Whole Slide Scanning Basic Concepts

• WSI can be: brightfield, fluorescent, and multispectral or a combination of these models.

• Focusing Methods vary from focusing every individual tile or focusing on selected tiles to using a series of focus points.

• Scanning can occur at multiple magnifications (20x, 40x)

• Quality of the capturing camera within a digital scanner will affect viewing resolution.

• Different scanner vary in their slide-loading capacity and scan time.
Whole Slide Scanning Recent Advances

• Recently, scanning processes incorporate continuous automatic refocusing processes, which has further increased the quality of scans.

• Tissue recognition features allowing automatic detection of the histology specimen via a low-magnification overview scan greatly increasing scanning efficiency.

• Better Optics and faster scanning times.
Whole Slide Scanning Basic Concepts
Image Quality
Considerations For Choosing A Scanner

• Fit for purpose (Nature of lab specimens: Capacity, Z axis, magnification)

• Quality of Images

• Ease of use

• Lab infra-structure and digital experience.

• DIACOM Readiness
Digital Interface Advantages

• Easy delivery (avoiding glass handling limitations)
• Remote access
• Digital annotation
• Rapid navigation/magnification
Digital Interface Advantages

• Take snap shots

• Export

• Computer-assisted viewing

• Enables Image Analysis applications

• H&E and IHC (synched viewing)
### URGENT
You have 2 urgent cases:

<table>
<thead>
<tr>
<th>Received Date</th>
<th>Case ID</th>
<th>Patient</th>
<th>Age</th>
<th>Gender</th>
<th>Tissue Type</th>
<th>Attachment</th>
<th>Slides</th>
<th>Case Status</th>
<th>Report</th>
<th>Shared</th>
<th>Bookmark</th>
<th>Tags</th>
</tr>
</thead>
<tbody>
<tr>
<td>01/17/20...</td>
<td>Case 322...</td>
<td>Jane, Mary</td>
<td>0</td>
<td>F</td>
<td>Breast</td>
<td></td>
<td>3</td>
<td>In-Progress</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>01/07/20...</td>
<td>Test Case</td>
<td>Jane, Mary</td>
<td>0</td>
<td>F</td>
<td>Breast</td>
<td></td>
<td>4</td>
<td>In-Progress</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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</table>

### ASSIGNED
You have 7 cases assigned to you:

<table>
<thead>
<tr>
<th>Received Date</th>
<th>Case ID</th>
<th>Patient</th>
<th>Age</th>
<th>Gender</th>
<th>Tissue Type</th>
<th>Attachment</th>
<th>Slides</th>
<th>Case Status</th>
<th>Report</th>
<th>Shared</th>
<th>Bookmark</th>
<th>Tags</th>
</tr>
</thead>
<tbody>
<tr>
<td>01/08/20...</td>
<td>Case 1</td>
<td>Stark, San...</td>
<td>0</td>
<td>F</td>
<td>Breast</td>
<td></td>
<td>5</td>
<td>In-Progress</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>01/17/20...</td>
<td>Case 239...</td>
<td>Lou, Mary</td>
<td>50</td>
<td>F</td>
<td>Breast</td>
<td></td>
<td>3</td>
<td>In-Progress</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>01/17/20...</td>
<td>Case 621...</td>
<td>Stark, San...</td>
<td>0</td>
<td>F</td>
<td>Breast</td>
<td></td>
<td>2</td>
<td>In-Progress</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>01/17/20...</td>
<td>Test X</td>
<td>Jerry, Mary</td>
<td>0</td>
<td>F</td>
<td>Brain</td>
<td></td>
<td>2</td>
<td>In-Progress</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 days ago</td>
<td>Breast Ca...</td>
<td>Stark, San...</td>
<td>0</td>
<td>F</td>
<td>Breast</td>
<td></td>
<td>5</td>
<td>In-Progress</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Challenges with PD-L1 scoring

Tumor cells (blue arrow) adjacent to alveolar macrophages (black arrow)

Positive alveolar macrophage staining (black arrow) adjacent to PD-L1 negative tumor (blue arrow)
Advanced case data management
Create and manage cases, assignment and accessioning, patient information, physician information and case reassignment

Performing quality checks
Proactively reviewing slide images to maintain scanned image quality and manage lab throughput and efficiency

Collaboration with pathologists
Digitally collaboration for manage slide scan and rescan requests
**Users and roles management**
Create and manager users and their privileges within uPath software

**Multi-site customize deployments**
Manage multi-site or multi-client deployments

**System rules and policies**
Manage system level configurations, image retention rules and password policies

**Audit and track**
Generate user/usage audit reports

**Create customs configurations for pathologist**
Create custom tissue types, preset comments and report templates and manage installed algorithms
Annotation of Whole Slide Images Using Touchscreen Technology
Jessica L. Baumann1, Karl Garsha2, Mike S. Flores 1, Faith Ough 1, Ehab A. ElGabry 1
Digital Interface Considerations

- Viewing software can be installed locally, or residing on network servers.
- Viewers packaged with algorithms
- A la carte fashion software services
- Downloading, processing and resolution
- Free open-source whole slide image viewers are available
Presentation overview

– Digital Pathology Historical Milestones
– Challenges of current practice model and the need for digital pathology solutions
– Definition of DP
– Digital pathology LAB infrastructure essentials
– Current and future digital pathology applications
Digital Pathology Current Applications

- Frozen consults
- Primary diagnosis
- Secondary consults using WSI
- Archiving
- Publications (links)
- Tumor Boards
- Education and Training
Education

• Undergraduate/allied health care professionals

• Postgraduate: Residency/Fellowship training

• Leveling expertise (rare cases / developing countries)

• Practicing pathologists (continued education / proficiency testing)

• Industry

• Patient education

• Tracking tools to accelerate learning curve

• Digital Anatomic Pathology Academy (DAPA) was recently announced by the DPA
Formalized training programs leveraging digital platforms

*Universal Training programs for PDL1*