

# Data Science Update

**Dana E. Rollison, PhD**

Associate Center Director and Division Chief

Vice President, Chief Data Officer



## Agenda

- Faculty recruitment
- Moffitt Analytics Platform: The Next Generation

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## Joseph “Ross” Mitchell, PhD

### Previous Positions

- Professor of Radiology, Mayo Clinic, Phoenix, AZ
- Professor of Radiology & Biomedical Engineering, University of Calgary, Canada
- Founding Scientist, Calgary Scientific, Inc.
- Fellow, Alberta Machine Intelligence Institute, University of Alberta, Canada

### Education and training

- MSc, Computer Science, U of Regina & Alan Blair Cancer Clinic, Regina SK, Canada
- PhD, Medical Biophysics, Western U, London ON, Canada
- Postdoc, Department of Radiology, London HSC, London ON, Canada

### Methodological research

- Quantifying multiscale competitive landscapes of clonal diversity in glioblastoma (U01 CA220378). 09/2017-08/2022. Role: MPI

### Collaborative research

- Artificial intelligence, machine learning, deep learning
- Medical imaging, radiomics, time/frequency analysis, signal & image processing
- Computer vision, visualization



- Artificial Intelligence Officer
- Senior Member
- Department of Biostatistics & Bioinformatics
- Joined: January 2019

## New Faculty



### Qianxing "Quincy" Mo, PhD

- From Baylor
- Associate Member
- Department of Biostatistics & Bioinformatics
- Cancer Biology & Evolution Program
- Joined: July 2018



### Naomi Brownstein, PhD

- From Florida State
- Assistant Member
- Department of Biostatistics & Bioinformatics
- Program to be determined
- Joined: January 2019



### Mingxiang Teng, PhD

- From Dana Farber
- Assistant Member
- Department of Biostatistics & Bioinformatics
- Cancer Biology & Evolution Program
- Joined: October 2018

## Aik-Choon Tan, PhD Vice-Chair, Biostatistics & Bioinformatics



### Joins Moffitt Spring 2019

#### Previous Position

- Associate Professor, Department of Medicine, U of Colorado, Denver

#### Education and training

- PhD in computer science/bioinformatics from University of Glasgow
- Postdoc, Johns Hopkins Sidney Kimmel Cancer Center

#### Research Interests

- Translational bioinformatics and cancer systems biology, primarily by developing computational and statistical learning methods for the analysis & integration of high-throughput cancer "omics" data in understanding & overcoming treatment resistance mechanisms in cancer
- Currently working on 3 interconnected research themes:
  - Developing and Validating Predictive Biomarkers for Personalized Medicine
  - Overcoming Treatment Resistance
  - Elucidating Tumor-Host Microenvironment Signaling

## IMO Faculty Member, TBD



### Winners of the IMO Workshop 2018:

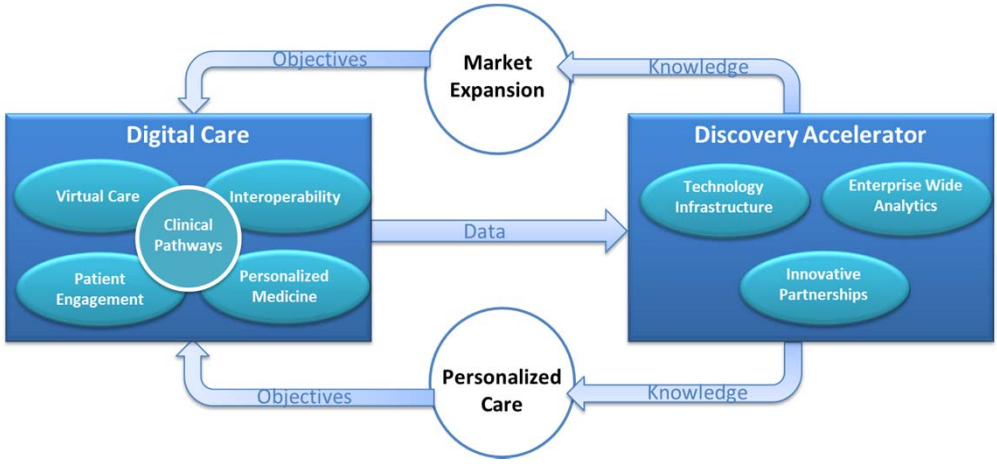
- “Designing and evaluating evolutionary therapies for advanced progressive thyroid cancer”
- Team lead: Joel Brown, PhD, Senior Member, IMO

- Assistant or Associate Member
- Expertise of new faculty member should:
  - Complement expertise of other Integrated Mathematical Oncology (IMO) faculty
  - Align with clinical areas of collaboration
- Promising candidate interviewed in Jan 2019

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# IMPACT 2028: Digital Care & Discovery Accelerator

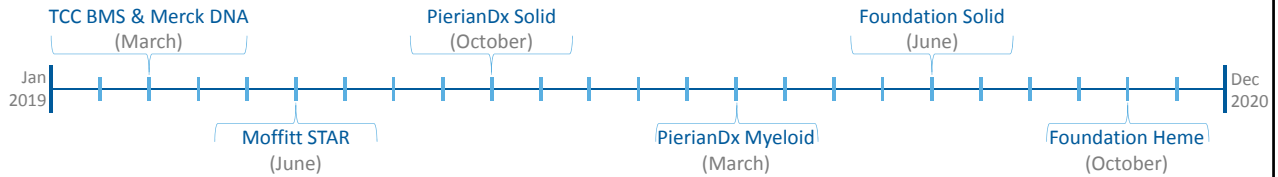


# Curated Data Marts Advancing Discovery

New data sources to be combined with data from the Health & Research Informatics Platform (HRI)	Examples of Curated Clinical Data Marts (CCSG Program alignment)			
	Precision Medicine (CBMM)	Imaging/Radiomics (CE, CBE)	Immunology (IMM)	Payer Strategies (HOB)
Molecular data	X	X	X	X
Curated drug data	X	X	X	X
NLP for pathology data	X	X	X	X
Image "bank"	X	X	X	
Abstracted data on outcomes (Avatar, Flatiron)	X	X	X	X
Disease-specific abstracted outcomes	X	X	X	X
Patient reported symptoms, quality of life	X	X	X	X

# Research & Clinical Molecular Data Integration

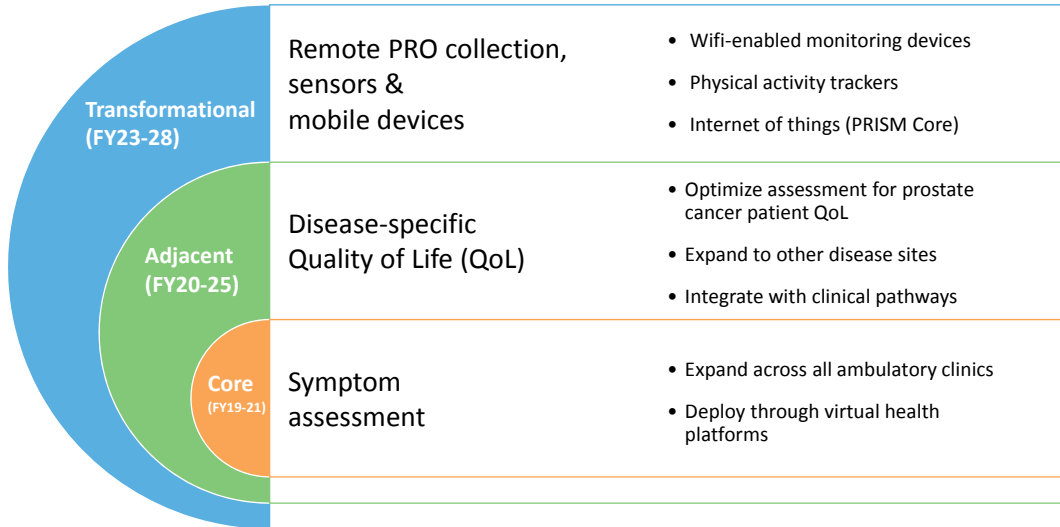
Sequence Type	Panel Description	# Samples
<b>Research grade (TCC):</b>		
Merck RNA	Gene expression profiles for TCC tumor tissues (2006-2012)	16,000
Merck DNA	NGS for tumor tissues collected for TCC (2006-2012)	3,380
BMS DNA	NGS for tumor tissues collected for TCC (2012-2014)	750
Avatar DNA/RNA	Tumor and germline DNA, tumor RNA for TCC/Avatar patients (2016-present)	> 1,700
<b>Clinical grade:</b>		
Pierian Solid	TruSight Tumor 26 (2014-2017, 26 genes): targeted sequencing panel for solid tumors	> 3,350
Pierian Solid	Moffitt STAR (2017-present, 170 genes): NGS targeting DNA and RNA from same FFPE sample	> 4,500
PierianDx Myeloid	TruSeq Myeloid (2014-2016), 32 genes), TruSight Myeloid (2016-present, 54 genes)	> 6,300
Foundation Solid	FoundationOne (2016-2018), 324 genes), FoundationOne CDx (2018-present, 325 genes): genomic profile for solid tumors	> 1,400
Foundation Heme	FoundationOne Heme (2016-present, 437 genes for DNA, 265 for RNA): genomic profile for hematologic malignancies and sarcomas	> 740



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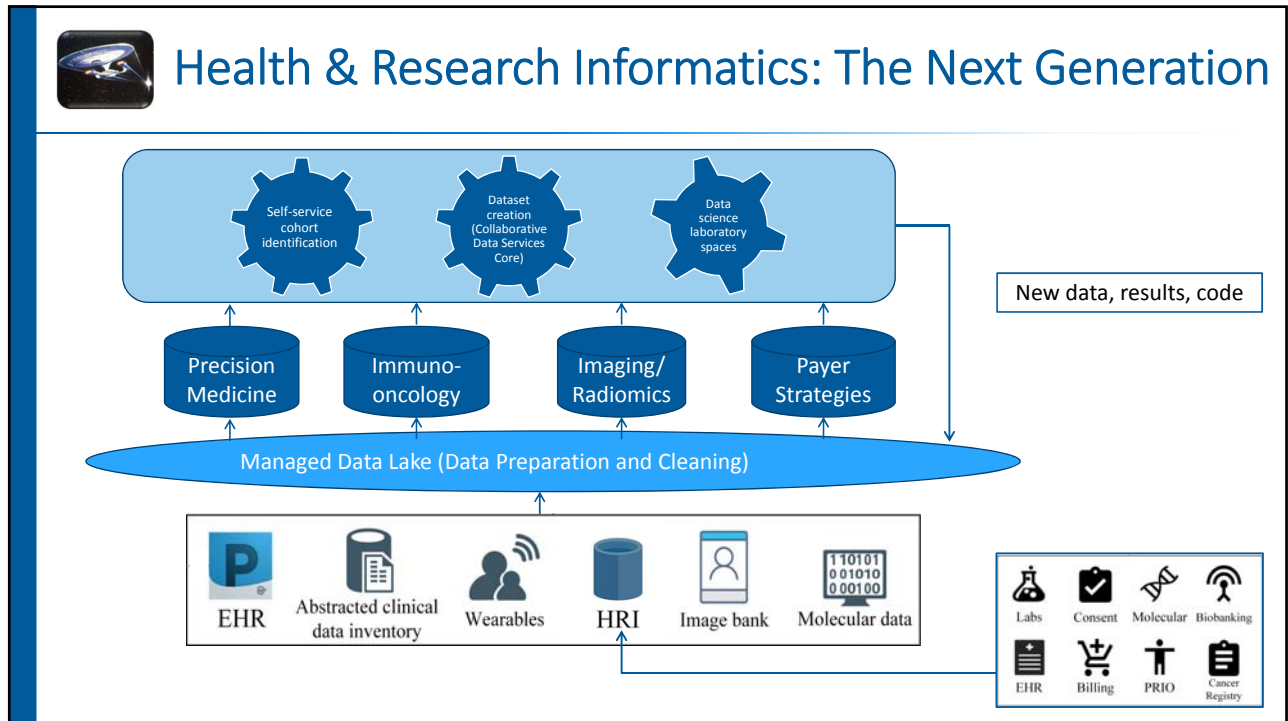
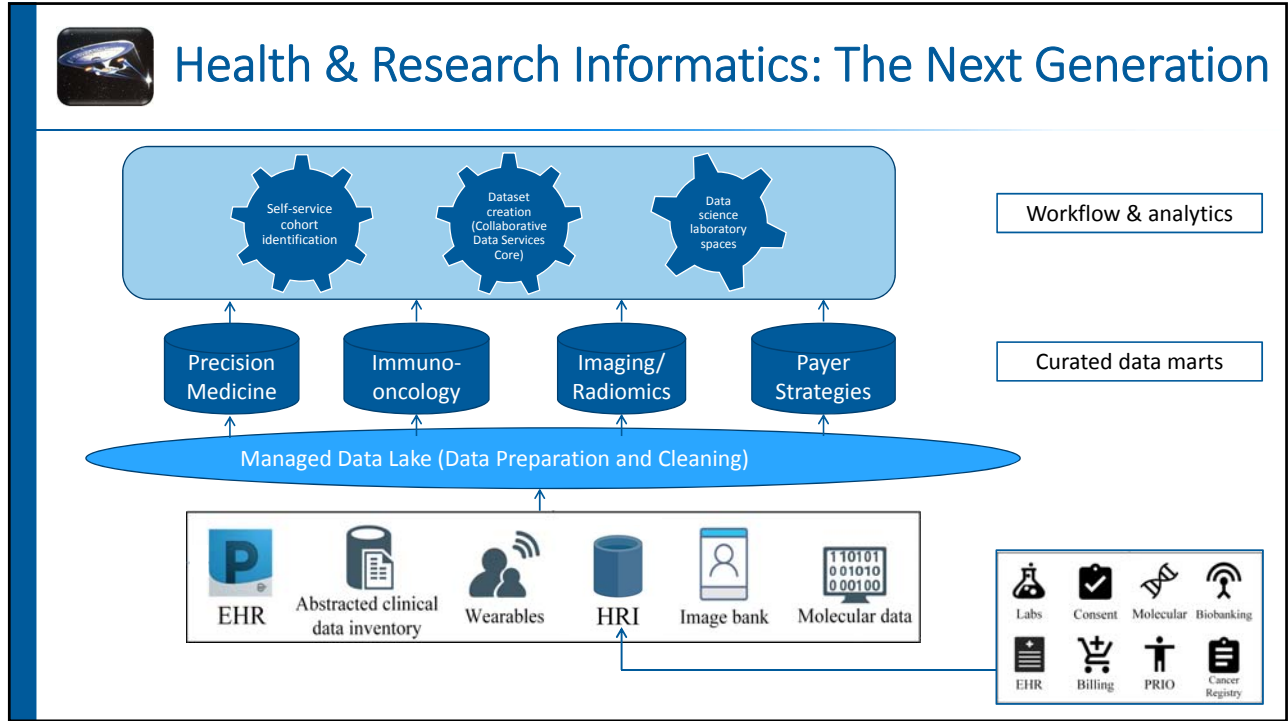
# IMPACT 2028: Roadmap for Patient-Reported Data



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Examples of Curated Clinical Data Marts (CCSG Program alignment)

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Molecular data	X	X	X	X
<div style="border: 2px solid blue; padding: 10px; width: fit-content; margin: 0 auto;"> <p><b>How will we build these curated data marts?</b></p> </div>				
Patient reported symptoms, quality of life	X	X	X	X





## Questions

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- How do we showcase our next-gen analytics platform in the CCSG?
- Considering the development of the next-gen platform will be phased over several years, how do we highlight both its current and future value?