### Non-Small Cell Lung Cancer Biomarker Pathway

<table>
<thead>
<tr>
<th>Consensus Molecular Panel, 2018</th>
<th>EGFR</th>
<th>ALK</th>
<th>KRAS</th>
<th>MET</th>
<th>HER2</th>
<th>BRAF</th>
<th>PD-L1</th>
</tr>
</thead>
<tbody>
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</tbody>
</table>

**Clinical scenario**
Initial diagnosis on biopsy material

**Assay ordering process**
Reflexive order initiated by pathology

**Methodology**
- Current send-out to Neogenomics
  - Transition to Foundation One CDx
- In-house NGS validation in process

### Colon Cancer Biomarker Pathway

<table>
<thead>
<tr>
<th>Consensus Molecular Panel, 2018</th>
<th>BRAF and extended RAS (KRAS / NRAS)</th>
</tr>
</thead>
<tbody>
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</table>

**Clinical scenario**
Late stage (III/IV)

**Assay ordering process**
Reflexive order initiated by pathology

**Methodology**
- In-house KRAS/BRAF
- Send-out NRAS
- Complete in-house NGS validation in process

### GYN/ONC Biomarker Pathway

<table>
<thead>
<tr>
<th>Consensus Molecular Panel, 2018</th>
<th>Somatic BRCA1/BRCA2 mutation</th>
<th>Homologous Recombinant DNA Repair (HRD) phenotype</th>
</tr>
</thead>
<tbody>
<tr>
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</table>

**Clinical scenario**
Serous carcinomas eligible for PARP inhibitor

**Assay ordering process**
Clinician generated

**Methodology**
- Send-out to Myriad
### CNS Tumor Biomarker Pathway

<table>
<thead>
<tr>
<th>Consensus Molecular Panel, 2018</th>
<th>IDH1 mutation status</th>
<th>MGMT promoter methylation status</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1p/19q rearrangement</td>
<td></td>
</tr>
</tbody>
</table>

**Clinical scenario**
- Grade III and IV astrocytoma / GBM
- Initial diagnosis on biopsy / resection material

**Assay ordering process**
Reflexive order initiated by pathology

**Methodology**
- IDH1-R132 immunohistochemistry send-out to Mayo
  - In-house assay validation in process
- MGMT hypermethylation assay send-out to Mayo
- 1p/19q analysis sent out to Mayo

### Melanoma Biomarker Pathway

<table>
<thead>
<tr>
<th>Consensus Molecular Panel, 2018</th>
<th>BRAF mutation</th>
<th>KIT mutation</th>
</tr>
</thead>
</table>

**Clinical scenario**
Recurrent / metastatic melanoma

**Assay ordering process**
Clinician generated – transitioning to pathologist’s reflexive order based on updates to NCCN guidelines

**Methodology**
- In-house BRAF mutation analysis
- KIT mutation assay send-out to Mayo
  - In-house assay validation in process

### Thyroid Cancer Biomarker Pathway

<table>
<thead>
<tr>
<th>Consensus Molecular Panel, 2018</th>
<th>BRAF mutation analysis</th>
<th>? Sequencing of atypical FNAs (Afirma vs. Thyroseq)</th>
</tr>
</thead>
</table>

**Clinical scenario**
- Initial diagnosis of papillary carcinoma on thyroidectomy
- Thyroseq panel on subset of initial thyroid FNA

**Assay ordering process**
- BRAF reflexive order initiated by pathology
- Sequencing of atypical FNAs ordered by clinician. Transitioning to reflexive order by pathologist on FNAs with uncertain histology

**Methodology**
- In-house BRAF mutation analysis
- Afirma / Thyroseq send-out

### Molecular Universal Lynch Screening

<table>
<thead>
<tr>
<th>Consensus Molecular Panel, 2018</th>
<th>MMR IHC</th>
<th>Microsatellite Instability (MSI)</th>
<th>BRAF mutation analysis when appropriate</th>
<th>MLH1 methylation analysis when appropriate</th>
</tr>
</thead>
</table>

**Clinical scenario**
- Initial colon cancer diagnosis on biopsy or resection specimen
- Initial endometrial cancer diagnosis on hysterectomy
- Initial diagnosis of ovarian endometrial and clear cell carcinoma oophorectomy

**Assay ordering process**
Reflexive order initiated by pathology

**Methodology**
- In-house MMR IHC and BRAF mutation analysis
- MSI and MLH1 methylation analysis send-outs to Mayo

### Checkpoint Inhibitor Biomarker Pathways
<table>
<thead>
<tr>
<th>Tumor Type</th>
<th>Reporting Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lung tumors</td>
<td>PD-L1 (22C3) IHC Tumor Proportion Score (TPS) report format</td>
</tr>
<tr>
<td>Gastric / GEJ tumors</td>
<td>PD-L1 (22C3) IHC Combined Proportion Score (CPS) report format</td>
</tr>
<tr>
<td>Colon</td>
<td>MMR / MSI</td>
</tr>
<tr>
<td>Endometrial</td>
<td>MMR; MSI when appropriate</td>
</tr>
<tr>
<td>Other</td>
<td>MMR/MSI</td>
</tr>
</tbody>
</table>