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.
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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

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

Cell

Chromosome

Gene

DNA

Nucleus

Nucleotides
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 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 single cells from embryos for genetic diseases and chromosomal disorders.

Embryo biopsy

Genetic testing of embryos
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

bench to bedside
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
Genomics Research
Genomics Research
Clinical Genomics
Clinical Genomics

PRE-amplification

master mix prep

specimen prep/ DNA extraction

POST-amplification

PCR/ post-PCR analysis

direction of workflow
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
- Transfer Rooms
- Cryogen Storage
- 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
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#HCDcon
“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