FDA Expands Lilly’s ALIMTA® (pemetrexed) Label to Include Combination with KEYTRUDA® (pembrolizumab) and Carboplatin as First-Line Treatment for Metastatic Nonsquamous Non-Small Cell Lung Cancer, Irrespective of PD-L1 Expression

June 5, 2018

New approval based on KEYNOTE-021, Cohort G1, results

INDIANAPOLIS, June 5, 2018 /PRNewswire/ -- Eli Lilly and Company (NYSE: LLY) today announced that the U.S. Food and Drug Administration (FDA) has granted approval for a new indication for ALIMTA® (pemetrexed for injection) in combination with carboplatin and KEYTRUDA® (pembrolizumab) for the initial treatment of patients with metastatic nonsquamous non-small cell lung cancer (NSCLC), irrespective of PD-L1 expression status. Under the FDA’s accelerated approval regulations, this indication is approved based on tumor response rate and progression-free survival (PFS). Continued approval for this indication may be contingent upon verification and description of clinical benefit in the confirmatory trials.

Merck (known as MSD outside the U.S. and Canada) received accelerated approval for the combination of pembrolizumab with ALIMTA and carboplatin in May 2017. The combination is pembrolizumab plus carboplatin followed by ALIMTA, with pembrolizumab continued as single-agent maintenance therapy, for patients who progress on chemotherapy or have unacceptable toxicity. Merck’s KEYNOTE-021 study, Cohort G1, demonstrated pembrolizumab and carboplatin in combination with ALIMTA was effective for patients with advanced nonsquamous NSCLC and demonstrated a clinically meaningful benefit over previous standards of care. The KEYNOTE-021, Cohort G1, results were presented at the 2018 ASCO Annual Meeting.

"Lung cancer is the leading cause of cancer death in the U.S., and this approval represents the power of rational combinations and collaborations in bringing new treatments to these patients," said Sue Mahony, Ph.D., senior vice president and president of Lilly Oncology. "ALIMTA has been a long-standing, first-line treatment for locally advanced or metastatic nonsquamous non-small cell lung cancer. This combination with pembrolizumab continues to build on the robust body of evidence for ALIMTA in lung cancer."

The KEYNOTE-021, Part 2, Cohort G1, study included 123 previously untreated patients with locally advanced or metastatic nonsquamous NSCLC with no epidermal growth factor receptor (EGFR) or anaplastic lymphoma kinase (ALK) genomic tumor aberrations and irrespective of PD-L1 expression status. The triplet combination of ALIMTA and carboplatin with pembrolizumab (n=60) demonstrated a statistically significant improvement in objective response rate (ORR) versus ALIMTA plus carboplatin alone (n=63) (55% vs 29%; all responses were partial) (estimated difference, 26%; 95% confidence interval [CI], range of 42-68 for triplet and range of 18-41 for ALIMTA plus carboplatin; P=0.0032), and PFS (HR=0.53; 95% CI, 0.31-0.91, P=0.0205). Median PFS was 13.0 months for triplet and 8.9 months for ALIMTA plus carboplatin (range of 8.3-NE for triplet and 4.4-10.3 for ALIMTA plus carboplatin).

The labeling for ALIMTA contains warnings and precautions for myelosuppression and increased risk of myelosuppression without vitamin supplementation, renal failure, bullous and exfoliative skin toxicity, interstitial pneumonitis, radiation recall, increased risk of toxicity with ibuprofen in patients with renal impairment and also embryo-fetal toxicity. Initiate supplementation with oral folic acid and intramuscular vitamin B12 prior to and for 21 days after the last dose of ALIMTA. Determine creatinine clearance before each dose and periodically monitor renal function during treatment. Withhold ALIMTA in patients with a creatinine clearance of less than 45 mL/minute. The dosage of ALIMTA should be modified according to the full prescribing information when experiencing certain adverse reactions. The dosage of ibuprofen needs to be modified in patients with mild to moderate renal impairment receiving ALIMTA. Advise patients of the potential risk to a fetus and to use effective contraception. Please see Important Safety Information below and full Prescribing Information for more information.

About KEYNOTE-021

KEYNOTE-021, conducted by Merck, is a multi-cohort Phase 1/2 study evaluating the safety and preliminary efficacy of pembrolizumab with ALIMTA and carboplatin, immunotherapy or EGFR-targeted therapy for advanced nonsquamous NSCLC. Two of the eight cohorts included ALIMTA. Cohort G1 (n=123) is a Phase 2, randomized evaluation of the pembrolizumab-ALIMTA-carboplatin combination. The combination therapy is pembrolizumab at a fixed dose of 200 mg administered as an intravenous infusion over 30 minutes every three weeks in combination with ALIMTA 500 mg/m² administered as an IV infusion over 10 minutes every three weeks and carboplatin AUC 5 mg/mL/min every three weeks for four cycles.

In the KEYNOTE-021, Cohort G1, trial, safety was evaluated in 59 patients who received pembrolizumab with ALIMTA and carboplatin and 62 patients who received ALIMTA and carboplatin alone. KEYNOTE-021 was not designed to demonstrate a statistically significant difference in adverse reaction rates for pembrolizumab with ALIMTA and carboplatin, as compared to ALIMTA and carboplatin alone. ALIMTA was discontinued for adverse reactions in nine percent of patients receiving pembrolizumab with ALIMTA and carboplatin.

The most common adverse reaction resulting in discontinuation of ALIMTA (≥2%) was acute kidney injury (3.4%). Adverse reactions leading to interruption of ALIMTA occurred in 36 percent of patients; the most common (≥2%) were fatigue (9%), neutrophil count decreased (9%), anemia (7%), dyspnea (3.4%) and pneumonitis (3.4%).

About Lung Cancer

Lung cancer is the leading cause of cancer death in the U.S. and most other countries, killing nearly 1.6 million people worldwide each year.¹ In the U.S., lung cancer is responsible for approximately 26 percent of all cancer deaths, more than those from breast, colon and prostate cancers combined.² Stage IV NSCLC is a very difficult-to-treat cancer and the prognosis is poor for metastatic NSCLC.³ NSCLC is much more common than
other types of lung cancer and accounts for about 85 percent of all lung cancer cases. For those people afflicted with NSCLC, about 70 percent have nonsquamous cell carcinoma, while about 30 percent have squamous cell carcinoma. Approximately half of patients with metastatic NSCLC who begin first-line therapy will move on to second-line treatment. 

**About ALIMTA® (pemetrexed for injection)**

In 2004, ALIMTA received consecutive approvals: it was the first agent to be approved in combination with cisplatin as an initial treatment for patients with malignant pleural mesothelioma, whose disease is unresectable or who are otherwise not candidates for curative surgery, and then as a single agent for the treatment of patients with locally advanced or metastatic NSCLC after prior treatment.

In 2008, ALIMTA, in combination with cisplatin, was approved as an initial chemotherapy treatment for locally advanced or metastatic NSCLC for patients with nonsquamous histology. At the time of this initial treatment approval, the FDA also approved a change to the indication for subsequent treatment. As a result, ALIMTA was also indicated as a single agent for the treatment of patients with recurrent, metastatic nonsquamous NSCLC after prior therapy.

In 2009, ALIMTA was approved as a maintenance therapy for locally advanced or metastatic NSCLC, specifically for patients with a nonsquamous histology whose disease has not progressed after four cycles of platinum-based initial chemotherapy.

In 2012, ALIMTA was approved by the FDA as maintenance therapy for locally advanced or metastatic NSCLC, following initial ALIMTA-plus-cisplatin treatment for locally advanced or metastatic nonsquamous NSCLC.

In 2018, ALIMTA received an additional indication for the combination with carboplatin plus pembrolizumab in first-line treatment for metastatic nonsquamous NSCLC, irrespective of PD-L1 expression status. This approval was based on Merck's KEYNOTE-021, Cohort G1, study.

ALIMTA is not indicated for treatment of patients with squamous cell NSCLC.

**Indications for ALIMTA® (pemetrexed for injection)**

ALIMTA (pemetrexed for injection) is indicated in combination with cisplatin therapy for the initial treatment of patients with locally advanced or metastatic nonsquamous non-small cell lung cancer.

ALIMTA is indicated as a single agent for the maintenance treatment of patients with locally advanced or metastatic nonsquamous non-small cell lung cancer whose disease has not progressed after four cycles of platinum-based first-line chemotherapy.

ALIMTA is indicated as a single agent for the treatment of patients with recurrent, metastatic nonsquamous non-small cell lung cancer after prior chemotherapy.

ALIMTA is indicated in combination with carboplatin and pembrolizumab for the initial treatment of patients with metastatic nonsquamous non-small cell lung cancer. This indication is approved under accelerated approval based on tumor response rate and progression-free survival. Continued approval for this indication may be contingent upon verification and description of clinical benefit in the confirmatory trials.

**Limitation of Use:** ALIMTA is not indicated for the treatment of patients with squamous cell non-small cell lung cancer.

ALIMTA in combination with cisplatin is indicated for the initial treatment of patients with malignant pleural mesothelioma whose disease is unresectable or who are otherwise not candidates for curative surgery.

**IMPORTANT SAFETY INFORMATION FOR ALIMTA® (pemetrexed for injection)**

ALIMTA is contraindicated in patients who have a history of severe hypersensitivity reaction to pemetrexed.

ALIMTA can cause severe myelosuppression resulting in a requirement for transfusions and which may lead to neutropenic infection. The risk of myelosuppression is increased in patients who do not receive vitamin supplementation. Prior to treatment with ALIMTA, patients must be instructed to initiate supplementation with oral folic acid. Intramuscular injections of vitamin B12 are also required prior to ALIMTA treatment. Folic acid and vitamin B12 supplementation should be continued during treatment and for 21 days after the last dose of ALIMTA as they may reduce the severity of treatment-related hematologic and gastrointestinal toxicities. Obtain a complete blood count at the beginning of each cycle. Do not administer ALIMTA until the ANC is at least 1500 cells/mm³ and platelet count is at least 100,000 cells/mm³. Permanently reduce ALIMTA in patients with an ANC of less than 500 cells/mm³ or platelet count of less than 50,000 cells/mm³ in previous cycles. In Studies JMDB and JMCH, among patients who received vitamin supplementation, incidence of Grade 3-4 neutropenia was 15% and 23%, the incidence of Grade 3-4 anemia was 6% and 4%, and incidence of Grade 3-4 thrombocytopenia was 4% and 5%, respectively. In Study JMCH, 18% of patients in the ALIMTA arm required red blood cell transfusions compared to 7% of patients in the cisplatin arm. In Studies JMEM, PARAMOUNT, and JMEI, where all patients received vitamin supplementation, incidence of Grade 3-4 neutropenia ranged from 3% to 5%, and incidence of Grade 3-4 anemia ranged from 3% to 5%.

ALIMTA can cause severe, and sometimes fatal, renal toxicity. Determine creatinine clearance before each dose and periodically monitor renal function during treatment with ALIMTA. The incidences of renal failure in clinical studies in which patients received ALIMTA with cisplatin were: 2.1% in Study JMDB and 2.2% in Study JMCH. The incidence of renal failure in clinical studies in which patients received ALIMTA as a single agent ranged from 0.4% to 0.6% (Studies JMEM, PARAMOUNT, and JMEI). Withhold ALIMTA in patients with a creatinine clearance of less than 45 mL/min.

ALIMTA can cause serious and sometimes fatal, bullous, blistering and exfoliative skin toxicity, including cases suggestive of Stevens-Johnson Syndrome/Toxic epidermal necrolysis can occur with ALIMTA. Permanently discontinue ALIMTA for severe and life-threatening bullous, blistering or exfoliating skin toxicity.

Serious interstitial pneumonitis, including fatal cases, can occur with ALIMTA treatment. Withhold ALIMTA for acute onset of new or progressive unexplained pulmonary symptoms such as dyspnea, cough, or fever pending diagnostic evaluation. If pneumonitis is confirmed, permanently discontinue ALIMTA.

Radiation Recall can occur with ALIMTA in patients who have received radiation weeks to years previously. Monitor patients for inflammation or blistering in areas of previous radiation treatment. Permanently discontinue ALIMTA for signs of radiation recall.
Exposure to ALIMTA is increased in patients with mild to moderate renal impairment who take concomitant ibuprofen, increasing the risks of adverse reactions of ALIMTA. In patients with creatinine clearances between 45 mL/min and 79 mL/min, avoid administration of ibuprofen for 2 days before, the day of, and 2 days following administration of ALIMTA. If concomitant ibuprofen use cannot be avoided, monitor patients more frequently for ALIMTA adverse reactions, including myelosuppression, renal, and gastrointestinal toxicity.

Based on findings from animal studies and its mechanism of action, ALIMTA can cause fetal harm when administered to a pregnant woman. In animal reproduction studies, intravenous administration of pemetrexed to pregnant mice during the period of organogenesis was teratogenic, resulting in developmental delays and increased malformations at doses lower than the recommended human dose of 500 mg/m². Advise pregnant women of the potential risk to the fetus. Advise females of reproductive potential to use effective contraception during treatment with ALIMTA and for 6 months after the final dose. Advise males with female partners of reproductive potential to use effective contraception during treatment with ALIMTA and for 3 months after the final dose.

Ibuprofen increases exposure (AUC) of pemetrexed. In patients with creatinine clearance between 45 mL/min and 79 mL/min. Avoid administration of ibuprofen for 2 days before, the day of, and 2 days following administration of ALIMTA and monitor patients more frequently for myelosuppression, renal, and gastrointestinal toxicity, if concomitant administration of ibuprofen cannot be avoided.

The most severe adverse reactions (grades 3-4) occurring in fully vitamin supplemented patients with locally advanced or metastatic nonsquamous non-small cell lung cancer (NSCLC) receiving ALIMTA in combination with cisplatin versus gemcitabine in combination with cisplatin for initial treatment (JMDB), respectively, were neutropenia (15% vs 27%); fatigue (7% vs 5%); nausea (7% vs 4%); vomiting (6% vs 6%); anemia (6% vs 10%); thrombocytopenia (4% vs 13%); anorexia (2% vs 1%); creatinine elevation (1% vs 1%); diarrhea (1% vs 2%); stomatitis/pharyngitis (1% vs 0%); and constipation (1% vs 0%).

The most severe adverse reactions (grades 3-4) occurring in patients with non-progressive locally advanced or metastatic nonsquamous non-small cell lung cancer (NSCLC) receiving ALIMTA as a single agent versus placebo as maintenance treatment (JMEI), respectively, following non-ALIMTA containing platinum-based induction therapy were anemia (3% vs 1%); neutropenia (3% vs 0%); fatigue (5% vs 1%); nausea (1% vs 1%); anorexia (2% vs 0%); infection (2% vs 0%); mucositis/stomatitis (1% vs 0%); diarrhea (1% vs 0%); and sensory neuropathy (1% vs 0%).

The most severe adverse reactions (grades 3-4) occurring in patients with non-progressive locally advanced or metastatic nonsquamous non-small cell lung cancer (NSCLC) receiving ALIMTA as a single agent versus placebo as maintenance treatment (JMEN), respectively, following non-ALIMTA containing platinum-based induction therapy were fatigue (25% vs 11%); nausea (19% vs 6%); anorexia (19% vs 5%); anemia (15% vs 6%); increased rash/desquamation (10% vs 3%); ALT (10% vs 4%); sensory neuropathy (9% vs 4%); vomiting (9% vs 1%); increased AST (8% vs 4%); mucositis/stomatitis (7% vs 2%); neutropenia (6% vs 0%); diarrhea (5% vs 3%); and infection (5% vs 2%).

The most severe adverse reactions (grades 3-4) occurring in patients with non-progressive locally advanced or metastatic nonsquamous non-small cell lung cancer (NSCLC) receiving ALIMTA as a single agent versus placebo as maintenance treatment (PARAMOUNT), respectively, following ALIMTA plus cisplatin induction therapy were anemia (4.8% vs 0.6%); fatigue (4.5% vs 0.6%); neutropenia (3.9% vs 0%); nausea (0.3% vs 0%); and mucositis/stomatitis (0.3% vs 0%).

The most severe adverse reactions (grades 3-4) occurring in patients with non-progressive locally advanced or metastatic nonsquamous non-small cell lung cancer (NSCLC) receiving ALIMTA as a single agent versus placebo as maintenance treatment (JMEI), respectively, following non-ALIMTA containing platinum-based induction therapy were fatigue (18% vs 11%); anemia (15% vs 4.8%); nausea (12% vs 2.4%); neutropenia (9% vs 0.6%); vomiting (6% vs 1.8%); mucositis/stomatitis (5% vs 2.4%); and edema (5% vs 3.6%).

The most severe adverse reactions (grades 3-4) occurring in fully supplemented patients with recurrent metastatic nonsquamous non-small cell lung cancer (NSCLC) receiving ALIMTA as a single agent versus docetaxel as 2nd-line treatment after prior chemotherapy (JMEI), respectively, were neutropenia (5% vs 40%); fatigue (5% vs 5%); anemia (4% vs 4%); nausea (3% vs 2%); anorexia (2% vs 3%); vomiting (2% vs 1%); thrombocytopenia (2% vs 0%); increased ALT (2% vs 0%); increased AST (1% vs 0%); and stomatitis/pharyngitis (1% vs 1%).

The most severe adverse reactions (grades 3-4) occurring in patients with recurrent metastatic nonsquamous non-small cell lung cancer (NSCLC) receiving ALIMTA in combination with cisplatin versus cisplatin alone (JMCH), respectively, were neutropenia (23% vs 3%); nausea (12% vs 6%); vomiting (11% vs 4%); fatigue (10% vs 9%); thrombocytopenia (5% vs 0%); dehydration (4% vs 1%); anemia (4% vs 0%); diarrhea (4% vs 0%); stomatitis/pharyngitis (3% vs 0%); creatinine elevation (1% vs 1%); anorexia (1% vs 1%); constipation (1% vs 1%); dyspepsia (1% vs 0%); sensory neuropathy (0% vs 1%); rash (1% vs 0%); and creatinine clearance decrease (1% vs 2%).

The most severe adverse reactions (grades 3-4) occurring in the fully supplemented subgroup of patients with malignant pleural mesothelioma (MPM) receiving ALIMTA in combination with cisplatin versus cisplatin alone (JMCH), respectively, were nausea (82% vs 77%); vomiting (57% vs 50%); neutropenia (56% vs 13%); fatigue (48% vs 42%); anemia (26% vs 10%); thrombocytopenia (23% vs 9%); stomatitis/pharyngitis (23% vs 6%); anorexia (20% vs 14%); diarrhea (17% vs 8%); creatinine clearance decreased (16% vs 18%); rash (16% vs 5%); constipation (12% vs 7%); creatinine elevation (11% vs 10%); alopecia (11% vs 6%); sensory neuropathy (10% vs 10%); conjunctivitis (5% vs 1%); dyspepsia (5% vs 1%); dehydration (7% vs 1%); and taste disturbance (8% vs 6%).
The most severe adverse reactions (grades 3-4) occurring in patients with metastatic nonsquamous non-small cell lung cancer (NSCLC) receiving ALIMTA and carboplatin in combination with pembrolizumab versus ALIMTA and carboplatin for initial treatment (KEYNOTE-021), respectively, were fatigue (3.4% vs 0%); dyspnea (3.4% vs 0%); nausea (1.7% vs 0%); vomiting (1.7% vs 0%); diarrhea (1.7% vs 1.6%); rash (1.7% vs 1.6%); constipation (0% vs 1.6%); headache (0% vs 1.6%); and arthralgia (0% vs 1.6%).

The most common adverse reactions (all grades) occurring in patients with metastatic nonsquamous non-small cell lung cancer (NSCLC) receiving ALIMTA and carboplatin in combination with pembrolizumab versus ALIMTA and carboplatin for initial treatment (KEYNOTE-021), respectively, were fatigue (71% vs 50%); nausea (68% vs 56%); constipation (51% vs 37%); rash (42% vs 21%); vomiting (39% vs 27%); dyspnea (39% vs 21%); diarrhea (37% vs 23%); decreased appetite (31% vs 23%); headache (31% vs 16%); cough (24% vs 18%); dizziness (24% vs 16%); insomnia (24% vs 15%); pruritus (24% vs 4.8%); peripheral edema (22% vs 18%); dysgeusia (20% vs 11%); alopecia (20% vs 3.2%); upper respiratory tract infection (20% vs 3.2%) and arthralgia (15% vs 24%).

There is no information regarding the presence of pemetrexed or its metabolites in human milk, the effects on the breastfed infant, or the effects on milk production. Because of the potential for serious adverse reactions in breastfed infants from ALIMTA, advise women not to breastfeed during treatment with ALIMTA and for one week after last dose.

ALIMTA may impair fertility in males of reproductive potential. It is not known whether these effects on fertility are reversible.

The safety and effectiveness of ALIMTA in pediatric patients have not been established. Adverse reactions observed in pediatric patients studied were similar to those observed in adults.

ALIMTA is primarily excreted by the kidneys. Decreased renal function results in reduced clearance and greater exposure (AUC) to ALIMTA compared with patients with normal renal function. No dose is recommended for patients with creatinine clearance less than 45 mL/min.

The incidences of Grade 3-4 anemia, fatigue, thrombocytopenia, hypertension, and neutropenia were higher in patients 65 years of age and older as compared to younger patients: in at least one of five randomized clinical trials.

Please see full Prescribing Information.

PM_HCP_ISI_All_04-Jun-2018

About Lilly Oncology
For more than 50 years, Lilly has been dedicated to delivering life-changing medicines and support to people living with cancer and those who care for them. Lilly is determined to build on this heritage and continue making life better for all those affected by cancer around the world. To learn more about Lilly’s commitment to people with cancer, please visit www.LillyOncology.com.

About Eli Lilly and Company
Lilly is a global healthcare leader that unites caring with discovery to make life better for people around the world. We were founded more than a century ago by a man committed to creating high-quality medicines that meet real needs, and today we remain true to that mission in all our work. Across the globe, Lilly employees work to discover and bring life-changing medicines to those who need them, improve the understanding and management of disease, and give back to communities through philanthropy and volunteerism. To learn more about Lilly, please visit us at www.lilly.com and www.lilly.com/newsroom/social-channels. P-LLY

PP-PM-US-0487 06/2018 © Lilly USA, LLC 2018. ALL RIGHTS RESERVED.

ALIMTA® is a registered trademark owned by or licensed to Eli Lilly and Company, its subsidiaries, or affiliates.

KEYTRUDA® is a registered trademark of Merck Sharp & Dohme Corp., a subsidiary of Merck & Co., Inc.

Lilly Forward-Looking Statement
This press release contains forward-looking statements (as that term is defined in the Private Securities Litigation Reform Act of 1995) about ALIMTA as a potential treatment for patients with nonsquamous non-small cell lung cancer, and reflects Lilly’s current beliefs. However, as with any pharmaceutical product, there are substantial risks and uncertainties in the process of development and commercialization. Among other things, there can be no guarantee that ALIMTA will receive additional regulatory approvals or be commercially successful. For further discussion of these and other risks and uncertainties, see Lilly’s most recent Form 10-K and Form 10-Q filings with the United States Securities and Exchange Commission. Except as required by law, Lilly undertakes no duty to update forward-looking statements to reflect events after the date of this release.


Refer to: Tracy Henrikson; tracy.henrikson@lilly.com; 609-240-3902 (media)
Kevin Hern; hern_kevin_r@lilly.com; 317-277-1838 (investors)
FDA Expands Eli Lilly’s Alimta (Pemetrexed) Label to Include Combination with Keytruda (Pembrolizumab) and Carboplatin as First-Line Treatment for Metastatic Nonsquamous Non-Small-Cell Lung Cancer, Irrespective of PD-L1 Expression

SOURCE Eli Lilly and Company