Implementing Biospecimen Management and Data Federation Technologies to Support the UHN Research Community

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Biospecimen Management Technologies and Data Federation
UHN/TECHNA
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Project Description

- Originally funded by a CFI grant
- Biospecimen Management and related Clinical Annotation was one theme among many in this grant
- Deploy a robust, centralised UHN Biospecimen Management System
- Federate data with other UHN databases
- Integrate legacy data where practical
- Federate data dynamically where possible
- Persist federated data where necessary
- Small focused Team
  - 4 FTE Bootstrap
  - 2.4 FTE Ongoing Development
Principles

• Broad Focus (cancer and non-cancer research)
• Flexible Federated Data Model
• Utilize Open Source Software where possible
• Leverage Existing Infrastructure
• Minimize data transcription and duplicate data entry
• Capitalize on Existing Development Skill-Sets
• Ongoing Operational & Research Commitment
Primary Software Tools - Open Source

- **CaTissueSuite/Open Specimen**
  - Biospecimen Management System
  - Originally part of the caBig initiative
  - Software renamed “Open Specimen”

- **Caisis**
  - Clinical Annotation System
  - Developed at Memorial Sloan-Kettering
  - Contains Pathology and other clinical data captured from source systems or data entered by the user

- **Features**
  - Web based
  - Handles oncology and non-oncology datasets and specimens
  - Global Community of Support
  - No Ongoing Licensing Fees
Data Federation Tool

- SAP Business Intelligence
  - Robust data federation functionality
  - Aggregate data across multiple data sources
  - Data cleansing and parsing
  - Web-based interface and privilege-based access
  - Data visualisation via Dashboards and Reports
  - Federated data can be exported to a research analysis tool (Biomart, SAS etc.)
  - Software licensing required
Current state of the Project

- **Current Implementations**
  - UHN Biobank (All Technologies)
  - PM Cancer Registry (Federation Only)
  - UHN Cardiac Program (Federation Only)

- **Undergoing Implementation**
  - PM GU Bank
  - PM Leukemia Program
  - UHN Orthopaedics Program
  - Toronto Brain Bank

- **Implementation Discovery Underway**
  - UHN Liver Transplant
  - UHN Bone Marrow Transplant
  - Others…
Federation and Reporting Example

- User logs into a secure web portal
- Enters search criteria
- Returned results are dependent on the level of access granted to the users (e.g. scope of REB approval)
- Access to all systems and data included in the federation is permission based
- Permissions are granular to the field level
- Governance policies control who can access data in a particular system within the federation
Example: Federated Reports via SAP

Malignant site is Breast, Estrogen Receptor is Positive, Specimen Type is Frozen Tissue with available quantity greater than 0

<table>
<thead>
<tr>
<th>Clinical stage group</th>
<th>Path stage group</th>
<th>Malignant site</th>
<th>Morphology</th>
<th>Estrogen Receptor Results</th>
<th>Specimen Label</th>
<th>Tissue Site</th>
<th>Storage Container</th>
<th>Storage Location</th>
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</thead>
<tbody>
<tr>
<td>IA</td>
<td>IA</td>
<td>Breast</td>
<td>Infiltrating duct carcinoma, NOS (C50,)</td>
<td>Results from other specimen: Positive (100% strong)</td>
<td>U-HNL_G_4164</td>
<td>Breast, NOS</td>
<td>T6RJB9</td>
<td>35,1</td>
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Biospecimen Management and Clinical Annotation

Thank You

Questions?

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