



Continuing Education Information

AIA -

- Have your conference badge scanned by the room monitor at the start of each session you attend.
- Complete the AIA verification form (be sure to check off the sessions you attend) and retain it for your records. CE credits will be uploaded to the AIA transcript system within 6-8 weeks of the close of the conference.

IDCEC -

- Have your IDCEC verification form STAMPED by the room monitor at the start of each session you attend. This is the ONLY proof of attendance that will be accepted.
- You will self-submit your credits to the IDCEC system at the conclusion of the conference.
- If you have questions about reporting your credits, contact the interior design association that is responsible for monitoring mandatory continuing education to fulfill membership requirements.

EDAC -

- Complete the EDAC verification form and retain it for your records
- You will self-submit your CE credits to Castle Worldwide at the time of your EDAC renewal. Renewal notices with login instructions will be sent from Castle Worldwide six months and three months prior to the candidate's renewal date.
- The verification form is your proof of attendance in case of an audit.

- **Session Evaluation – HCD Mobile App**
- All session evaluations will be done through the new HCD Mobile App.
- If you have not done so already please download the app through your device's app store. If you have any questions or need assistance please visit the help desk.
- **Individual Session Evaluation Instructions –**
 - On the home screen, click Show Schedule
 - Find the session you are attending
 - After selecting an individual session, a navigation bar will appear on the left. Click the clipboard icon and evaluation/survey will begin.

Get Social!

Send us a tweet (@HCDcon) and use #HCDcon, or a comment on Facebook (www.facebook.com/HealthcareDesignMag) and tell us something you've learned or a unique product you've seen at this year's Healthcare Design Expo & Conference.



The Emergence of Genomics and its Impact on Healthcare Delivery

HCD Session E67

Introductions



John Scoggin, AIA

27+ years – research and medical spaces for major healthcare institutions



Janet Corzo, AIA, LEED AP BD+C

13+ years – clinical and research labs for major institutional and corporate clients



Luke Thiboutot, AIA

23+ years - Life Science and Healthcare design and planning

100%
HEALTHCARE

OVER
8,000
PROJECTS

AWARD WINNING
DESIGN

400+
CLIENTS

STATES
44



8
STRATEGIC
OFFICES

DESIGN PROFESSIONALS
 170

COMMUNICATION

STATE-OF-THE-ART TECHNOLOGY FOR PROJECT MANAGEMENT,
BUILDING INFORMATION MODELING & VIRTUAL REALITY

COLLABORATION

E4H SMARTDESIGN SOFTWARE FOR
REAL-TIME DESIGN END-USER MEETINGS

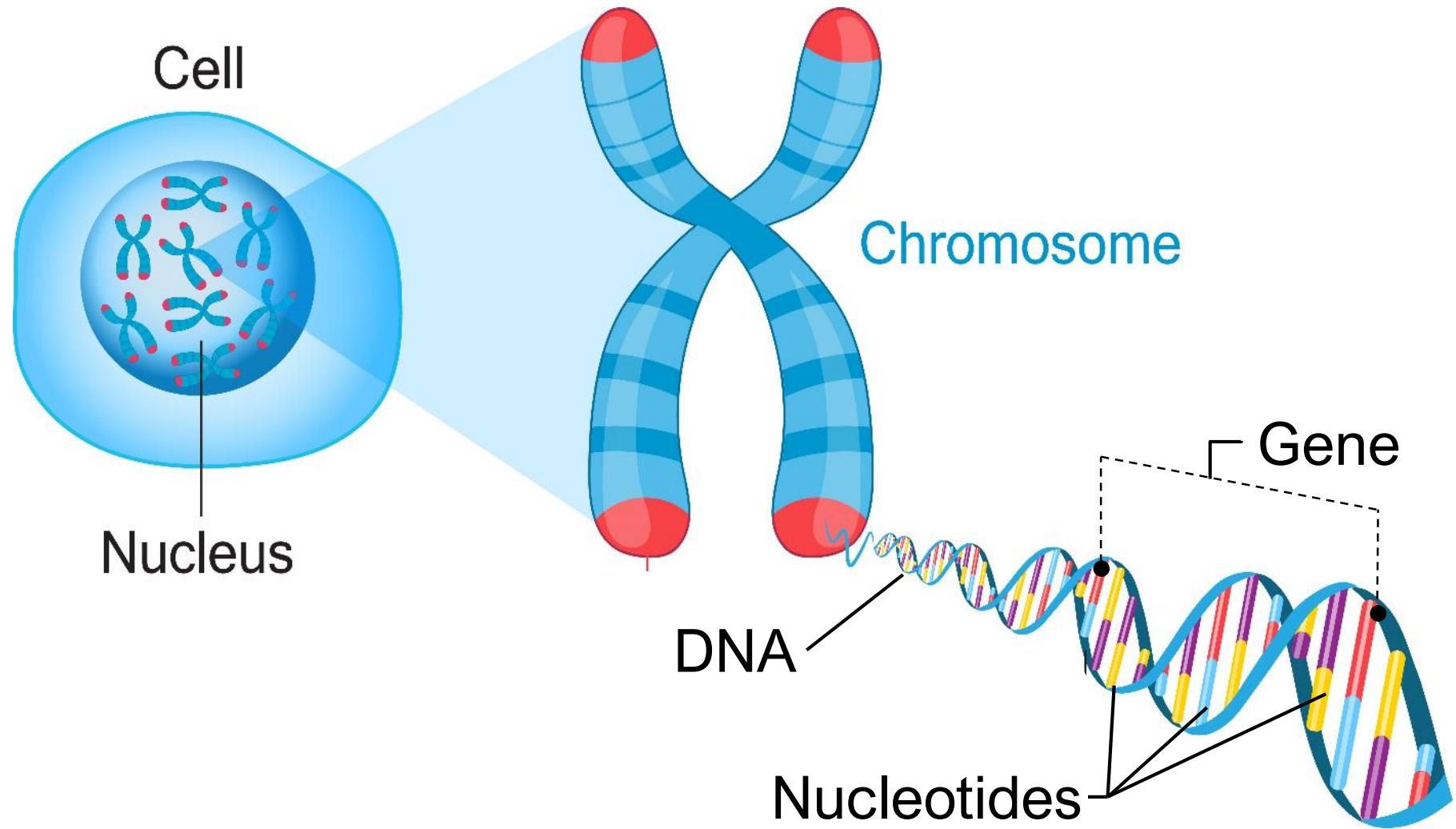
Agenda

- Milestones in Genomics
- Genomics in Disease Diagnosis and Treatment
- Understanding Current Lab Design
- Translational Medicine
- Case Study – SGF
- Q&A

Milestones in the Genomics Revolution



Definitions



Gene Sequencing

DNA Sequencing is the process of determining the accurate order of nucleotides along chromosomes and genomes.

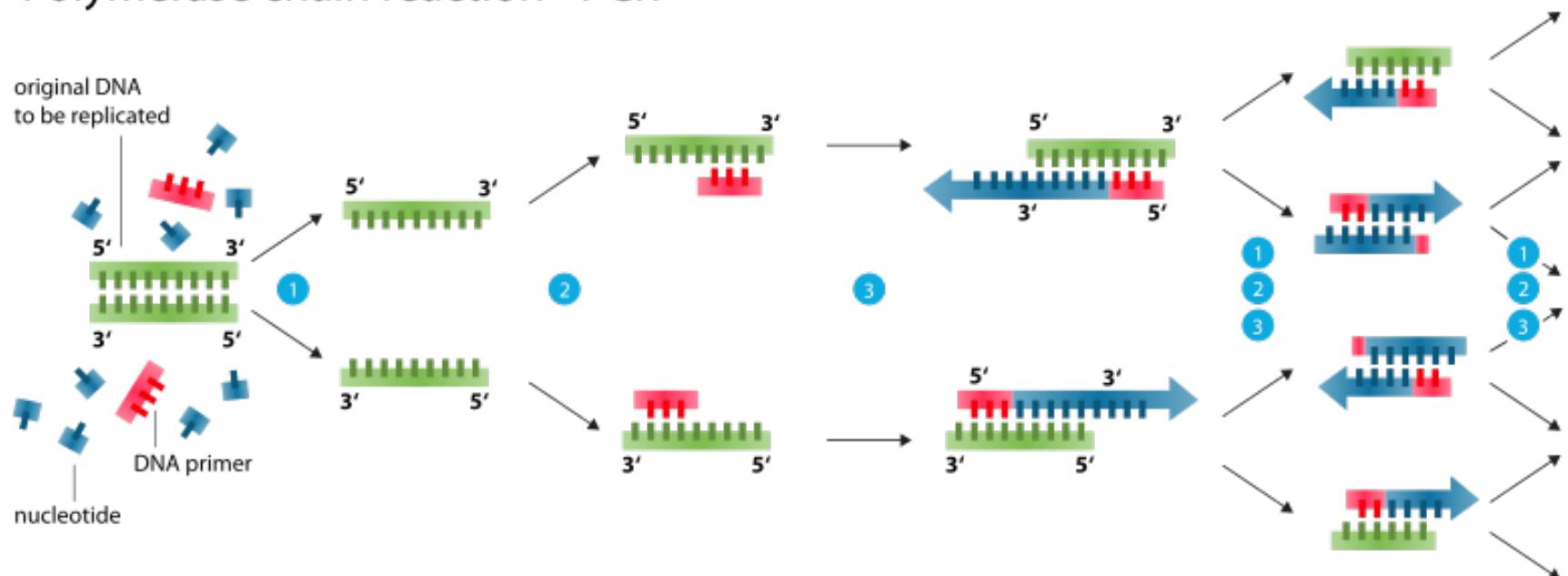
The **Human Genome Project** (HGP) was an international scientific research project with the goal of determining the sequence of nucleotide base pairs that make up human DNA.

- Blueprint for building human life
- Open Source
- Duration: 1990 to 2003 - **13 Years**
- Duration: 2018 - **24 Hours**
- Cost: **\$2.7 Billion**
- Cost: 2019 < **\$200**



Gene Replication

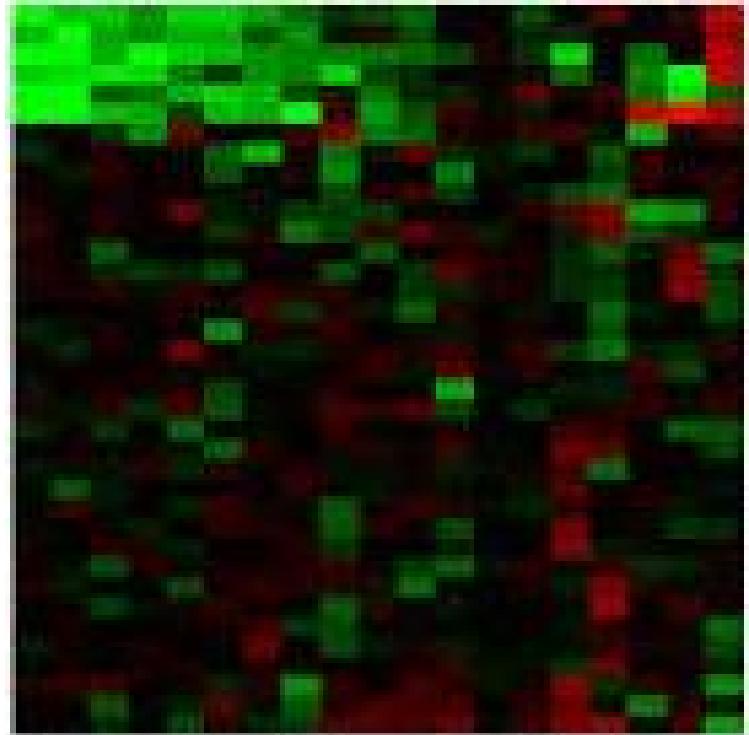
Polymerase chain reaction - PCR



- 1 **Denaturation** at 94-96°C
- 2 **Annealing** at ~68°C
- 3 **Elongation** at ca. 72 °C

Gene Expression

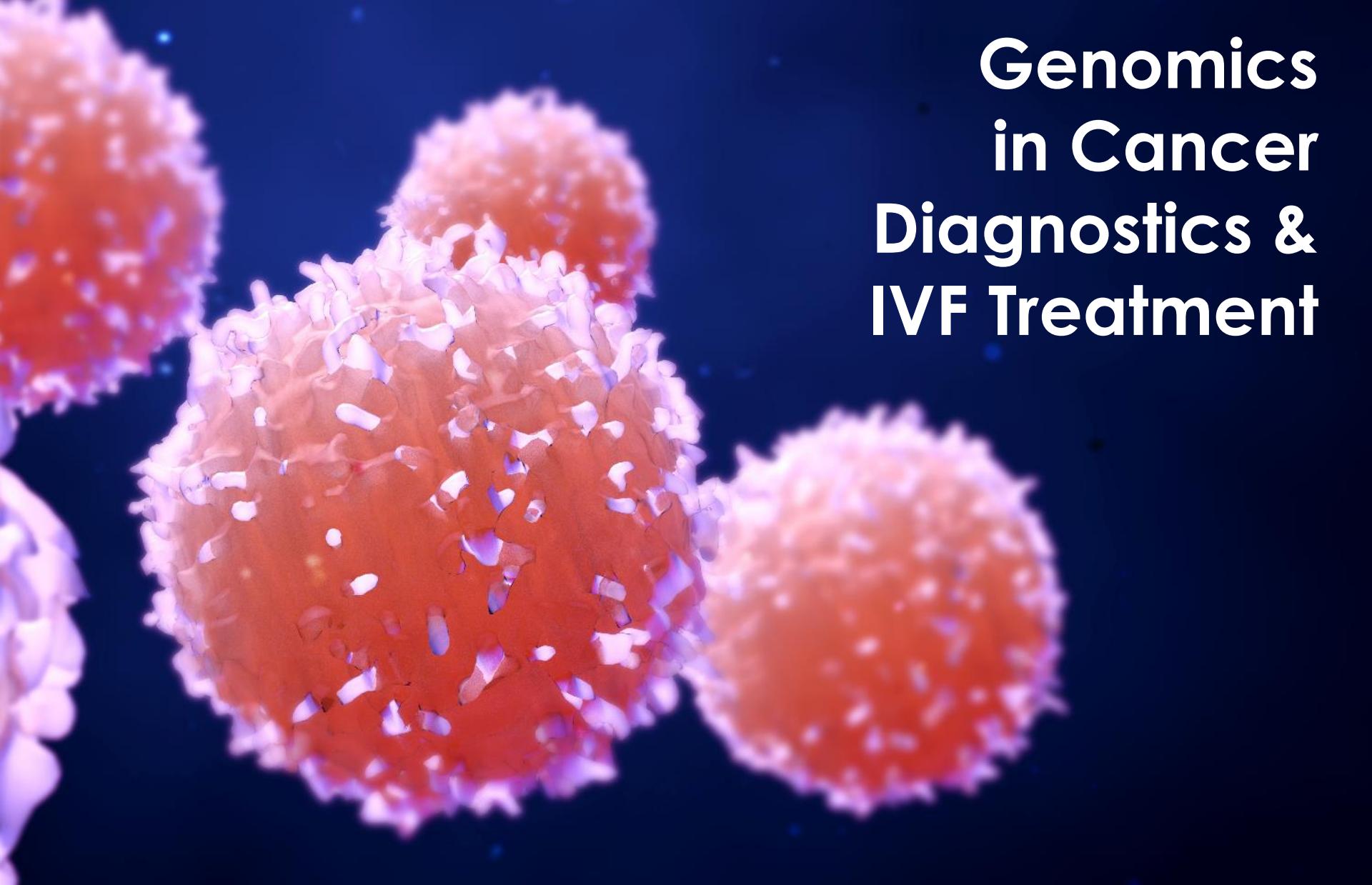
Gene Expression Profiling is the measurement of the activity (the expression) of thousands of genes at once, to create a global picture of cellular function.



Gene Editing

Gene Editing is the process of modifying DNA by adding, removing or altering nucleotides in the genome.



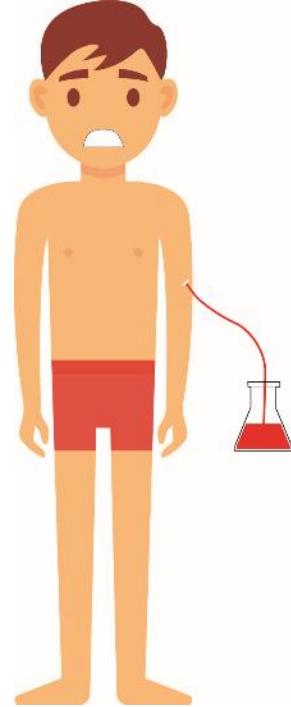


Genomics in Cancer Diagnostics & IVF Treatment

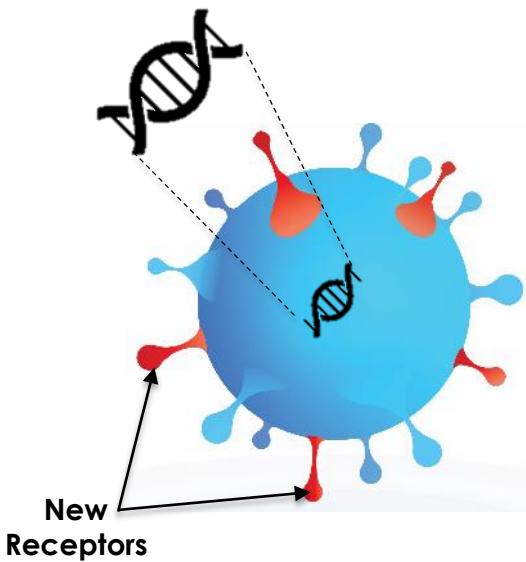
CAR T Cell Therapy

Treatment in which a patient's T cells (a type of immune system cell) are genetically modified in the laboratory so they will attack specific cancer cells.

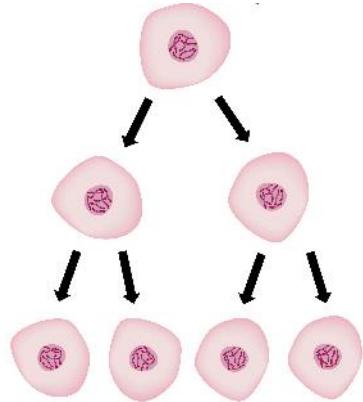
**T cells
collected
from Patient**



**T cells genetically
engineered to create
new receptor**

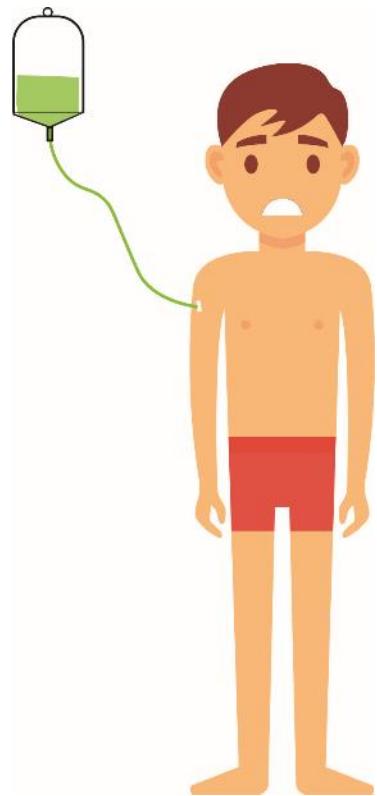


**Modified T cells
“expanded” by
growing cells in the lab.**

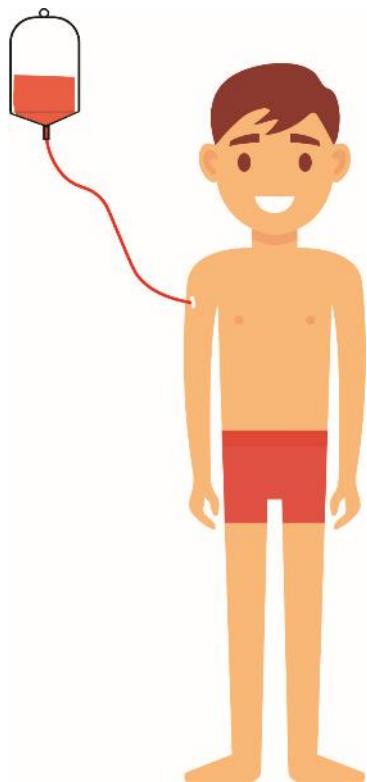


CAR T Cell Therapy

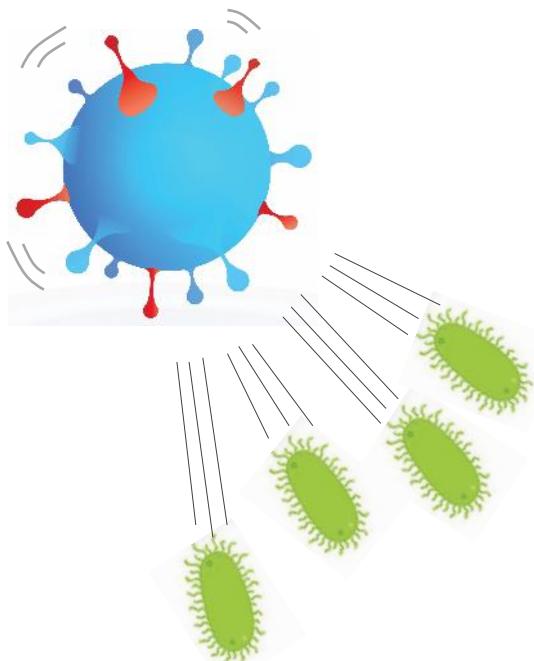
Patient receives
chemo therapy



Patient receives
infusion on modified
T cells



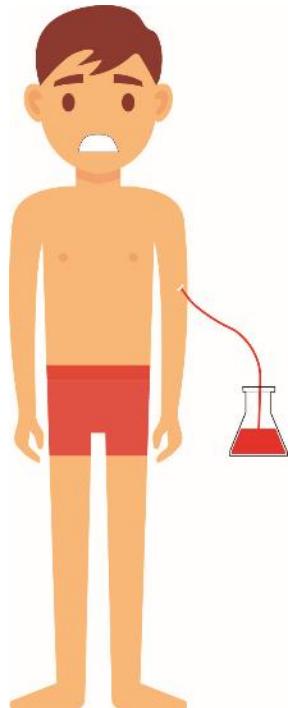
Modified T cells now
recognize and attack
cancers cells



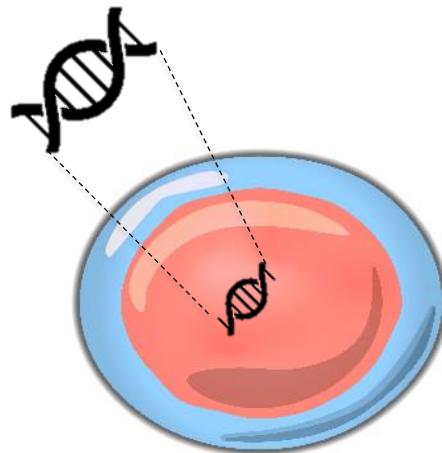
Genetically Modified Stem Cell Therapy

Treatment in which a patient's stem cells are modified to correct mutations within the cells.

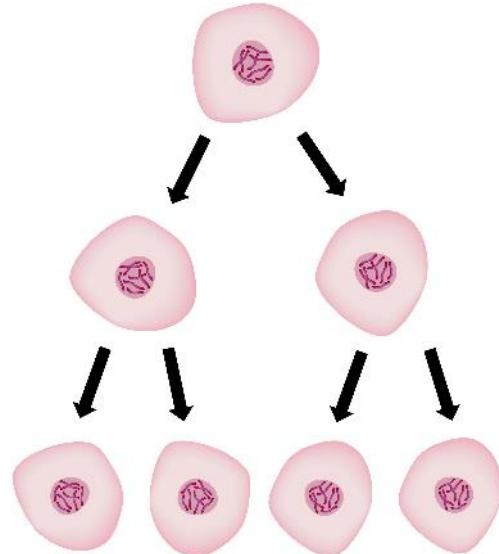
Stem cells are retrieved from patient's bone marrow.



DNA added to genetically correct stem cell mutation

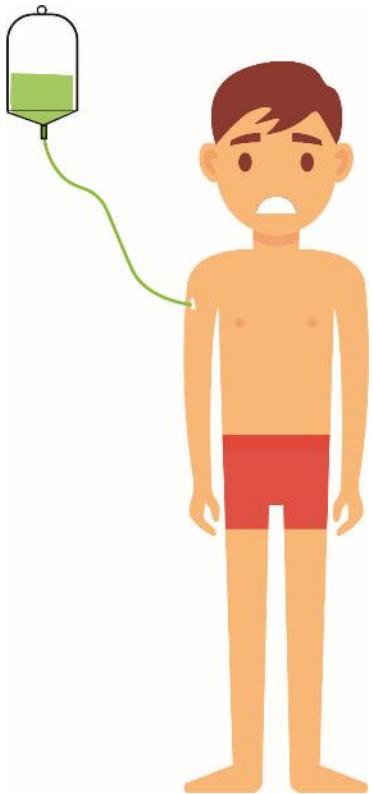


Modified stem cells “expanded” by growing cells in the lab

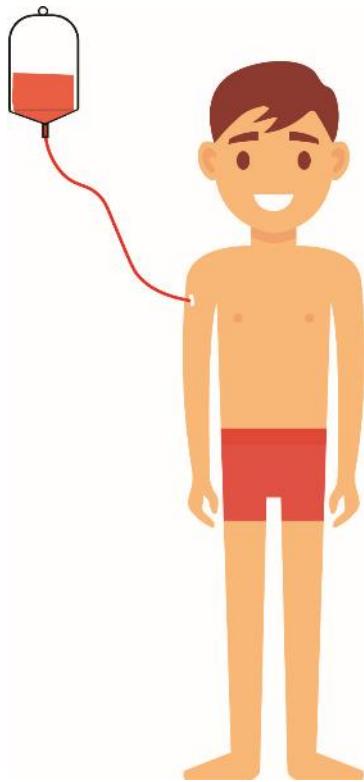


Genetically Modified Stem Cell Therapy

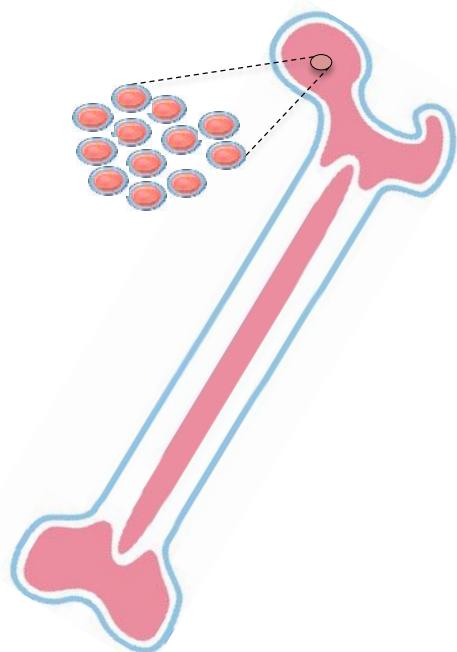
Patient receives
chemo therapy



Patient receives
infusion of modified
stem cells

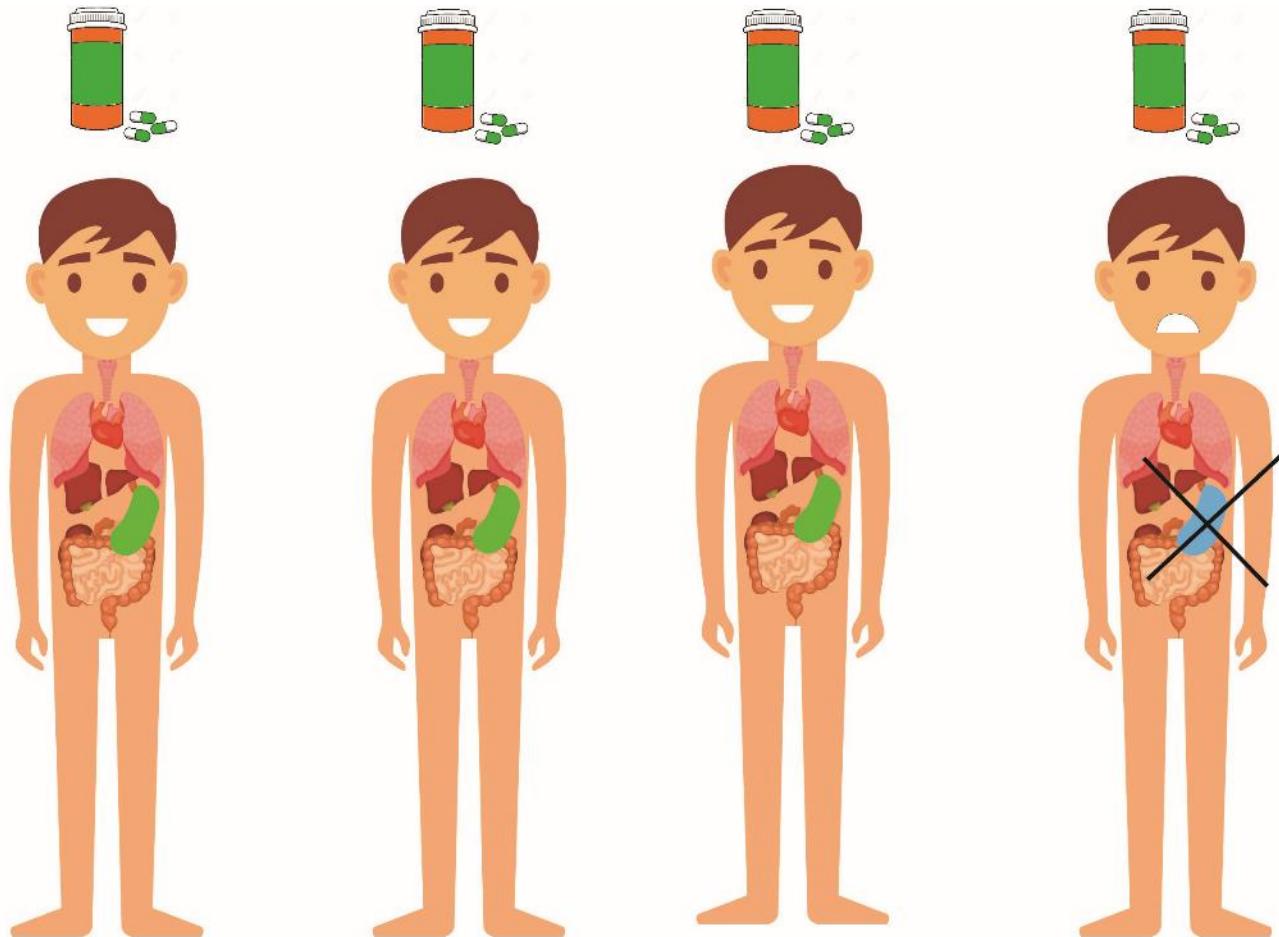


Stem cells travels to bone
marrow and produce new
healthy blood



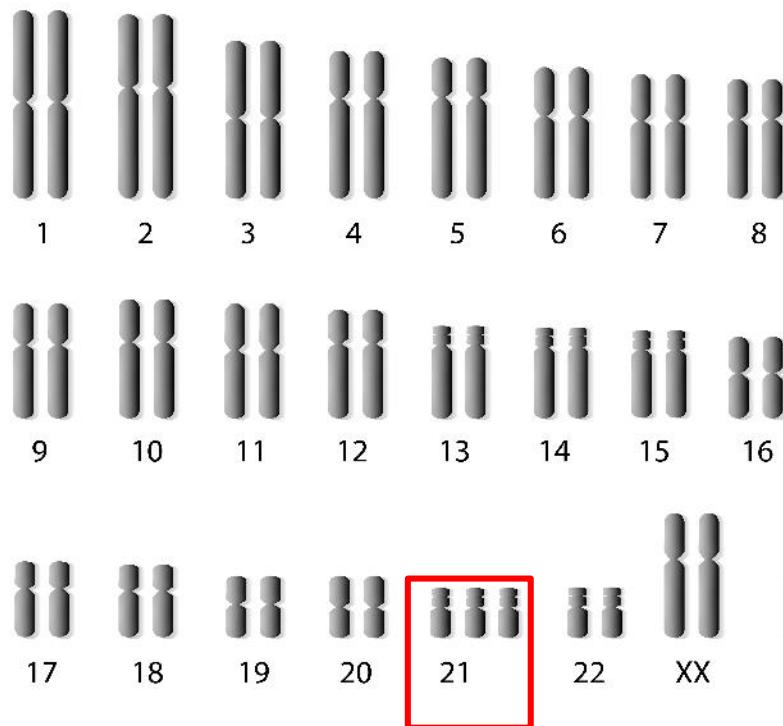
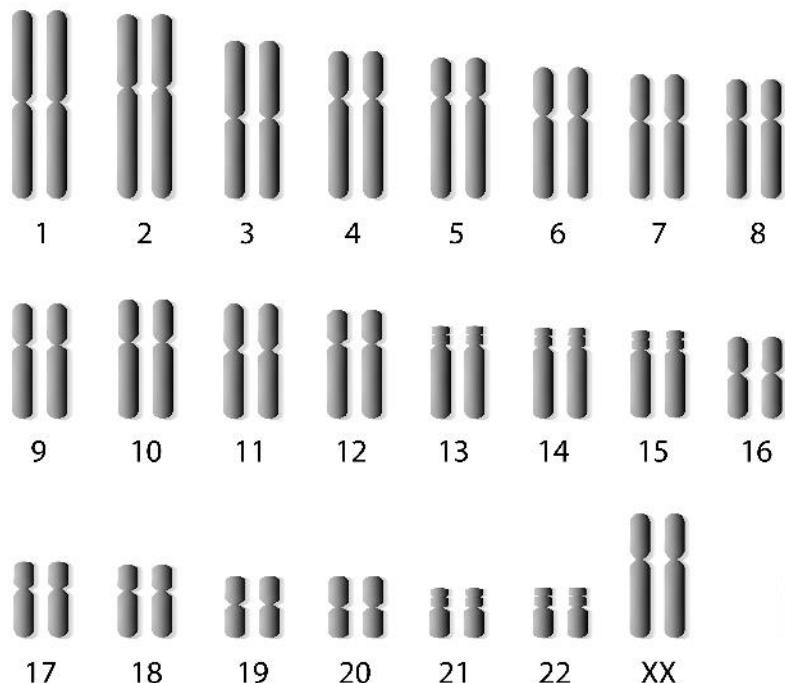
Pharmacogenomics

The study of how genes affect a person's response to drugs



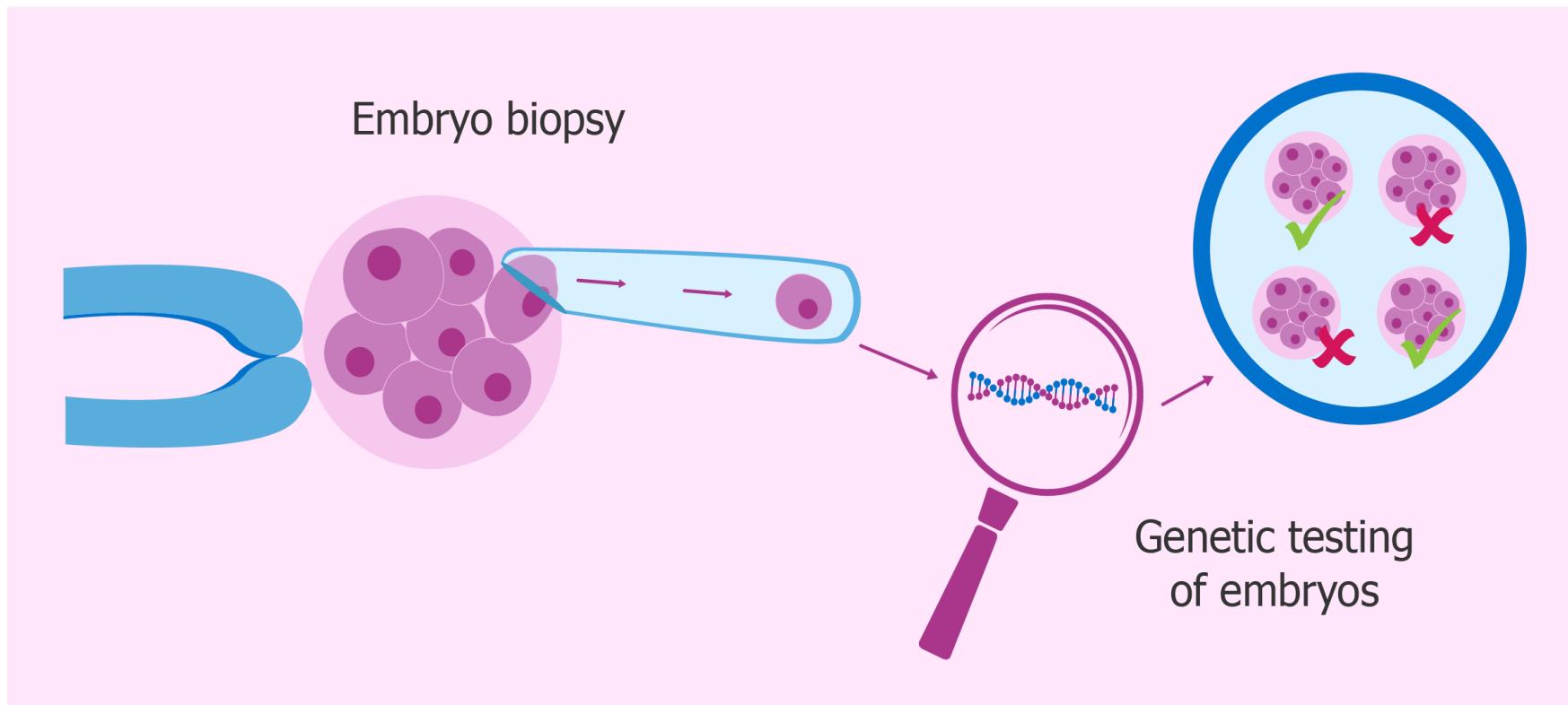
Pre-implantation Genetic Screening (PGS)

The screening of embryonic cells for additional chromosomes which are a leading cause of miscarriage and implantation failure.



Pre-implantation Genetic Diagnosis (PGD)

The screening of a single cells from embryos for genetic diseases and chromosomal disorders.



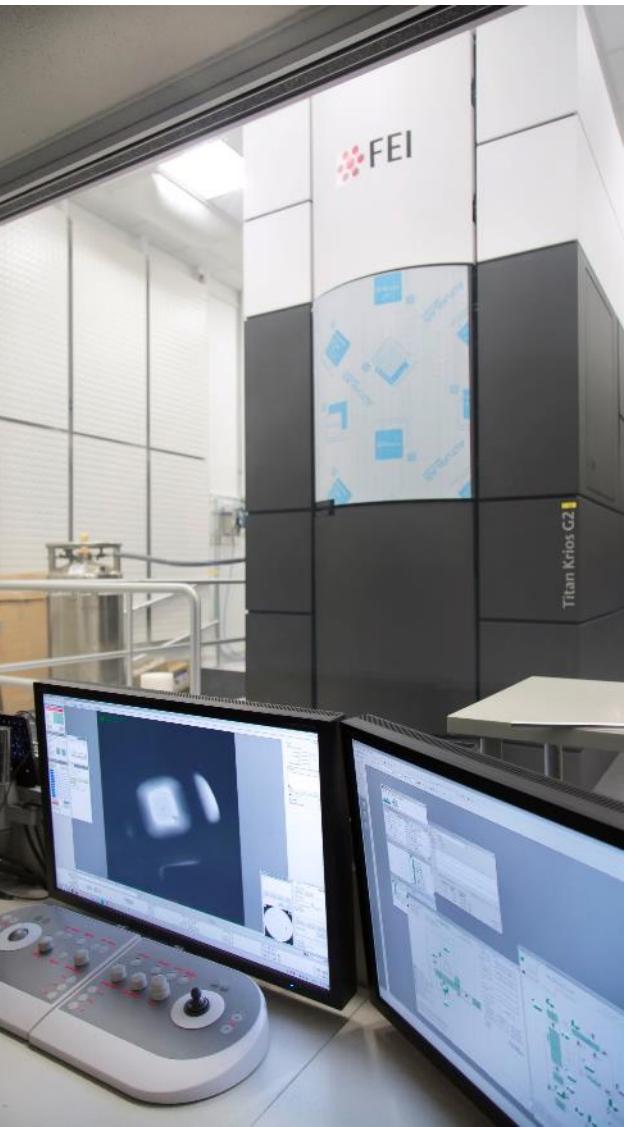


Current Laboratory Design & Translational Medicine

Hospital Laboratory Types



Medical Research Laboratory Types



Corzo project while at Hillier

Key Differences



CLINICAL

- Labs are mostly diagnostic
- LEAN principles
- Increasingly automated
- Throughput-driven
- Revenue generating

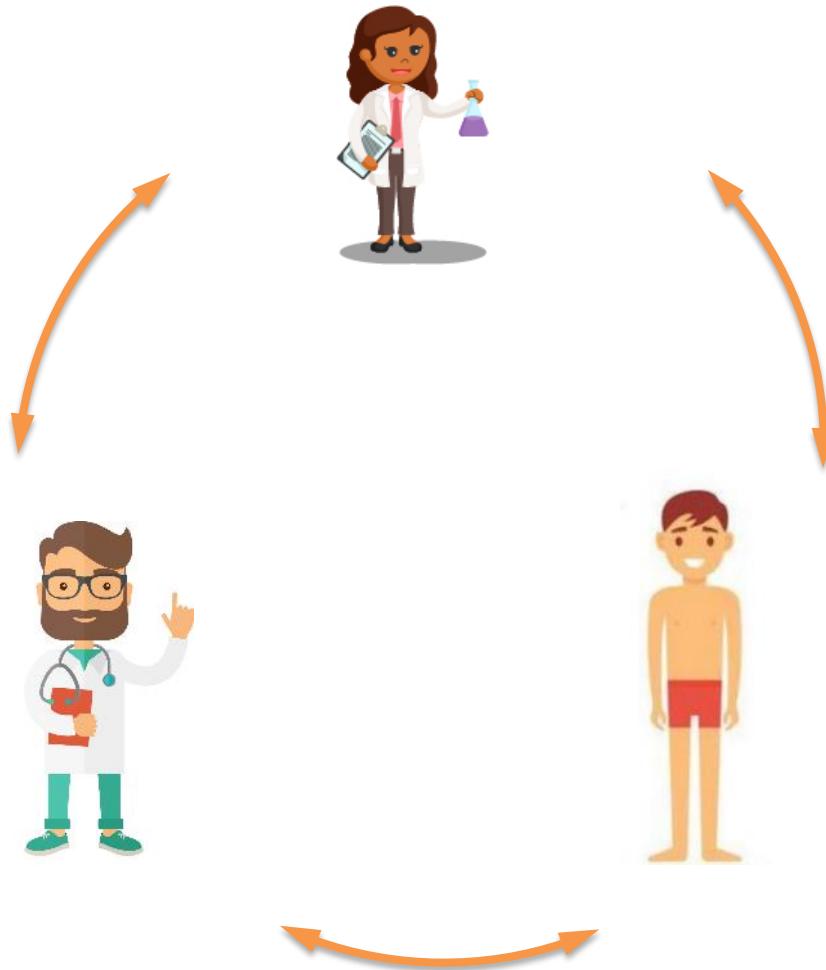
RESEARCH

- Open-ended work
- Broad range of work
- Teams of researchers led by PI
- Core facility model
- Increasing partnerships (pharma, equipment manufacturers, etc.)
- Grant-funded

Translational Medicine



Translational Medicine



Translational Medicine



In order for a cancer program to receive a ***Comprehensive Cancer Center*** designation from the NIH National Cancer Institute, it must demonstrate **“substantial transdisciplinary research”** that bridges basic laboratory, clinical, and prevention, control and population-based science. They also “integrate training and education of biomedical researchers and community health professionals.

Genomic Translational Revolution



ANALYSIS



EVIDENCE



CLINICAL STUDY



EFFECTIVENESS



MEDICATIONS



HEALTH

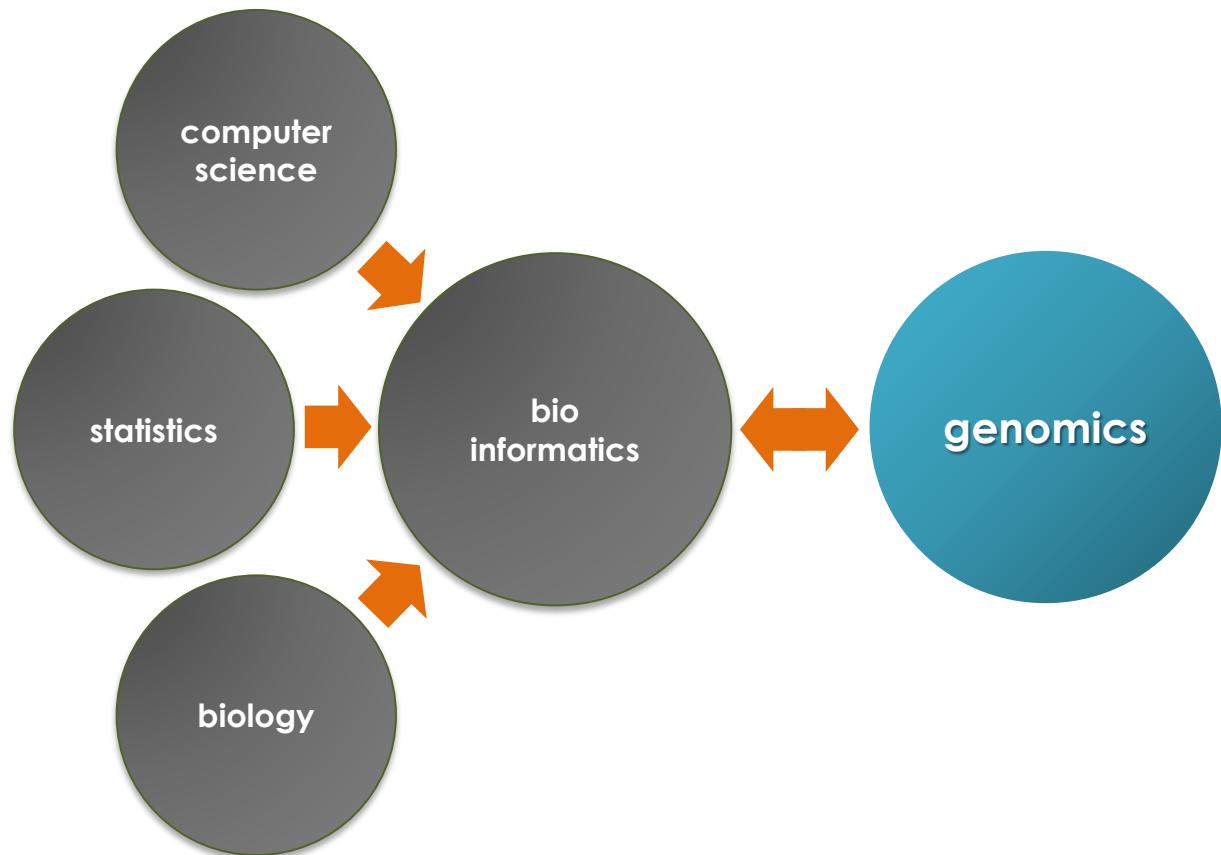


Genomics Research

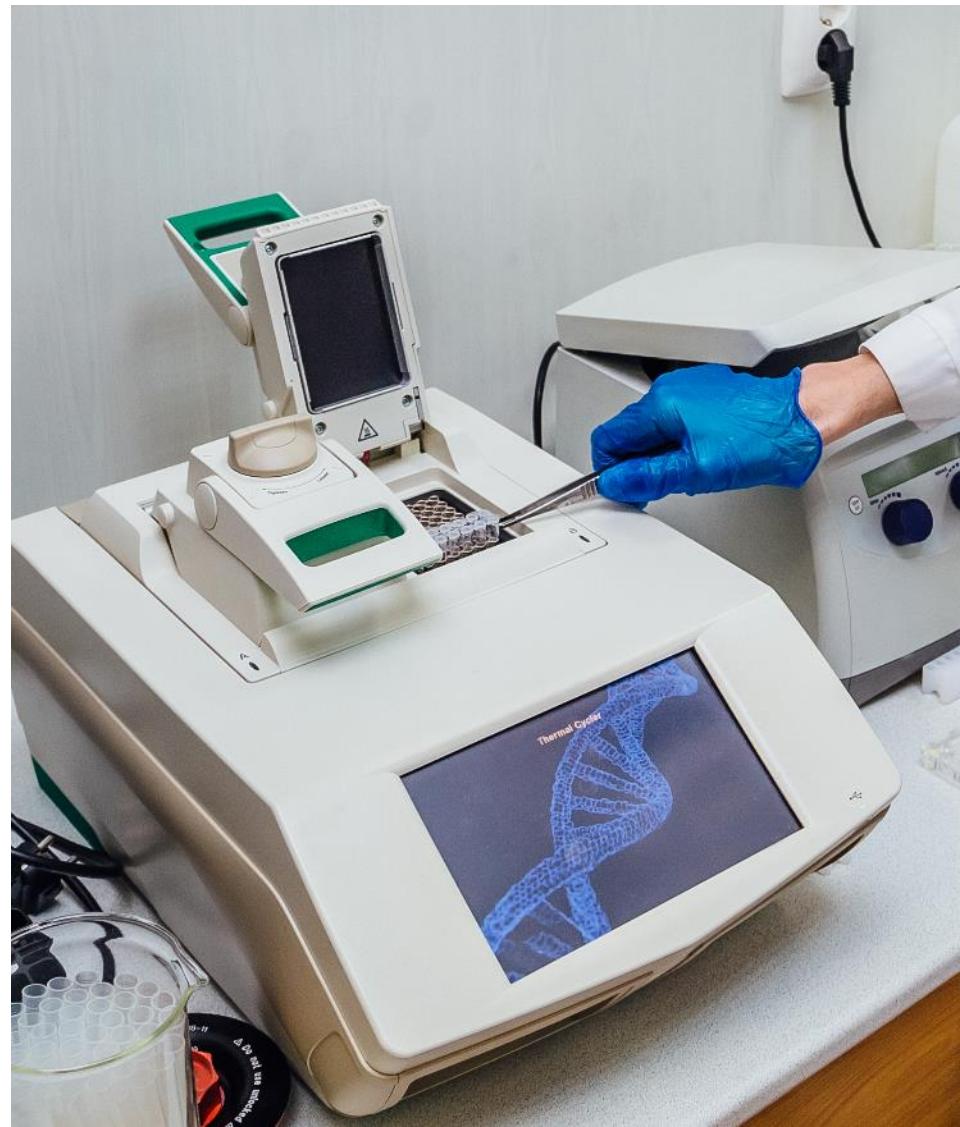
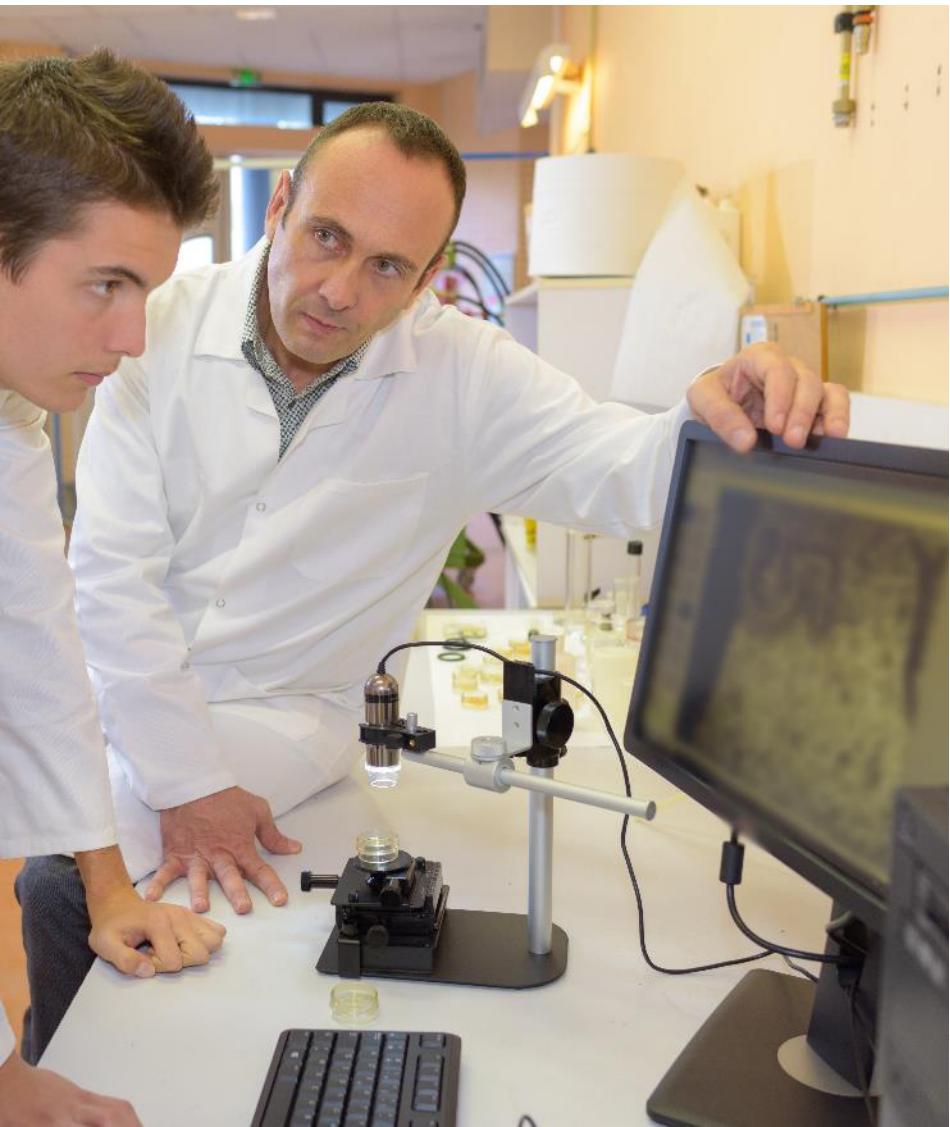


gagggtctaaagggagaccataacttgactcatttagagctagg
ccaagaaaaatagactgatgaagaaatatcagatatgacaa
caaagcagatagaagaagc aaaccattcacaatcagaca ATGA
TCACGTTTCTCACCTTATTGTTCAGgttcgtcttagtt
gaaacagAGTTTCAATTGGGACTCATGGAAGAAAAGGAGGA
CTTGGCTCCTCCTCTCAATCCGTTGCTCTGAAG gtt
tcattcctcagGTACTTACCGGGAAAGCTTACGATCTAAC
AAAGGAATAAAAGCTTGGCTGATATAGTGTAAACCACAGAA
ATGATCGTCTTGATTGGGATCTCCTTGTCTGCCGAATGA
CGACATCGACCACCTAACCTAGAGTCAGAAAAGAGTTGCC
GTTCGAGGTTATGCATCTTCATCACCAAATTATACGTTCAAG
ggtttagataattttactattactatataaagtatcatag
ataagaaatataaagaagttcactactgattatgtgataaa
GGGACGATATGAAGTACGGAGGAGACGGGAAACTAGACTATGA
GTTGACAGCTTTGATTTCACCACCAAAAGGGATCTTACAGTCT
ATAGGAATCATGCCCGGAAACGCTGTCACATTCTAGATAACC
ATATACTTACTCATCCAGGAACCTTGCATT gtaagtatcat
gcagTTTATAATCATTACATAGAATGGGACTAAAAGAGAGC
ACGATAAAAAGCGGCAGAGGGCGGATCTCTACTTGCTATGATTG
CTAATTGGCTTAGCTTATCAGGCCCTGACTTTGCTGTC
ccttttataaaaacatttggcagttatctaagatatgtata
gataacaactccagtgaaagaaaagagttcaagtgaaagatgt
taatattatattatattggccgactcgatataagatattggagccc
ttatattattgtatqaqaagaaaaaaaagttatggatggaaat

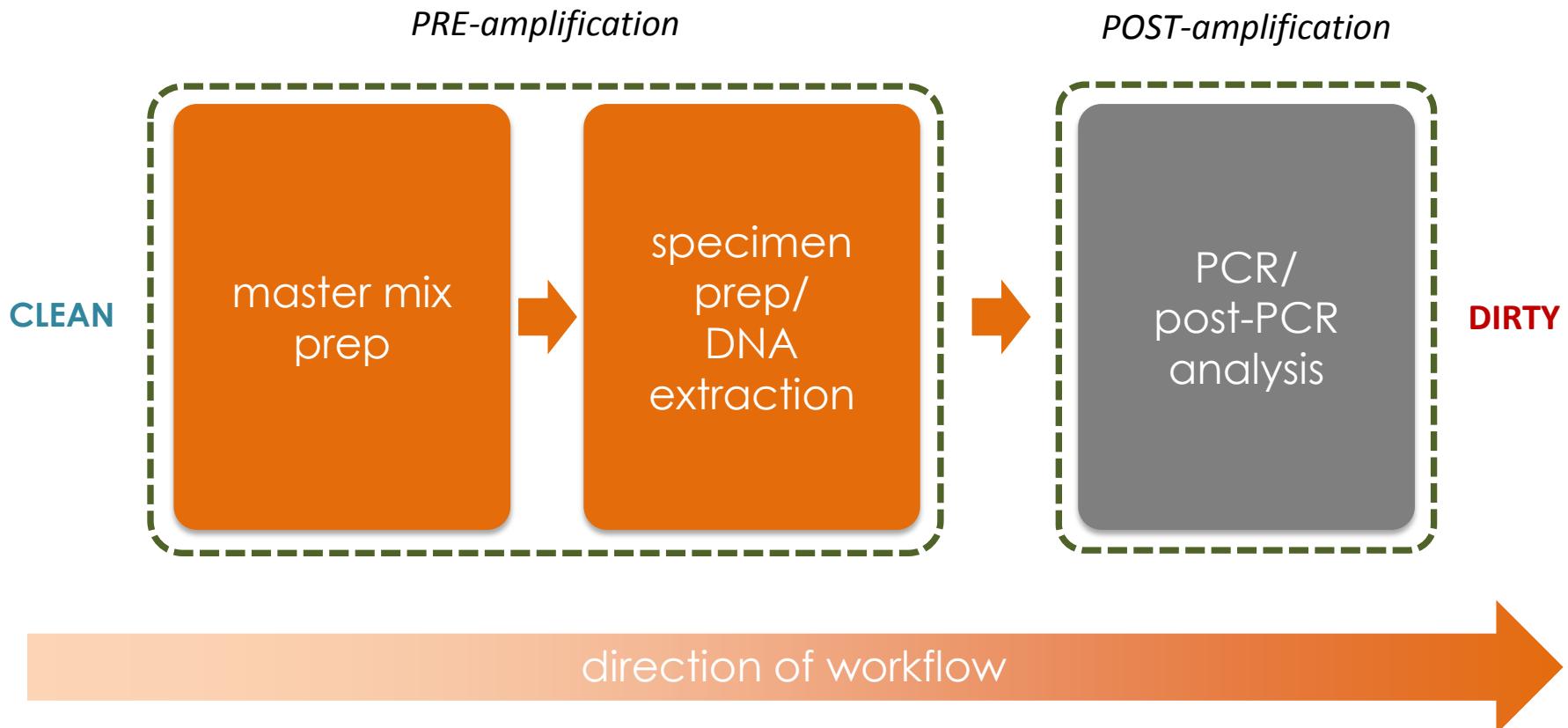
Genomics Research



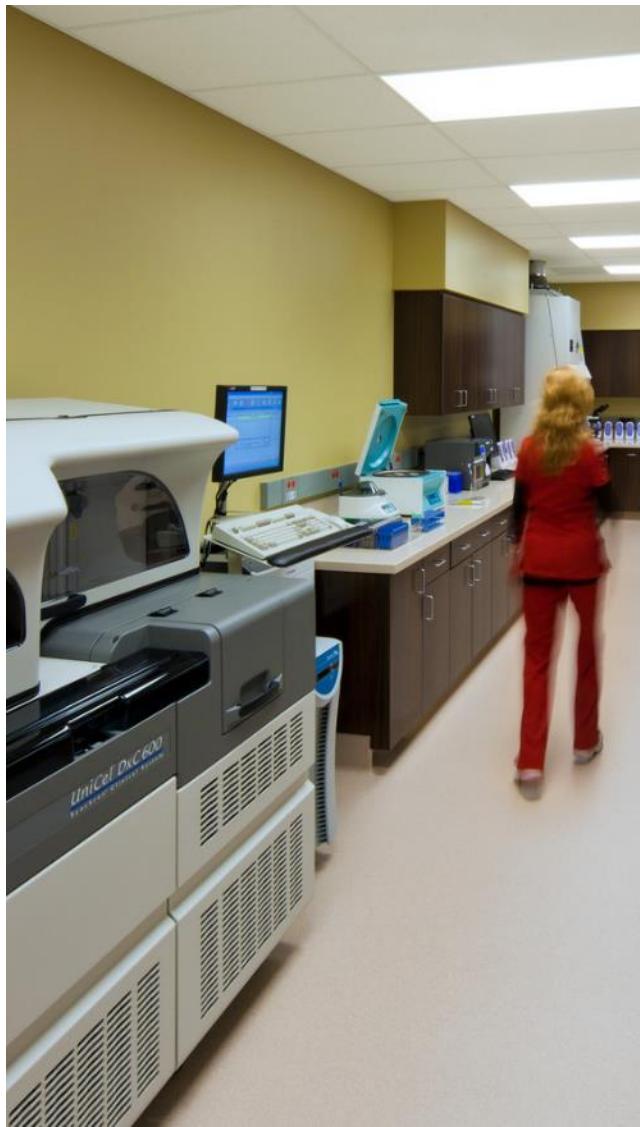
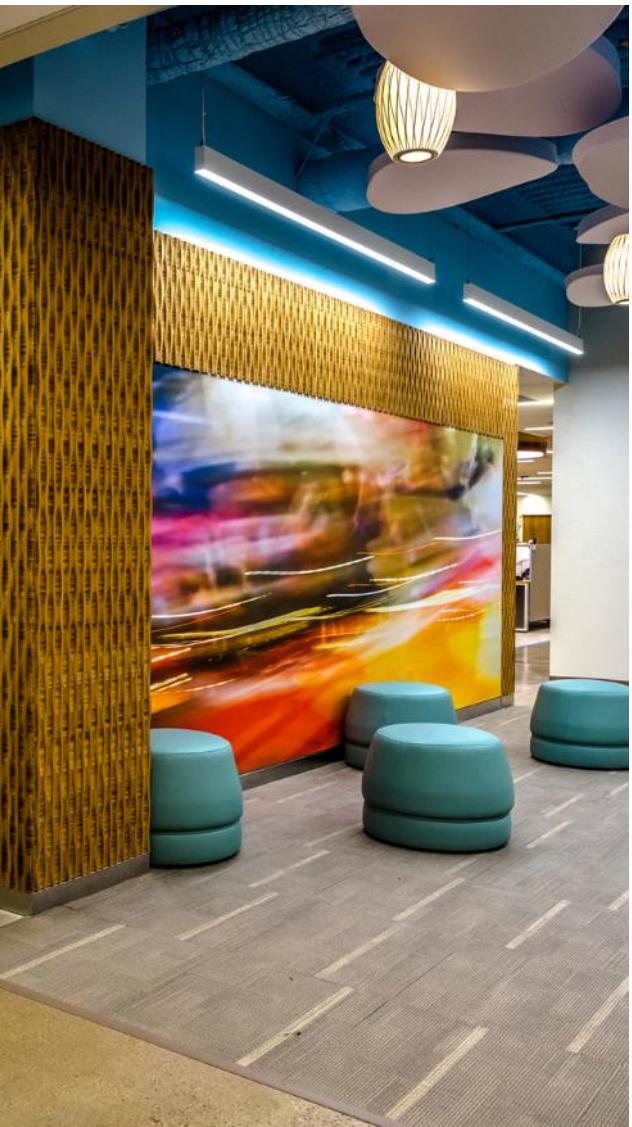
Clinical Genomics



Clinical Genomics

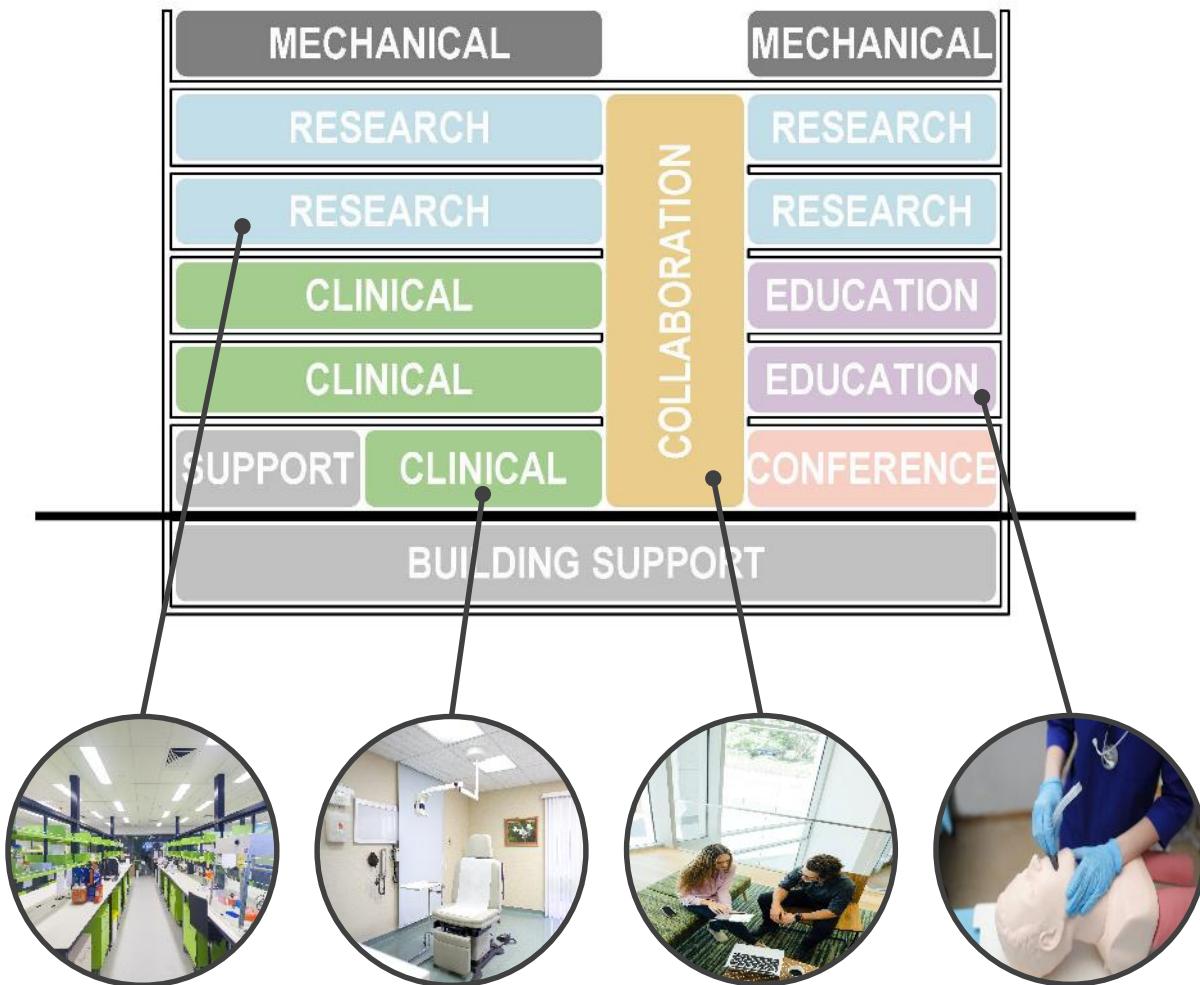


What Does a Translational Facility Look Like?





What Does a Translational Facility Look Like?





What can we learn from IVF Facility Design?

A Case Study

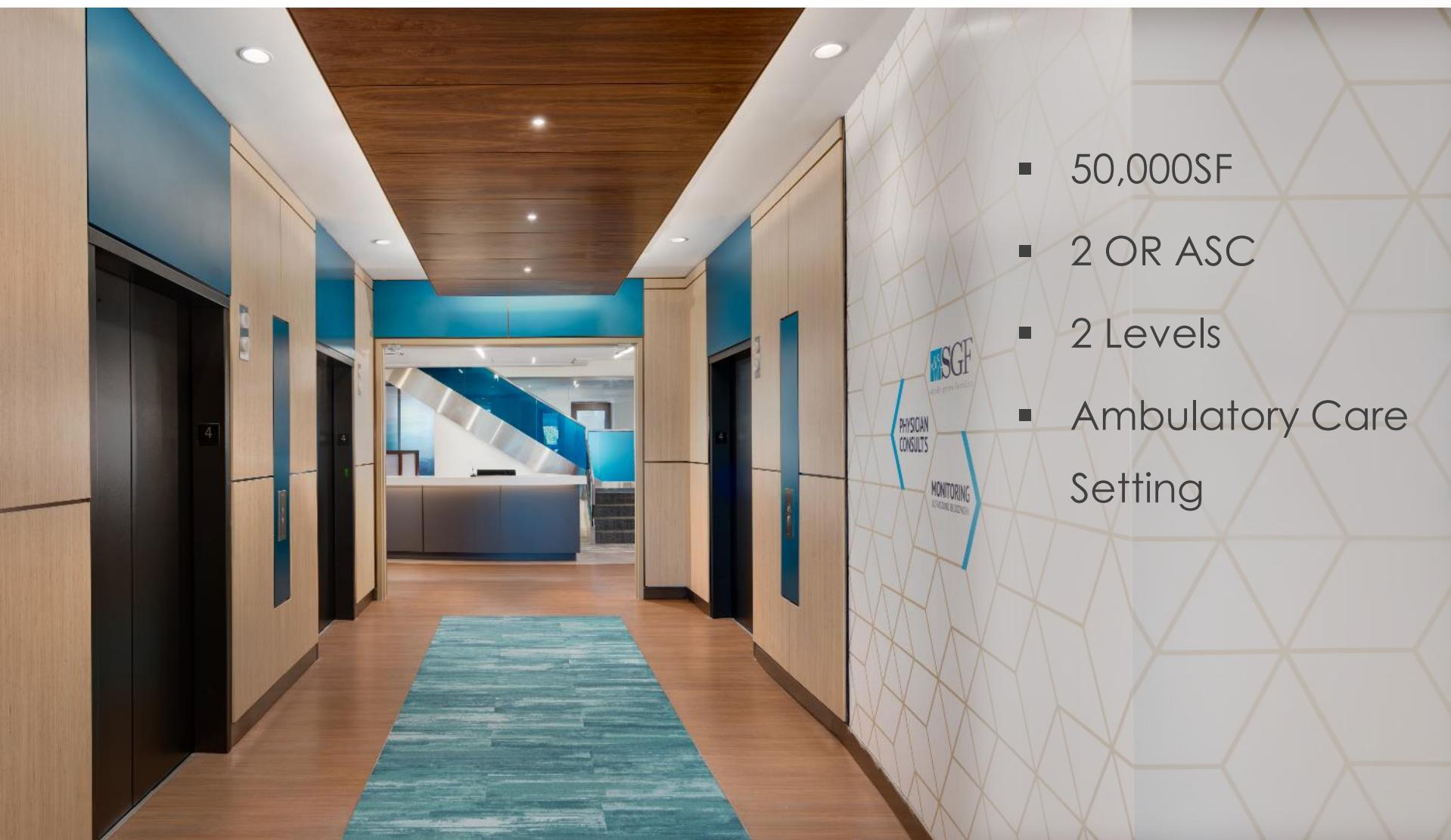
Case Study – Bench to Bedside to Bassinet



Fertility Health Provider

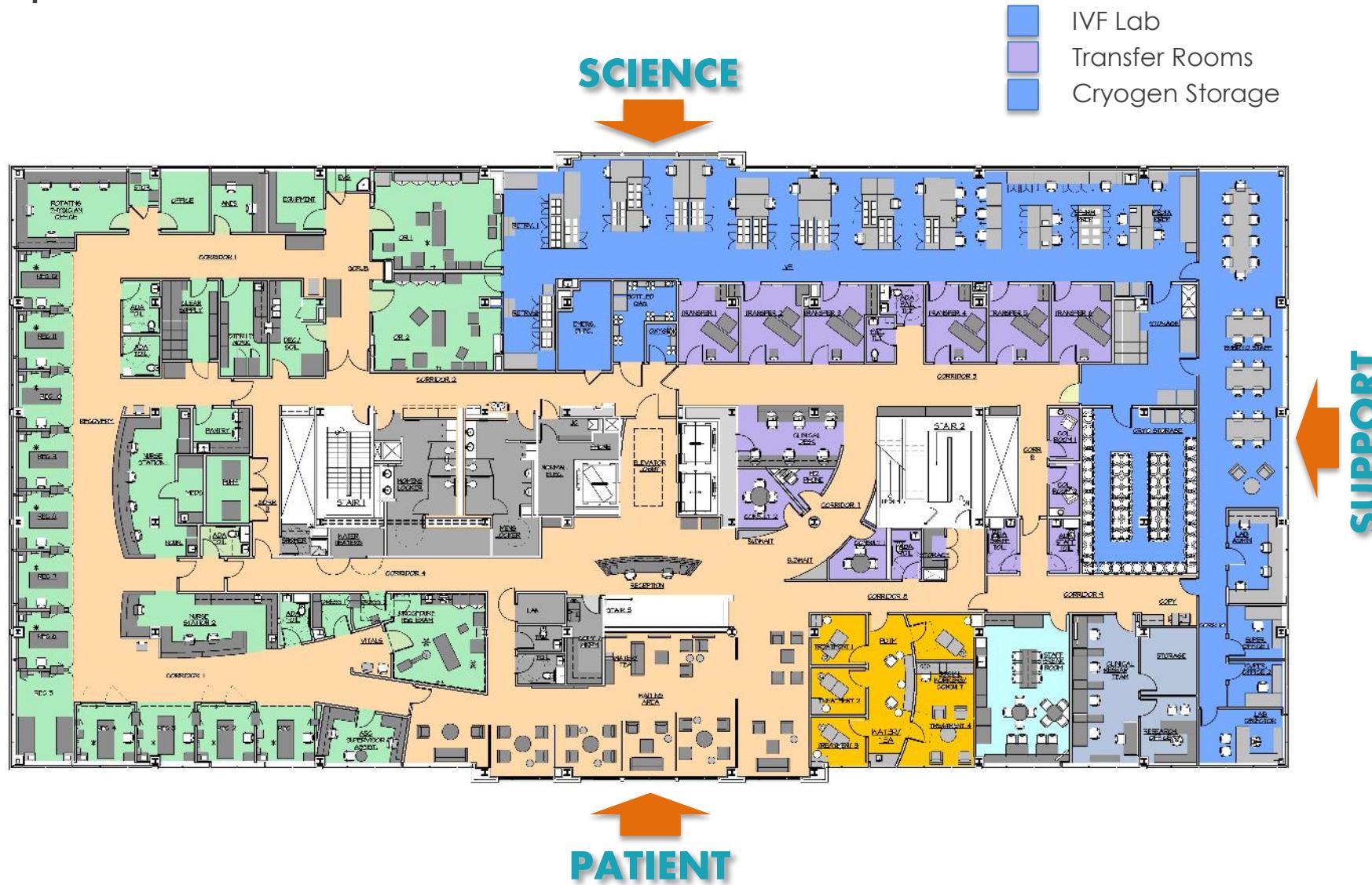
- Formed **26 years** ago
- One of **Largest Providers** of Fertility Health in the Country
- Facilities in **6 States** Serving National and International Patients

SGF Headquarters: Rockville, Maryland

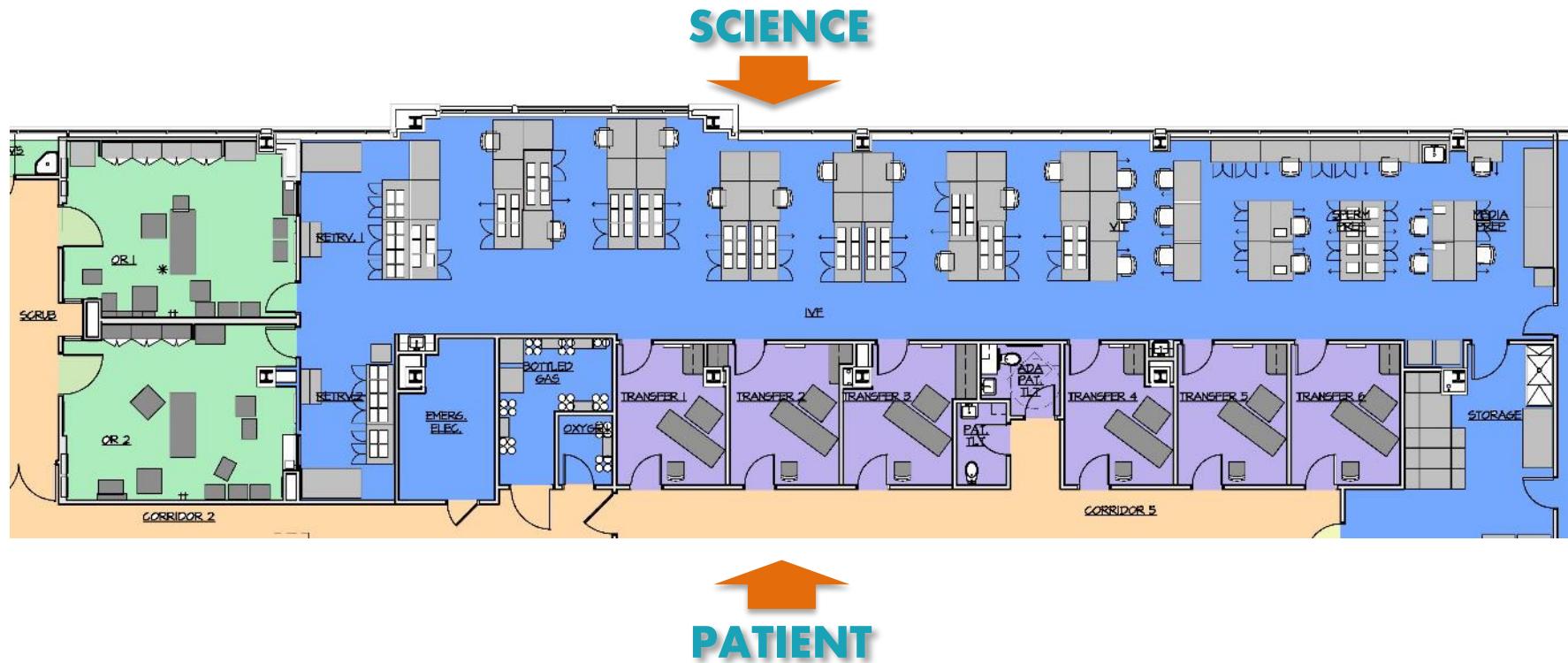


- 50,000SF
- 2 OR ASC
- 2 Levels
- Ambulatory Care Setting

Departmental Floor Plan



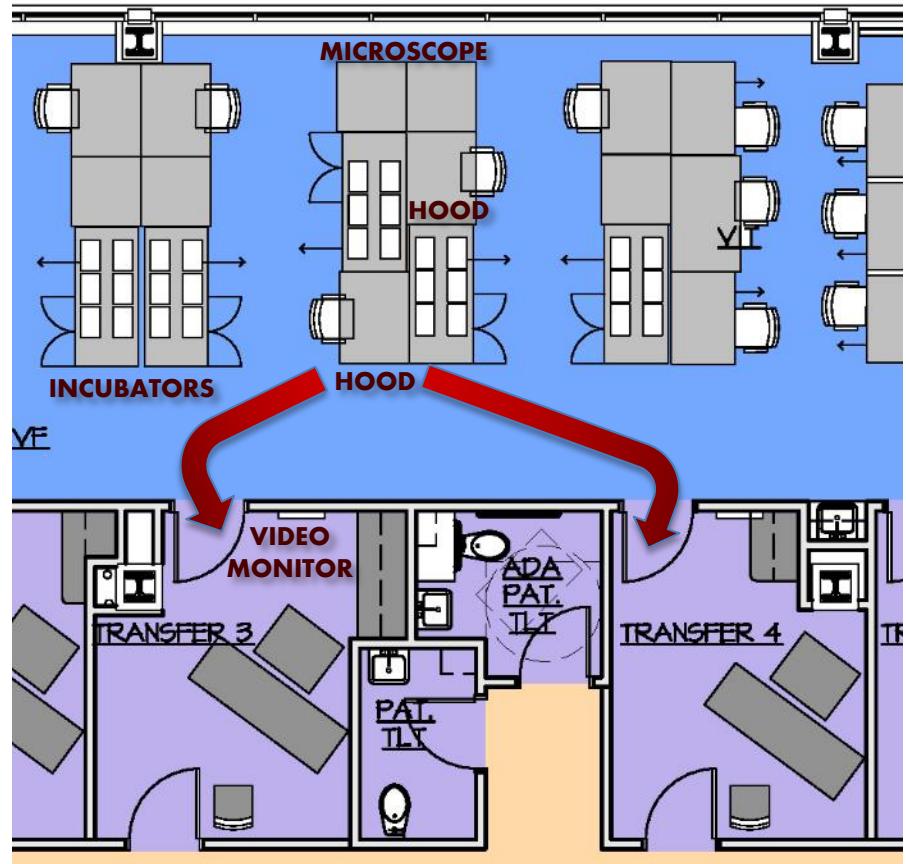
IVF Lab Floor Plan



- 12 Modular Work Cells
- 2 Retrieval Work Cells
- Sperm Prep
- 6 Uniform Transfer Rooms

IVF Bench to Bedside

- Uniform Work Cell
- Video Enabled Microscope
- Uniform Transfer Rooms



Genomics



Diagnosis and Treatment



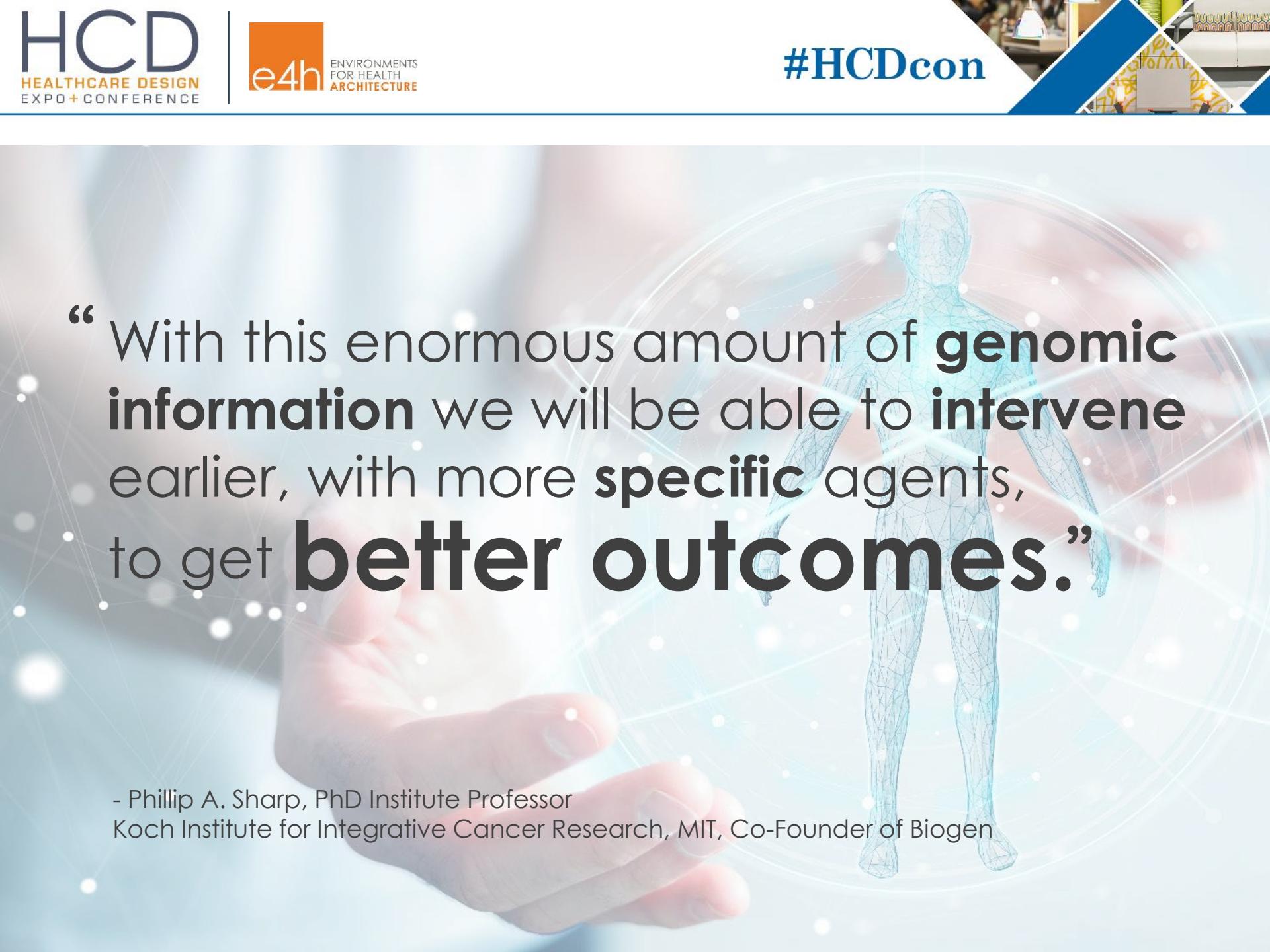
Lab Design



Translational Medicine



Healthcare Delivery



“With this enormous amount of **genomic information** we will be able to **intervene** earlier, with more **specific** agents, to get **better outcomes**.”

- Phillip A. Sharp, PhD Institute Professor
Koch Institute for Integrative Cancer Research, MIT, Co-Founder of Biogen