**Eligibility Criteria**

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| Ages Eligible for Study: | 18 Years and older   (Adult, Older Adult) |
| Sexes Eligible for Study: | All |
| Accepts Healthy Volunteers: | No |

**Criteria**

Inclusion Criteria:

* PATIENT PRE-REGISTRATION ELIGIBILITY CRITERIA:
* For pre-surgical patients
  + Suspected diagnosis of resectable non-small cell lung cancer; cancers with a histology of "adenosquamous" are considered a type of adenocarcinoma and thus a "nonsquamous" histology; patients with squamous cell carcinoma are eligible only if the registering site has EA5142 Institutional Review Board (IRB) approved
  + Suspected clinical stage of IIIA, II (IIA or IIB) or large IB (defined as size >= 4cm); Note: IB tumors < 4cm are NOT eligible; stage IB cancer based on pleural invasion is not eligible unless the tumor size is >= 4cm
* For post-surgical patients
  + Completely resected non-small cell lung cancer with negative margins (R0); patients with squamous cell carcinoma are eligible only if the registering site has EA5142 IRB approved
  + Pathologic stage IIIA, II (IIA or IIB) or large IB (defined as size >= 4 cm); Note: IB tumors < 4cm are NOT eligible; stage IB cancer based on pleural invasion is not eligible unless the tumor size is >= 4cm
* Eastern Cooperative Oncology Group (ECOG) performance status 0-1
* No patients who have received neoadjuvant therapy (chemo- or radio-therapy) for this lung cancer
* No locally advanced or metastatic cancer requiring systemic therapy within 5 years prior to registration; no secondary primary lung cancer diagnosed concurrently or within 2 year prior to registration
* No prior treatment with agents targeting EGFR mutation, ALK rearrangement, and PD-1/PD-L1/CTLA-4
* No patients known to be pregnant or lactating
* Patients who have had local genotyping are eligible, regardless of the local result
* No patients with recurrence of lung cancer after prior resection
* Note: Post-surgical patients should proceed to registration immediately following preregistration
* PATIENT REGISTRATION ELIGIBILITY CRITERIA:
* Completely resected NSCLC with negative margins (R0); cancers with a histology of "adenosquamous" are considered a type of adenocarcinoma and thus a "nonsquamous" histology; patients with squamous cell carcinoma are eligible only if the registering site has EA5142 IRB approved
* Pathologic stage IIIA, IIA or IIB, or large IB (defined as size >= 4cm); Note: IB tumors < 4cm are NOT eligible; stage IB cancer based on pleural invasion is not eligible unless the tumor size is >= 4cm
* Tissue available for the required analyses (either clinical tissue block or slides and scrolls)
* In order to allow for time for central genotyping and eligibility for the ALCHEMIST treatment trial, patients must register within the following eligibility windows, depending on the adjuvant treatment approach:
  + If no adjuvant therapy, register patient within 75 days following surgery
  + If adjuvant chemotherapy or radiotherapy only, register patient within 225 days following surgery
  + If adjuvant chemotherapy and radiation, register patient within 285 days following surgery