The ORIEN Alliance:
Mobilizing the Nation's Leading Cancer Centers

ORIEN consists of 19 of the nation's leading cancer centers to deliver informatics-based solutions to accelerate therapy discovery, development and delivery of personalized medicine.
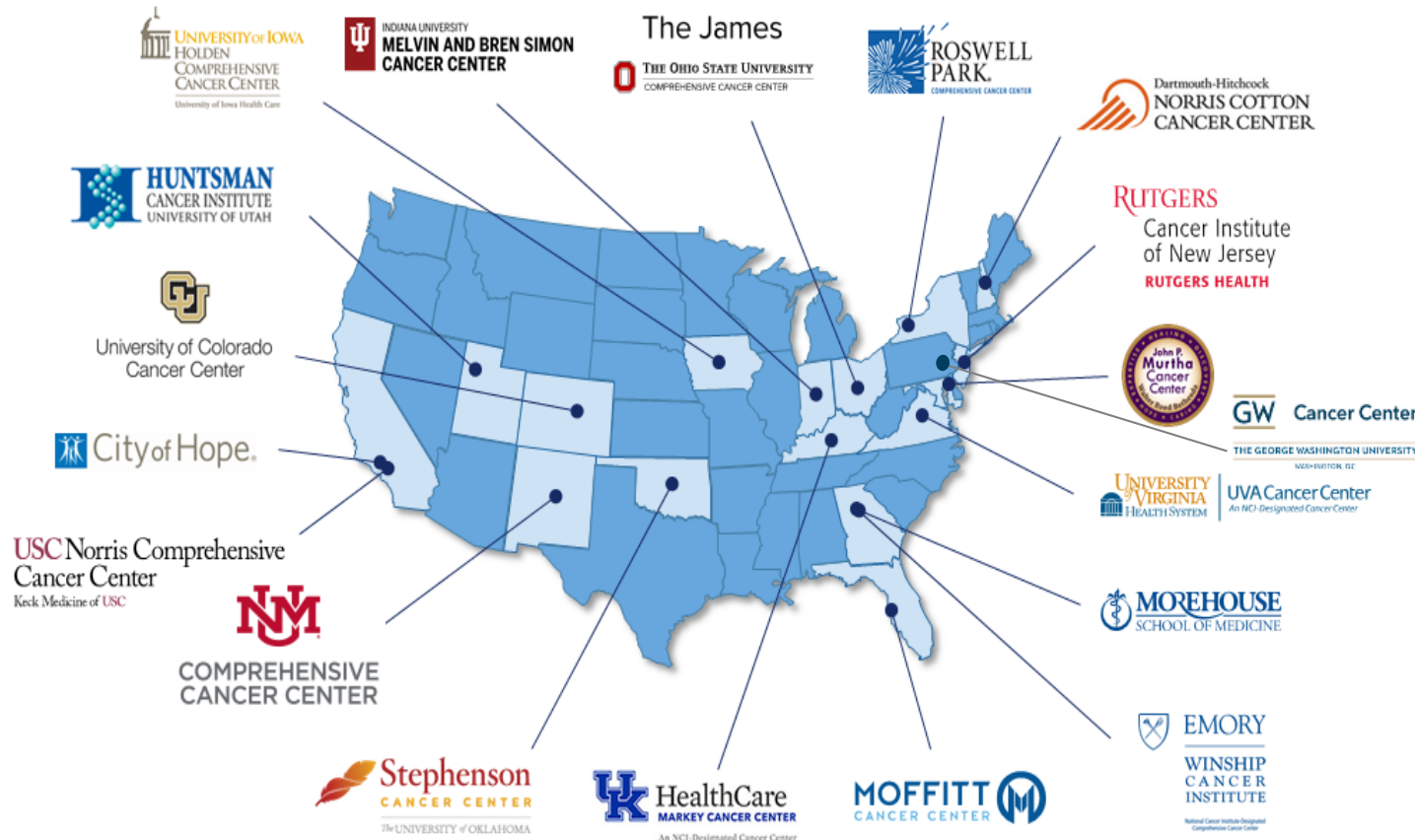
- **Scientific Leadership**
  - The Network includes some of the nation's leading cancer centers, clinicians and researchers

- **Clinical Trials Network**
  - M2Gen has implemented streamlined site activation protocols, including single IRB and scientific review committee to accelerate activation and enrollment

- **Serving Patients**
  - ORIEN represents a cross section of diverse patients, improving research and clinical trial coverage and health equity

Patient Partnership: Creating a Research Ecosystem

Through the Total Cancer Care® consent, the oncology data gathered enables patient engagement in research projects and clinical trials

| **10+** years of operating history | **19** leading cancer centers | **280,000+** patients consented to date | **25K-30K** patients added annually |

TOTAL CANCER CARE®

Patients consented to TCC agree to:

- Be followed throughout their lifetime, enabling collection of longitudinal clinical data

- Be re-contacted for future studies

- Donate specimens* to be used to generate laboratory data

*Subject to availability

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Who We Are

- Oncology-focused health informatics solutions company
- Leverages **clinical and molecular data** to accelerate the discovery, development and delivery of personalized therapies
- Founded in 2006 to operationalize the **Total Cancer Care® (TCC)** protocol, one the world's largest observational studies in cancer
- TCC provides a harmonized approach to link longitudinal clinical data with molecular information, enabling a much deeper understanding of a patient's disease.

TOTAL CANCER CARE

What We Do

- Facilitates the **Oncology Research Information Exchange Network® (ORIEN)**, a unique alliance of 19 of the nation's leading cancer centers, which have implemented the TCC Protocol
- Develops and commercializes **proprietary software solutions and data-based products** as well as data collection, bioinformatics, and clinical trial support services.
- Our core solution, **ORIEN AVATAR®**, generates annotated longitudinal clinical and molecular data to power the discovery and development of novel and more effective treatments

AVATAR

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ORIEN Goals:
Discover, Translate and Deliver

1   Using Data Science to Accelerate Discovery Through Data Sharing

2   Anticipating Need and Tracking Patients for Biomarker-Driven Clinical Trials

3   Developing an Evidence-based Clinical Decision Support Tool at Point of Care

ORIEN Guiding Principles

COLLABORATION

Commit to using a common protocol to ensure data quality and promote partnerships in research

INCLUSIVENESS

Participation by Cancer Centers, Community Providers and Patients in their respective communities

ACCESSIBILITY OF DATA

Real-time access to research data by using a hybrid model of both a centralized data warehouse and a federated component: a network model

PARTNERSHIPS

Establish trusted business relationships within and across sectors to achieve long-term program sustainability

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M2Gen is the Operational & Commercial Engine for ORIEN
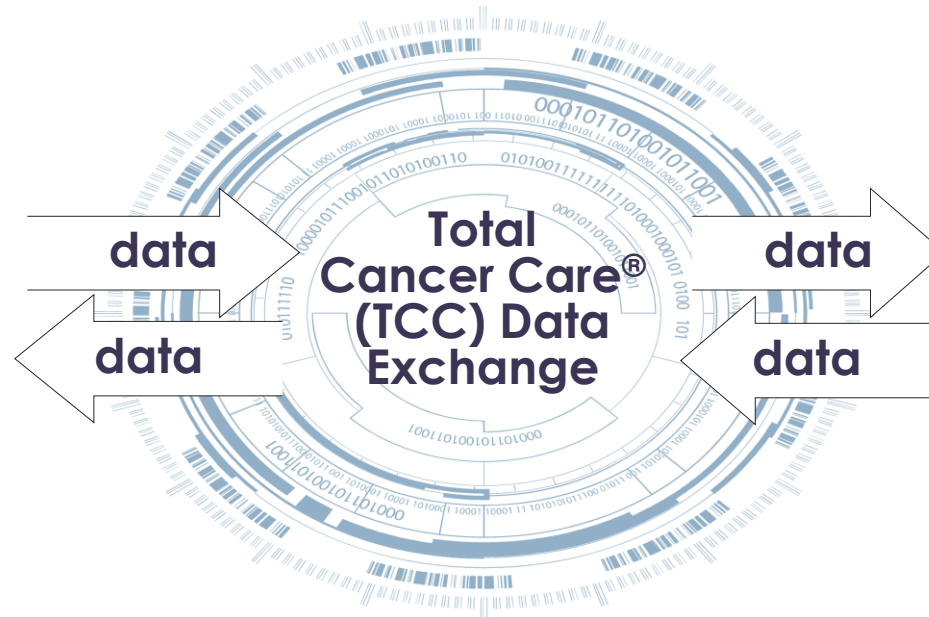
ORIEN   **M2GEN**

Collaboration & Inclusiveness

Participation by Cancer Centers in their respective communities

Operations

Accessibility of Data using federated and central data warehouse

Partnership & Commercialization

Commercial Partnerships to achieve long-term program sustainability

data →

← data

Total Cancer Care® (TCC) Data Exchange

data →

← data

ORIEN AVATAR

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ORIEN Avatar: Power of Cohort Surveillance

Investigate the impact of new targeted therapies

Using TCC Protocol, collect genotypic and phenotypic information to assign patients to an "in silico" community
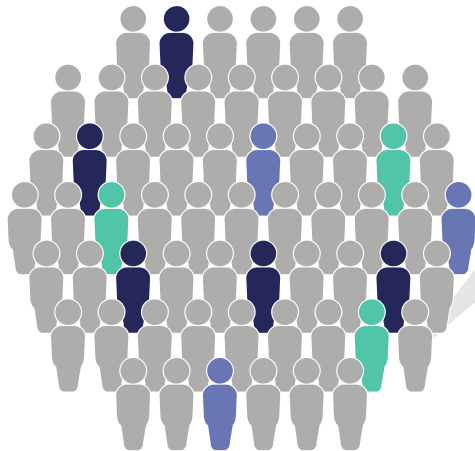
Biospecimens

Molecular Data

Longitudinal Data
- Clinical outcomes
- Healthcare utilization
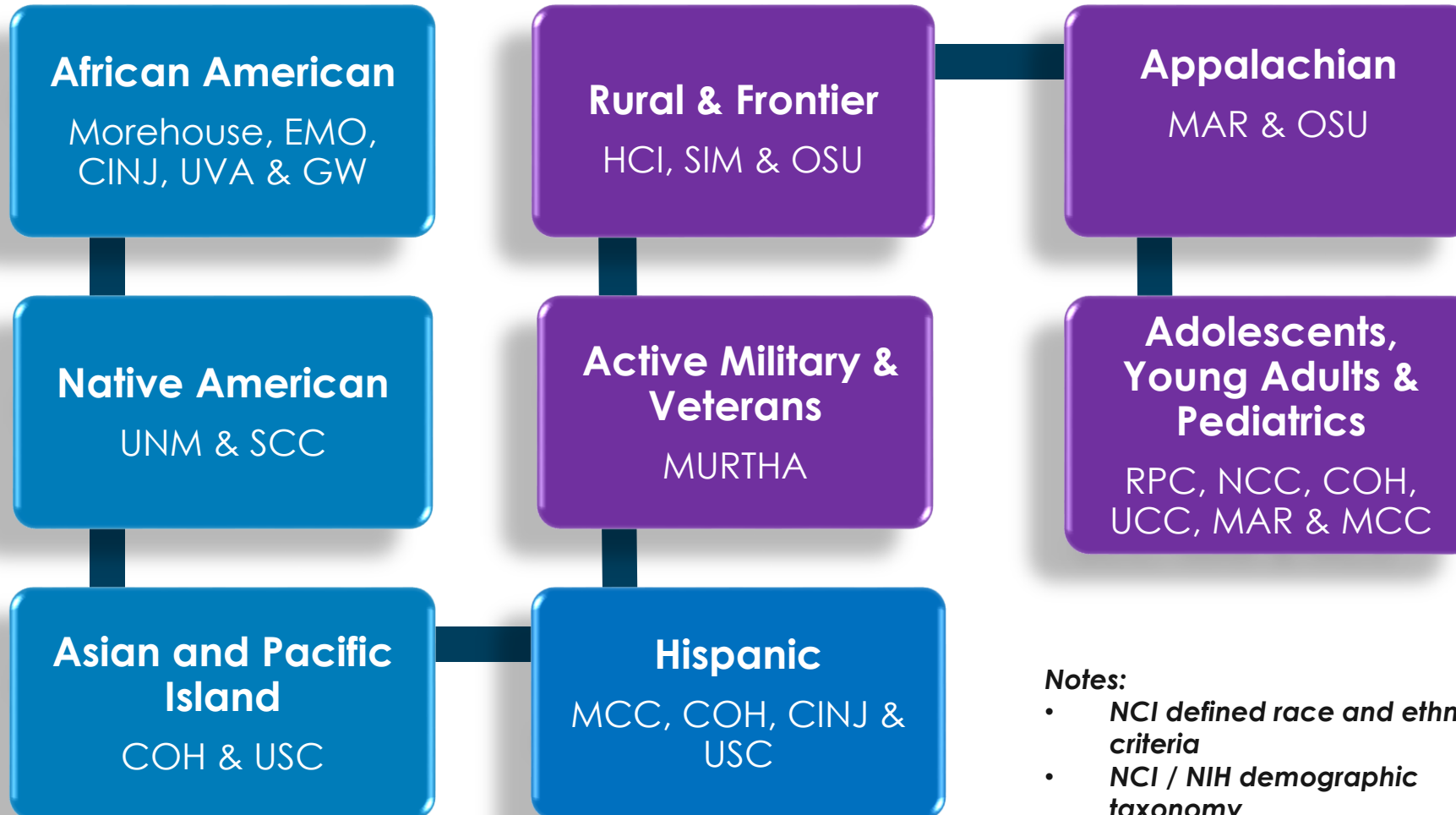- Patient-reported behaviors and outcomes

Providing a system of continuous learning and ability to anticipate need

Patient Demographics Across ORIEN

Race and Ethnicity

Population Demographics

African American
Morehouse, EMO, CINJ, UVA & GW

Native American
UNM & SCC

Asian and Pacific Island
COH & USC

Rural & Frontier
HCI, SIM & OSU

Active Military & Veterans
MURTHA

Hispanic
MCC, COH, CINJ & USC

Appalachian
MAR & OSU

Adolescents, Young Adults & Pediatrics
RPC, NCC, COH, UCC, MAR & MCC

Notes:
- *NCI defined race and ethnicity criteria*
- *NCI / NIH demographic taxonomy*

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ORIEN Patient Advisory Council Members

Name	Title/Position
Wendy Harpham, MD, FACP (Chair)	Author/Columnist on Survivorship; Survivor
Melissa Hudson, MD (Chair-Elect)	Director, Cancer Survivorship, St Jude
Deborah Collyar	Founder, Patient Advocates in Research; Survivor
Matthew Loscalzo, LCSW	Exec Director Supportive Care Medicine, COH
Barney D. Morris	Member, PCORI's Prostate Cancer Advisory Round Table; Survivor
Rear Admiral (Retired) Frederic G. Sanford, MD	Past Chairman Radiology, Naval Hospital San Diego; Caregiver
Joseph Simone, MD (Emeritus)	Clinical Director emeritus, Huntsman Cancer Institute

Wendy Harpham, MD, FACP

Melissa Hudson, MD
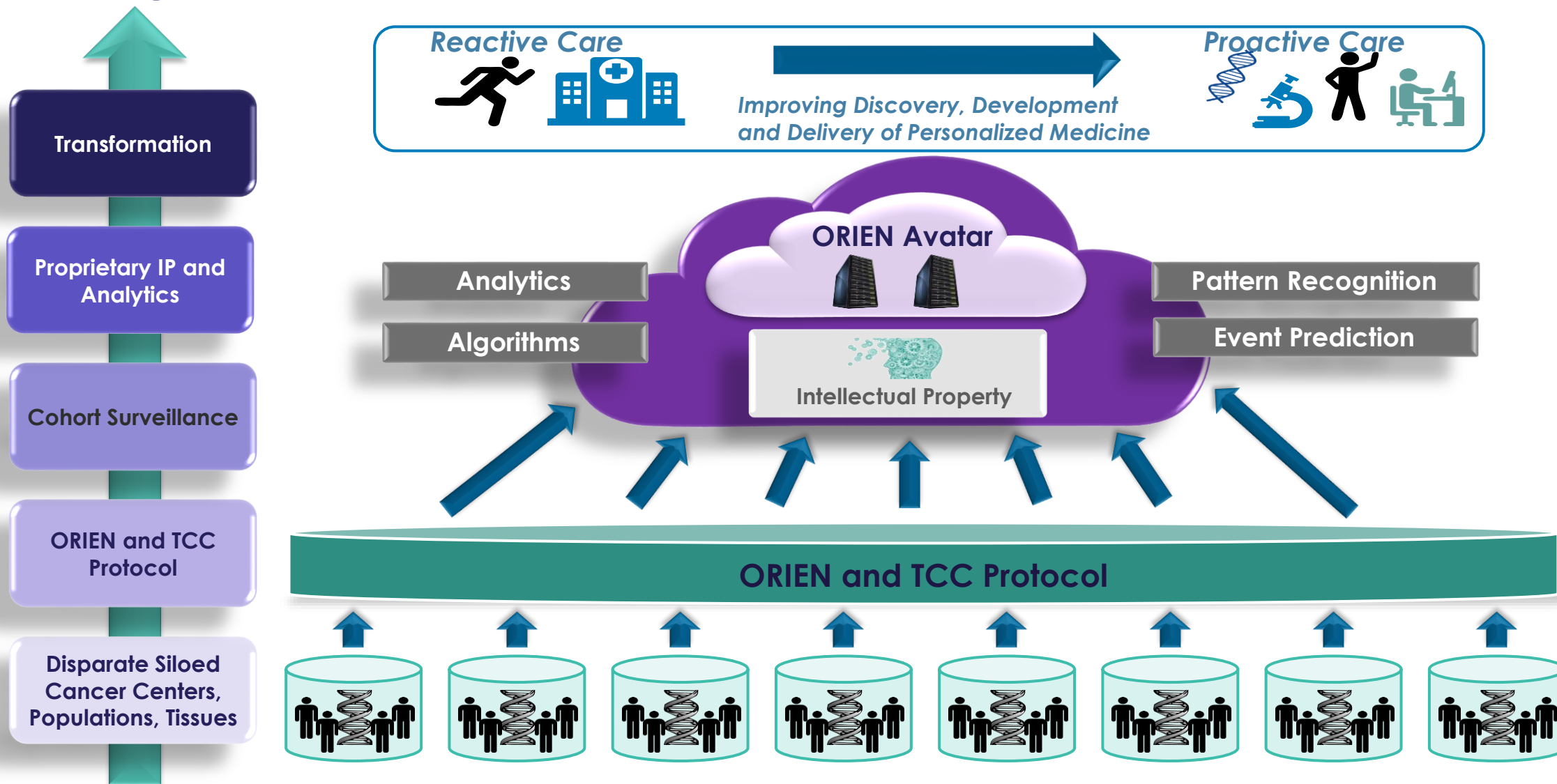
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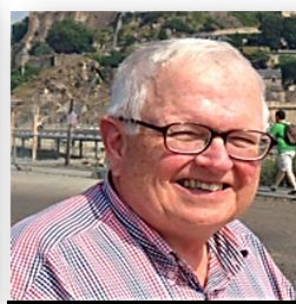
Frederic G. Sanford, MD

Joseph Simone, MD

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ORIEN Contracting Approach:
Master Agreements, Joinders and SOWs

ORIEN Master Collaboration Agreement	Master Service Agreement	Master CDA	Master Clinical Trial AGT/Terms & Conditions	Master IIT Agreement	Master Biospecimen & Data Research Agreement
Established ORIEN terms	Enables non-clinical trial industry projects through M2Gen	Provides one way overall confidentiality for project/trial documents shared across the Alliance	Establishes common terms between ORIEN and each sponsor for clinical trials	Establishes common terms between ORIEN members & M2Gen for IITs	Establishes common terms between ORIEN members & M2Gen for member projects

New Member Joinders to Existing Agreements

Addendums & SOWs

Addendums & Amendments	SOWs		SOWs	SOWs	SOWs
• Addendum to participate in ORIEN Avatar • Addendum to opt in to Data Sharing tiers	• SOW per industry project signed by Members participating		• Study addendum per project signed by Members participating	• SOW per IIT signed by Members participating	• SOW per research project signed by Members participating

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ORIEN Team Science: Intermember Research Projects

Master Biospecimen & Data Research Agreement

Establishes common terms between ORIEN members & M2Gen for member projects

SOWs

- SOW per research project signed by Members participating

8-12 weeks

PROJ. INTAKE

NETWORK ANNOUNCEMENT

STATEMENT OF WORK (SOW) EXECUTION

PROJ. INITIATION

SPECIMENS SHIPMENT/ DATA TRANSFER

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M2GEN Solutions: AVATAR

The depth and breadth of AVATAR molecular data enables identification of novel biomarkers associated with response to a wide range of oncology treatments

Cancer Type	#	Cancer Type	#
Breast	**1809**	Bladder	**459**
Colorectal	**1360**	Other GI	**431**
Head and Neck	**998**	Lymphoma	**350**
Sarcoma	**931**	Brain	**262**
Lung	**899**	Melanoma	**232**
Leukemia	**862**	Gastric	**193**
Thyroid	**835**	Other GYN	**172**
Myeloma	**818**	Other	**170**
Kidney	**813**	Other GU	**150**
Prostate	**807**	Liver	**133**
Endometrial	**767**	Other Cutaneous	**115**
Pancreatic	**658**	Esophageal	**89**
Ovarian	**664**	More than one disease	**121**
Total AVATAR Patients			**15,098***

Whole Exome Sequencing
19,396 genes sequenced at 300x coverage, ~440 cancer genes sequenced at 600X average depth, with matched normal for accurate somatic mutation calling

+

RNA Sequencing
Characterization of tumor transcriptome, including gene expression, fusion calling and other relevant information

Biomarkers	Analysis Capabilities	
MSI Status	SNVs & Indels	Microsatellite Instability (MSI)
Acquired Resistance	Gene Fusions	Cancer Type Prediction
Tumor-infiltration/ T-Cell infiltration	Gene Expression Signatures	Somatic Mutation Signatures
Tumor Microenvironment	Copy Number Analysis	HLA Typing
Presence of Neoantigens	Tumor Mutational Burden (TMB)	Neoantigen Prediction

* As of 07 FEB 20 release

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ORIEN Clinical Trials Network (OCTN)

ORIEN members have developed an efficient, timely and ethical scientific review of industry clinical trails brought forward by M2GEN and are committed to expediting trial activation

Goals

- Foster clinical research across ORIEN members
- Enhance partnership among member sites and industry sponsors
- Conduct efficient and rapid clinical trials
- Produce clinical trials of high data quality

Item	Description/Status
Single SRC	▪ Working with NCI, a mechanism for single SRC review has been established for OCTN ▪ *Status*: **Implemented**
Single IRB	▪ Each ORIEN member has agreed to utilize a single commercial IRB (WIRB) for review of new clinical trials through OCTN ▪ *Status*: **Implemented**
Patient Identification	▪ ORIEN physician's engagement and M2GEN informatics tools to track patients (TCC/AVATAR patients) provide the structure for proactive and ongoing patient identification and trial matching/enrichment ▪ *Status*: **Implemented**
Master Service Agreement	▪ M2GEN serves as central contracting point for service agreement for clinical trials ▪ *Status*: In Development
Single Trial Budget	▪ Develop harmonized budget template that consider regional cost factors ▪ *Status*: In Development

ORIEN CLINICAL TRIALS NETWORK

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OCTN - Accelerating Trial Enrollment

Finding the right patient, the right treatment at the right time
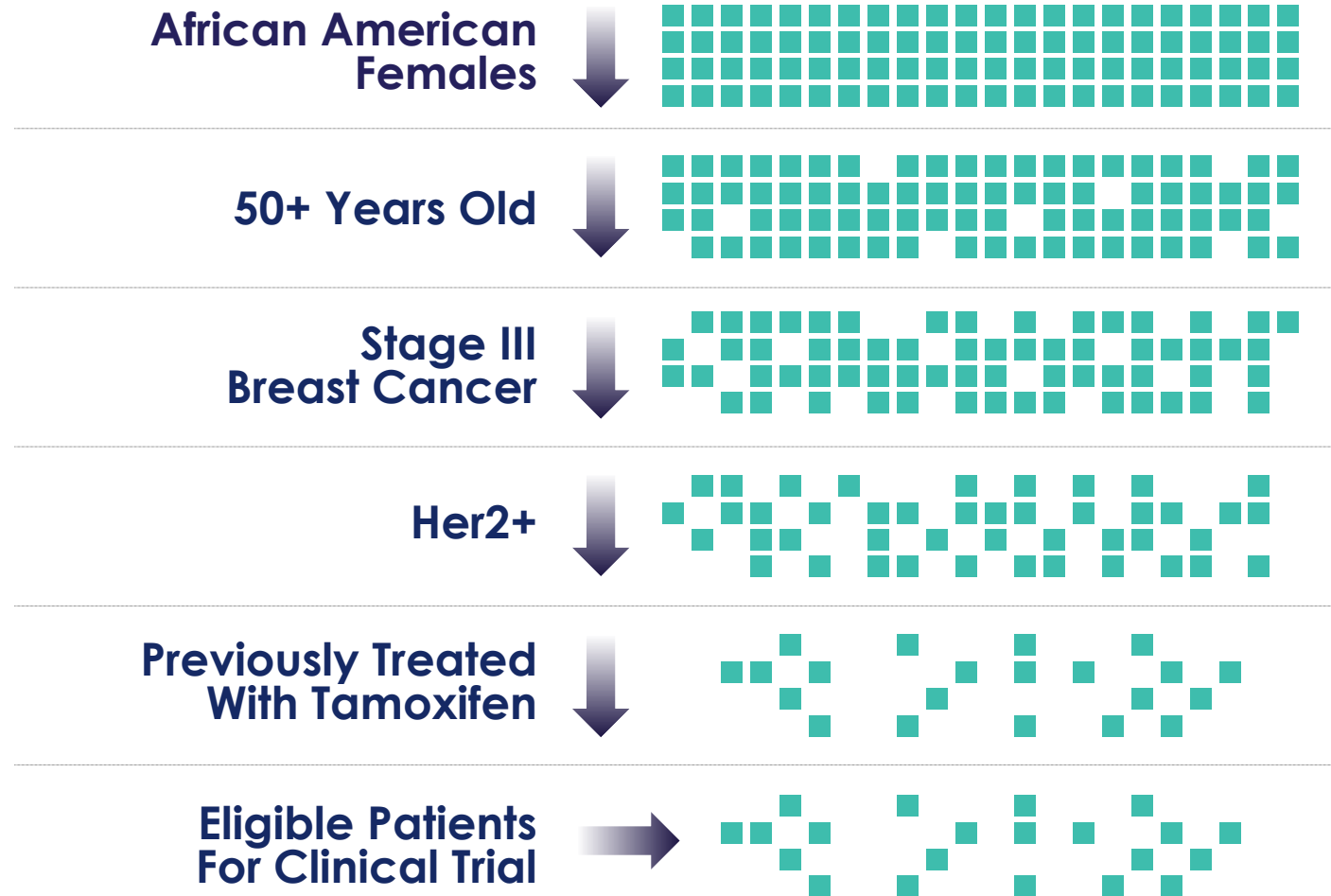
Real World Data for FDA Submissions

- M2GEN executed a license with one of the largest pharmaceutical companies in the US oncology market to provide RWD to create RWE of value for client to file for FDA approvals of new therapeutics

- The data license is focused on five different heme indications

- To support data collection for FDA submission, M2GEN implemented a 21CFR Part 11 compliant processes for data capture, provenance and delivery

- Subsequent submissions are planned through 2024

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Alliance for Digital Pathology Research Interests

(https://digitalpathologyalliance.org/november)

ORIEN-Alliance of Digital Pathology Interest Alignment

INTEREST

Truthing

VALUE

Availability and integration with other data, molecular and clinical elements

STRENGTH

Datasets from multiple sites, including expanding the dataset as data source and algorithm needs grow

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ORIEN-Alliance of Digital Pathology Interest Alignment

INTEREST

Payor Strategy

VALUE

Participate in Patient Preference Information (PPI) study for device evaluation; premarket clinical studies, benefit-risk assessments, and post-market evaluation
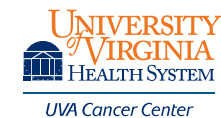
STRENGTH

- A patient data-driven ecosystem through the Total Cancer Care Protocol
- A dedicated patient advisory council

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Questions