ALBERTA PRECISION LABORATORIES
Leaders in Laboratory Medicine

Laboratory Bulletin

DATE:	2022 March 21
TO:	South Sector Oncologists, Pathologists and Technical Staff
FROM:	Molecular Pathology Program, Alberta Precision Laboratories
RE:	**New Molecular Test Algorithm for Advanced Stage Lung Adenocarcinoma Patients**

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Key Message

- As of April 4, 2022, in Molecular Pathology South, all advanced stage lung adenocarcinoma cases with requested molecular predictive biomarker testing will undergo a new testing algorithm that incorporates RNA next generation sequencing (NGS) using a custom **Lung Carcinoma Fusion RNA Panel** (FusionPlex assay, ArcherDx Inc / Invitae) to detect targetable gene fusions. MassArray HS Lung testing will be performed first, and cases negative for *EGFR, KRAS, BRAF* and *ERBB2* mutation will be reflexively tested on the fusion panel.
- ALK and ROS1 immunohistochemistry will be discontinued as reflexive testing.

Background

- As the number of targetable mutations in lung adenocarcinoma continues to grow, sequential single-gene testing methodologies (including immunohistochemistry and FISH) become unsustainable due to prolonged turnaround times and tissue exhaustion.
- The Lung Carcinoma Fusion RNA Panel is validated to detect fusions, oncogenic isoforms and/or selected single nucleotide variants (SNVs) and small insertions/deletions (indels) in the following 17 genes: *ALK, BRAF, EGFR, ERBB2, FGFR1, FGFR2, FGFR3, KRAS, MET, NRG1, NTRK1, NTRK2, NTRK3, NUTM1, PIK3CA, RET, ROS1*
- The MassArray HS Lung DNA panel will continue to be utilized; it covers selected hotspot SNVs/indels in *EGFR, KRAS, BRAF, ERBB2* and *PIK3CA.*

How this will impact you

- **Pathology:** As of April 4, 2022, you may order reflex lung panel molecular testing and PD-L1. But do not order reflexive ALK and ROS1 IHC on advanced stage lung adenocarcinoma.
- **Oncology:** A single report with combined MassArray HS Lung +/- Lung Carcinoma Fusion RNA Panel results will be distributed through Cerner Millennium. The results will be available in Netcare. The target turnaround time is 10 working days from tissue receipt in the Molecular Pathology laboratory.

Action Required

- **Pathology: Cease ordering reflex ALK and ROS1 IHC** on newly diagnosed advanced stage lung adenocarcinoma cases. Continue to order PD-L1 and lung panel molecular testing as per current practice.
    - **When possible (depending on tumor percent and tissue volume), preferentially order lung panel molecular testing on non-CytoLyt®-exposed FFPE tissue biopsies (eg endobronchial biopsies; "SH" cases)** as these samples perform better than concurrent CytoLyt®-exposed FFPE cell blocks from cytology specimens ("NF" cases).
- **Oncology:** Continue to request lung biomarker testing in the same way as previously. Look for lung adenocarcinoma molecular test results on Netcare. The report will include MassArray HS Lung results, +/- Lung Carcinoma Fusion RNA Panel results, as required.

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Effective **April 4, 2022**

Questions/Concerns

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