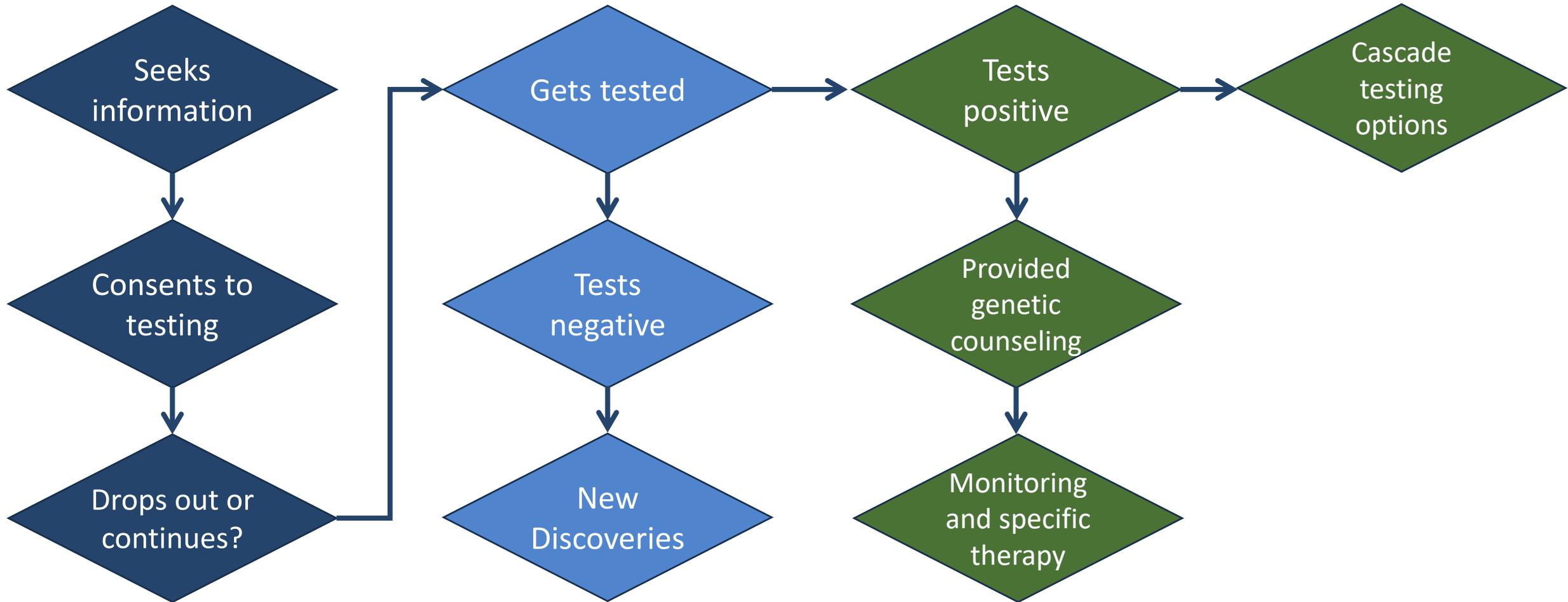


# Patient Case: Colon Cancer Screening and Prevention

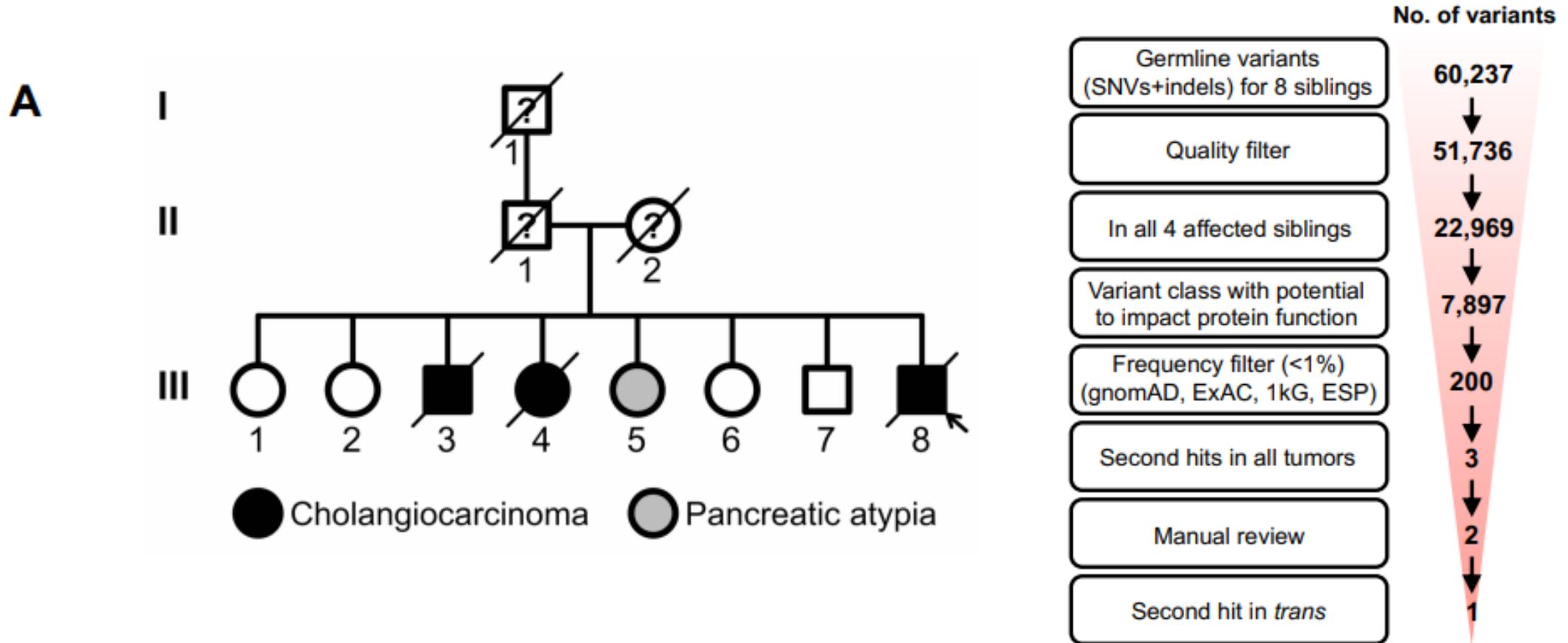
- 68 year old man with stage III colon cancer
- Patient was adopted
- He, therefore, had unknown family history of cancer
- DNA sequencing revealed germline MSH6 mutation
- Lynch Syndrome Diagnosis
  
- 2 children, 5 grandchildren
- prevention



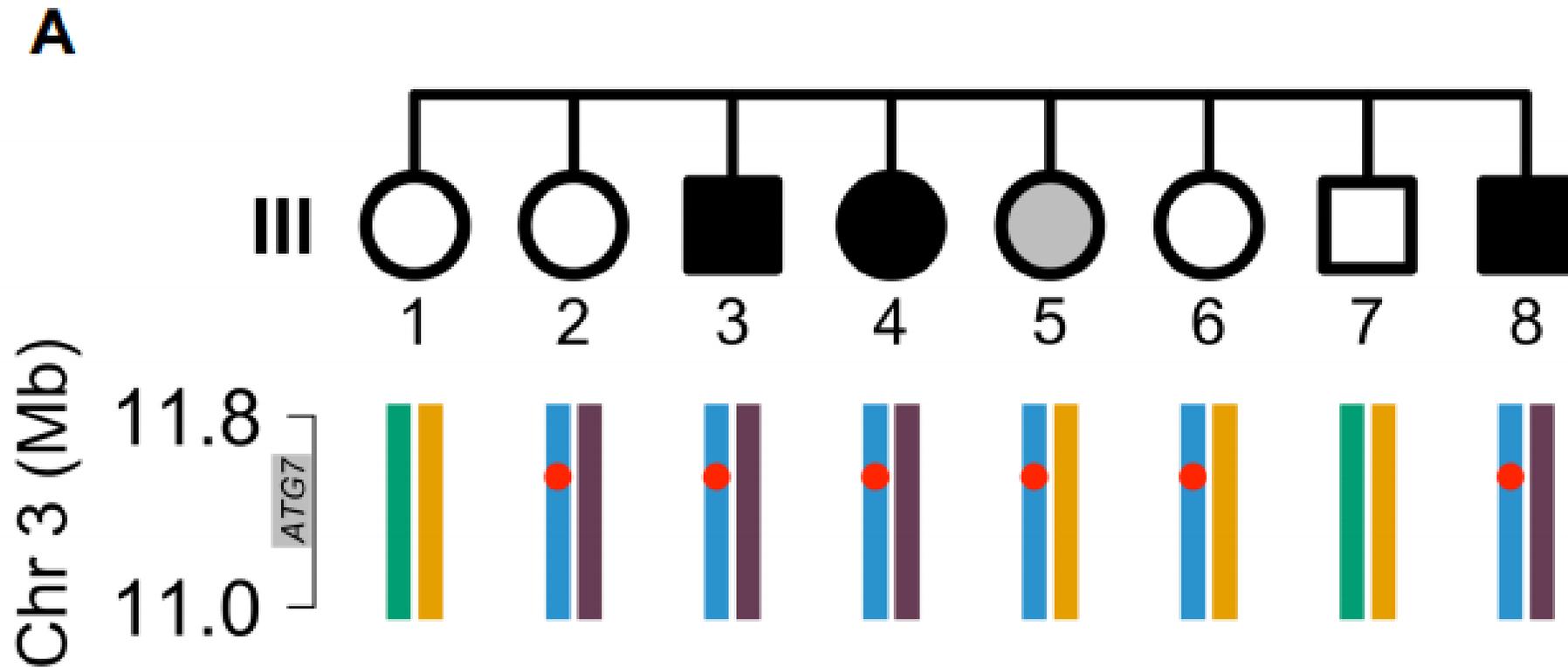
# How the Process Works



# New Inherited Cancer Gene Discovered



# New Cancer Gene Discovered



# An Altruistic Initiative

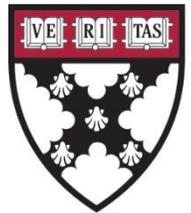
Legacy

Discovery

Acceleration



# Leading the Way in Precision Medicine



**HARVARD  
BUSINESS SCHOOL**



**Stanford  
MEDICINE**

# QUESTIONS?

