

# GIOTRIF<sup>®</sup> (AFATINIB<sup>\*</sup>)

## BACKGROUND

1. What is Giotrif<sup>®</sup> (afatinib<sup>\*</sup>)?
2. How does Giotrif<sup>®</sup> (afatinib<sup>\*</sup>) work?
3. Data overview
4. Clinical potential
5. Giotrif<sup>®</sup> (afatinib<sup>\*</sup>) approval and reimbursement status

### 1. WHAT IS GIOTRIF<sup>®</sup> (AFATINIB<sup>\*</sup>)?

Afatinib<sup>\*</sup> is an irreversible ErbB Family Blocker approved in over 40 countries worldwide including the EU, US and Japan. It is indicated for the treatment of patients with distinct types of Epidermal Growth Factor Receptor (EGFR) mutation-positive locally advanced or metastatic non-small cell lung cancer (NSCLC), a specific type of lung cancer. It is an oral, once daily targeted therapy.

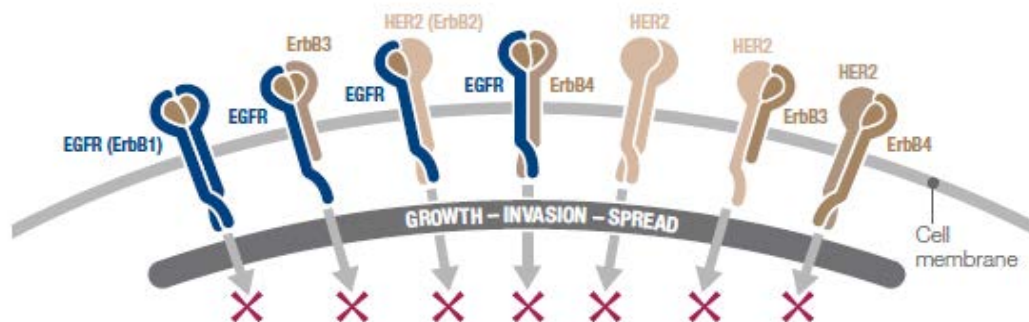
### 2. HOW DOES GIOTRIF<sup>®</sup> (AFATINIB<sup>\*</sup>) WORK?

The ErbB Family of receptors consists of four related enzymes called tyrosine kinases: EGFR (ErbB1), HER2 (ErbB2), ErbB3 and ErbB4.<sup>1</sup> These receptors are often over expressed (i.e. too many are produced) or mutated in many cancers (including lung, breast, head and neck, and colorectal cancers), and are involved in fundamental processes which allow tumour cells to grow and multiply.<sup>2</sup>

Afatinib<sup>\*</sup> irreversibly blocks EGFR (ErbB1) as well as other members of the ErbB Family that are known to play a critical role in the growth and spread of the most widespread cancers and cancers associated with high mortality (death).

The irreversible binding of afatinib<sup>\*</sup> is unlike other compounds which are reversible in that it aims to provide a sustained, selective and complete ErbB Family Blockade. Afatinib's<sup>\*</sup> mechanism of action could potentially lead to a greater overall effect on the tumour, preventing tumour cell growth and spread across a broad range of cancers, compared to other treatments which offer single, reversible, receptor blocking.<sup>3,4</sup>

#### Signal Transduction



The signalling of ErbB3 is blocked indirectly through blocking of transphosphorylation  
Source: Hynes NE, et al. Nat Rev Cancer 2005;5:341-54.

\*Afatinib is approved in a number of markets, including the EU, Japan, Taiwan and Canada under the brand name Giotrif<sup>®</sup> and in the US under the brand name Gilotrif<sup>®</sup> for use in patients with distinct types of EGFR mutation-positive NSCLC. Afatinib is under regulatory review by health authorities in other countries worldwide. Afatinib is not approved in other indications.

# GIOTRIF<sup>®</sup> (AFATINIB<sup>\*</sup>)

## BACKGROUND

### 3. DATA OVERVIEW

#### LUX-Lung Clinical Trial Programme

The LUX-Lung clinical trial programme comprises eight studies, investigating afatinib<sup>\*</sup> in a number of patient populations with advanced NSCLC.

Two pivotal Phase III studies, LUX-Lung 3<sup>5,6</sup> and LUX-Lung 6<sup>7,8</sup> represent the largest and most robust clinical trial programme in EGFR mutation-positive NSCLC to date.

LUX-Lung 5<sup>9</sup> is the first prospective trial looking at the advantage of continuing treatment with afatinib<sup>\*</sup>, in combination with chemotherapy in NSCLC, after the tumour started to grow on afatinib<sup>\*</sup> alone (treatment beyond progression).

LUX-Lung 8 is the first trial to directly compare the efficacy of two EGFR targeting compounds in patients with advanced squamous cell carcinoma (SCC) of the lung.<sup>10</sup>

In addition to NSCLC, afatinib<sup>\*</sup> is being investigated in another disease area, head and neck cancer. LUX-Head & Neck 1 is a Phase III study evaluating the efficacy and safety of afatinib<sup>\*</sup> in patients with recurrent and/or metastatic head and neck squamous cell cancer (HNSCC) versus methotrexate (a chemotherapy) following failure of their previous treatment.<sup>11</sup> This study is part of the LUX-Head & Neck clinical trial programme investigating afatinib<sup>\*</sup> in different settings of head and neck squamous cell cancer.

#### Efficacy and Safety Profile

LUX-Lung 3 and LUX-Lung 6 are multicentre, randomised, open-label, Phase III trials of afatinib<sup>\*</sup> versus chemotherapy (pemetrexed/cisplatin and gemcitabine/cisplatin respectively) as first-line treatment for patients with advanced and metastatic NSCLC with an EGFR mutation.<sup>5,6,7,8</sup>

Both trials met their primary endpoint of progression-free survival, as afatinib<sup>\*</sup> significantly delayed tumour growth when compared to standard chemotherapy in patients with EGFR mutation-positive NSCLC.<sup>5,6,7,8</sup>

In a pre-specified subgroup analysis, LUX-Lung 3 and LUX-Lung 6 independently demonstrated that afatinib<sup>\*</sup> is the first treatment to show an overall survival benefit for patients with the most common type of EGFR mutation (exon 19 deletion/del19). These patients lived a median of more than one year longer if they started treatment with afatinib<sup>\*</sup> rather than standard chemotherapy.<sup>12</sup>

A combined exploratory analysis of the LUX-Lung 3 and LUX-Lung 6 trials demonstrated that afatinib<sup>\*</sup> offered an overall survival benefit to patients whose tumours harbour common EGFR mutations (del19/L858R), who lived for a median of 3 months longer when compared with standard chemotherapy.<sup>12</sup>

\*Afatinib is approved in a number of markets, including the EU, Japan, Taiwan and Canada under the brand name GIOTRIF<sup>®</sup> and in the US under the brand name GILOTRIF<sup>®</sup> for use in patients with distinct types of EGFR mutation-positive NSCLC. Afatinib is under regulatory review by health authorities in other countries worldwide. Afatinib is not approved in other indications.

# GIOTRIF<sup>®</sup> (AFATINIB\*)

## BACKGROUND

LUX-Lung 3 <sup>5,6</sup> (afatinib* vs pemetrexed/cisplatin)	LUX-Lung 6 <sup>7,8</sup> (afatinib* vs gemcitabine/cisplatin)
<b>Progression-Free Survival<sup>6,8</sup></b> (PFS – length of time before a tumour starts to progress, primary endpoint)	
<ul style="list-style-type: none"> <li><b>11.1 months vs. 6.9 months</b> for all patients with EGFR mutations by independent review (p=0.001)</li> <li><b>13.6 months vs. 6.9 months</b> for patients with <b>the most common mutations</b> (~89% of all patients, del19 and L858R) by independent review (p=0.001)</li> </ul>	<ul style="list-style-type: none"> <li><b>11.0 months vs. 5.6 months</b> for all patients with EGFR mutations by independent review (p&lt;0.0001)</li> <li>Based on investigator review patients lived for <b>well over a year</b> before their tumour started to grow again, versus just under half a year for those on standard chemotherapy (<b>PFS of 13.7 months vs. 5.6 months, p&lt;0.0001</b>)</li> <li>In addition, <b>47% of afatinib*-treated patients are alive and progression-free after 1 year of treatment compared to only 2% on chemotherapy</b></li> </ul>
<ul style="list-style-type: none"> <li>The delay in tumour growth compared well in both trials, substantiating the efficacy of afatinib* and the robustness of the data</li> </ul>	
<b>Overall Survival (OS: length of time a patient lives for, secondary endpoint)<sup>12</sup></b>	
<ul style="list-style-type: none"> <li>Statistically significant improvement in <b>overall survival, in patients with common mutations (del19/L858R)</b>, with afatinib* compared to chemotherapy (<b>median 27.3 vs. 24.4 months, p=0.037</b>) in the post-hoc analysis combining LUX-Lung 3 and LUX-Lung 6</li> <li>More than one year overall survival benefit (median 33.3 vs. 21.1 months, p=0.0015) in patients with the del19 mutation compared to chemotherapy in the pre-specified subgroup analysis of LL3</li> <li>More than one year overall survival benefit (median 31.4 vs. 18.4 months, p=0.0229) in patients with the del19 mutation compared to chemotherapy in the pre-specified subgroup analysis of LL6</li> <li><i>In the overall patient population for each individual study, there was no significant overall survival benefit of afatinib* compared with chemotherapy (28.16 vs. 28.22 months for LUX-Lung 3 and 23.1 vs. 23.5 months for LUX-Lung 6)</i></li> </ul>	
<b>Objective Response<sup>6,7</sup></b> (Tumour shrinkage, secondary endpoint)	
<ul style="list-style-type: none"> <li><b>One in two patients (56%) taking afatinib* experienced tumour shrinkage compared to one in four (23%) in the chemotherapy arm</b>, by independent review (p&lt;0.001)</li> </ul>	<ul style="list-style-type: none"> <li><b>In 67% of patients taking afatinib* the tumour shrunk significantly in size compared to 23% in the chemotherapy arm</b>, by independent review (p&lt;0.0001)</li> </ul>
<ul style="list-style-type: none"> <li>Tumour shrinkage translated into improvements in disease-related symptoms</li> </ul>	
<b>Disease Related Symptoms<sup>5,8</sup></b> (secondary endpoint)	
<ul style="list-style-type: none"> <li>In LUX-Lung 3 and LUX-Lung 6, more patients taking afatinib* <b>experienced improvement of symptoms such as dyspnoea (shortness of breath), cough and chest pain</b>. Afatinib* treatment also delayed the onset of these symptoms</li> </ul>	
<b>Quality of Life</b> (Measured by patient questionnaires, secondary endpoint) <sup>5,8</sup>	
<ul style="list-style-type: none"> <li>Afatinib* patients in LUX-Lung 3 and LUX-Lung 6 reported to have <b>a significantly better quality of life</b> than those on chemotherapy (LUX-Lung 3, p=0.015; LUX-Lung 6, p&lt;0.0001)</li> </ul>	
<b>Grade ≥3 Adverse Events (AEs)<sup>6,7</sup></b>	

\*Afatinib is approved in a number of markets, including the EU, Japan, Taiwan and Canada under the brand name GIOTRIF<sup>®</sup> and in the US under the brand name GILOTRIF<sup>®</sup> for use in patients with distinct types of EGFR mutation-positive NSCLC. Afatinib is under regulatory review by health authorities in other countries worldwide. Afatinib is not approved in other indications.

# GIOTRIF<sup>®</sup> (AFATINIB<sup>\*</sup>)

## BACKGROUND

- The most common drug-related AEs observed in the afatinib<sup>\*</sup> treatment arm were diarrhoea, rash and paronychia (infection of the skin next to the nail)
- The most common drug-related AEs observed in the chemotherapy arm were nausea/vomiting, decreased appetite, and fatigue
- There was a low discontinuation rate associated with treatment-related AEs in the trial (**8% discontinuation rate for afatinib<sup>\*</sup>; 12% for chemotherapy**)
- **1% of patients in the afatinib<sup>\*</sup> arm discontinued treatment due to diarrhoea**
- The most common drug-related AEs associated with afatinib<sup>\*</sup> were diarrhoea, rash/acne and stomatitis/mucositis (inflammation of mouth and throat)
- The most common AEs associated with chemotherapy were neutropenia (an abnormally low level of neutrophils, a type of white blood cell), vomiting and leukopenia (a decrease in the number of white blood cells)
- The discontinuation rate due to AEs was **6% of patients on the afatinib<sup>\*</sup> arm and 40% of patients on the chemotherapy arm**
- **Only 2% discontinued due to rash/acne and none for diarrhoea**

LUX-Lung 5 is a randomised, open label Phase III trial comparing afatinib<sup>\*</sup> with chemotherapy versus chemotherapy alone in patients with late-stage lung cancer after failure of several treatments, including chemotherapy, erlotinib or gefitinib, and afatinib<sup>\*</sup> alone (treatment beyond progression).<sup>9</sup>

Those patients who continued afatinib<sup>\*</sup> treatment, with the addition of chemotherapy, after progressing on afatinib<sup>\*</sup> alone, had a further delay in tumour growth compared to the group who stopped afatinib<sup>\*</sup> treatment, and received chemotherapy only (tumour growth was delayed by 5.6 months and 2.8 months respectively). This corresponded to a 40% reduction in risk of disease progression.<sup>9</sup>

LUX-Lung 5 <sup>9</sup> (afatinib <sup>*</sup> + paclitaxel vs investigators choice of chemotherapy)
<b>Progression-Free Survival (PFS – length of time before tumour starts to progress, primary endpoint)</b>
• <b>5.6 months vs. 2.8 months (statistically significant, p=0.003)</b>
<b>Objective Response (Tumour shrinkage, secondary endpoint)</b>
• Almost <b>a third of patients (32.1%)</b> taking afatinib <sup>*</sup> experienced tumour shrinkage compared to <b>13.2%</b> in the chemotherapy arm (p=0.005)
• Tumour shrinkage translated into improvements in disease-related symptoms
<b>Overall survival (OS: length of time patients live for, secondary endpoint)</b>
• OS was similar in both arms <b>12.2 vs. 12.2 months</b>
<b>Adverse Events (AEs)</b>
• The most common drug-related AEs observed in the afatinib <sup>*</sup> treatment arm were diarrhoea, alopecia (hair loss) asthenia (a condition in which the body lacks or has lost strength either as a whole or in any of its parts)

<sup>\*</sup>Afatinib is approved in a number of markets, including the EU, Japan, Taiwan and Canada under the brand name GIOTRIF<sup>®</sup> and in the US under the brand name GILOTRIF<sup>®</sup> for use in patients with distinct types of EGFR mutation-positive NSCLC. Afatinib is under regulatory review by health authorities in other countries worldwide. Afatinib is not approved in other indications.

# GIOTRIF<sup>®</sup> (AFATINIB\*)

## BACKGROUND

LUX-Lung 8 is the first trial to compare two different EGFR targeting compounds in patients with advanced SCC of the lung.<sup>10</sup>

Results demonstrated superior progression-free survival for afatinib\* compared to erlotinib, in patients with advanced SCC of the lung after failure of first-line, platinum based chemotherapy; reducing the risk of disease progression by 18%.<sup>10</sup>

LUX-Lung 8 <sup>10</sup> (afatinib* vs erlotinib)
<b>Progression-Free Survival (PFS – length of time before tumour starts to progress, primary endpoint)</b>
<ul style="list-style-type: none"><li>2.4 months vs. 1.9 months (statistically significant, p=0.043 by independent review)</li></ul>
<b>Objective Response Rate (ORR – percentage of patients who achieved a partial or complete response to therapy, secondary endpoint)</b>
<ul style="list-style-type: none"><li>4.8% vs. 3.0% (numerical difference)</li></ul>
<b>Disease Control Rate (DCR – the percentage of patients who achieved complete response, partial response and stable disease, secondary endpoint)</b>
<ul style="list-style-type: none"><li>45.7% vs. 36.8% (statistically significant, p=0.020)</li></ul>
<b>Quality of Life (Measured by patient questionnaires, secondary endpoint)</b>
<ul style="list-style-type: none"><li>Favourable trends were noted in <b>delaying the worsening of lung cancer symptoms and global health status/quality of life</b>. The proportion of patients reporting improvement in cough (p=0.01) and global health status/quality of life (p=0.026) was significantly higher with afatinib* versus erlotinib</li></ul>
<b>Overall survival (OS: length of time patients live for, secondary endpoint)</b>
<ul style="list-style-type: none"><li>Data not mature yet, will be assessed at a later stage in the trial and reported at a future medical congress</li></ul>
<b>Adverse Events (AEs)</b>
<ul style="list-style-type: none"><li>The overall rate of severe (≥grade 3) and serious adverse events was comparable between both therapies. Incidence of severe adverse events (≥ grade 3) was 50.2% in patients treated with afatinib* compared to 49.1% with erlotinib. A higher incidence of ≥ grade 3 diarrhoea and stomatitis were observed in patients treated with afatinib* compared to erlotinib (≥ grade 3 diarrhoea: 9% vs. 2%; stomatitis: 3% vs. 0%), while there was a higher incidence of ≥ grade 3 rash/acne observed with erlotinib compared to afatinib* (9% vs. 6%).</li></ul>

Results from LUX-Head & Neck 1 showed that afatinib\* is the first tyrosine-kinase inhibitor (TKI) to significantly delay tumour growth versus chemotherapy in patients with recurrent and/or metastatic head and neck squamous cell cancer following failure of their previous therapy.<sup>11</sup>

Patients taking afatinib\* experienced a significant delay in tumour growth of 2.6 months versus 1.7 months with chemotherapy which translated into a 20% reduction in risk of disease progression.<sup>11</sup>

\*Afatinib is approved in a number of markets, including the EU, Japan, Taiwan and Canada under the brand name GIOTRIF<sup>®</sup> and in the US under the brand name GILOTRIF<sup>®</sup> for use in patients with distinct types of EGFR mutation-positive NSCLC. Afatinib is under regulatory review by health authorities in other countries worldwide. Afatinib is not approved in other indications.

# GIOTRIF<sup>®</sup> (AFATINIB<sup>\*</sup>)

## BACKGROUND

LUX-Head & Neck 1 <sup>11</sup> (afatinib <sup>*</sup> vs methotrexate – a chemotherapy)
<b>Progression-Free Survival (PFS</b> – length of time before tumour starts to progress, primary endpoint)
<ul style="list-style-type: none"><li><b>2.6 months vs. 1.7 months (statistically significant, p=0.030)</b></li></ul>
<b>Objective Response</b> (Tumour shrinkage, secondary endpoint)
<ul style="list-style-type: none"><li>Tumour shrinkage was observed in <b>34.8%</b> of patients in the afatinib<sup>*</sup> arm compared to <b>22.3%</b> of patients in the chemotherapy arm</li></ul>
<b>Objective Response Rate (ORR</b> – percentage of patients who achieved a partial or complete response to therapy, secondary endpoint)
<ul style="list-style-type: none"><li><b>10.2% vs. 5.6% (numerical difference)</b></li></ul>
<b>Disease Control Rate (DCR</b> – the percentage of patients who achieved complete response, partial response and stable disease, secondary endpoint)
<ul style="list-style-type: none"><li><b>49.1% vs. 38.5% (statistically significant, p=0.035)</b></li></ul>
<b>Disease Related Symptoms</b> (secondary endpoint)
<ul style="list-style-type: none"><li>In quality-of-life questionnaires, patients taking afatinib<sup>*</sup> reported significantly less pain and a delay in time to worsening of symptoms including pain, swallowing and global health status (overall health and quality of life), when compared to chemotherapy</li></ul>
<b>Overall survival (OS:</b> length of time patients live for, secondary endpoint)
<ul style="list-style-type: none"><li>No significant difference between afatinib<sup>*</sup> and chemotherapy was observed (median 6.8 vs. 6.2 months)</li></ul>
<b>Adverse Events (AEs)</b>
<ul style="list-style-type: none"><li>The most frequent drug-related severe adverse events (≥ grade 3) were rash/acne (9.7%) and diarrhoea (9.4%) with afatinib<sup>*</sup>, and leukopenia (15.6%) and stomatitis (8.1%) with chemotherapy. The most common side effects in patients treated with afatinib<sup>*</sup> compared to chemotherapy were rash/acne (74.4% vs. 8.1%), diarrhoea (72.2% vs. 11.9%) and paronychia (nail infection) (14.4% vs. 0%), and with chemotherapy compared to afatinib<sup>*</sup> were stomatitis (43.1% vs. 39.1%), fatigue (31.9% vs. 24.7%) and nausea (22.5% vs. 20.0%). There were fewer drug-related dose reductions and discontinuations for patients taking afatinib<sup>*</sup> compared to chemotherapy.</li></ul>

## Tolerability

The side effects of afatinib<sup>\*</sup> are predictable, generally manageable and reversible. In studies to date, drug-related adverse events were largely related to the gastrointestinal tract (diarrhoea) and skin disorders (rash), which is in line with EGFR tyrosine-kinase inhibition.<sup>5-18</sup> For further details, please refer to the adverse events section in each of the above studies (LUX-Lung 3, 5, 6, 8 and LUX-Head and Neck 1).

<sup>\*</sup>Afatinib is approved in a number of markets, including the EU, Japan, Taiwan and Canada under the brand name GIOTRIF<sup>®</sup> and in the US under the brand name GILOTRIF<sup>®</sup> for use in patients with distinct types of EGFR mutation-positive NSCLC. Afatinib is under regulatory review by health authorities in other countries worldwide. Afatinib is not approved in other indications.

# GIOTRIF<sup>®</sup> (AFATINIB<sup>\*</sup>)

## BACKGROUND

### 4. CLINICAL POTENTIAL

The irreversible binding properties of afatinib\* and its selective and irreversible ErbB Family Blockade, may provide benefits and broaden potential indications in many cancers. Phase III trials in squamous head and neck cancer (HNSCC) indications and investigations in other tumour types are ongoing.

The positive results from LUX-Lung 3 and LUX-Lung 6 showcase the growing evidence of the superiority of afatinib\* over standard of care chemotherapy. The consistent results substantiate the robust efficacy and safety profile of afatinib\*, and reinforce confidence in the data.<sup>5,6,7,8</sup>

More recent study results have supported the clinical potential of afatinib\*. LUX-Lung 8 directly compared the efficacy and safety of two different targeted agents in patients with advanced SCC of the lung and demonstrated superior progression-free survival of afatinib\* compared to erlotinib.<sup>10</sup> Results from LUX-Head & Neck 1 confirm afatinib's\* efficacy in patients with recurrent/metastatic HNSCC and data are encouraging for the ongoing pivotal LUX-Head & Neck clinical trial programme investigating afatinib\* in different settings.<sup>11</sup>

The study programme evaluating afatinib\* in these indications and beyond will provide more clinical data in order to further establish the efficacy and safety profile of this compound demonstrated in earlier studies.

### 5. GIOTRIF<sup>®</sup> (AFATINIB<sup>\*</sup>) APPROVAL AND REIMBURSEMENT STATUS

Afatinib\* is approved for use in Europe and the following countries:

Australia	Argentina	Canada	Chile
Ecuador	El Salvador	Israel	Japan
Korea	Malaysia	Mexico	Paraguay
Peru	Russia	Serbia	Singapore
Switzerland	Taiwan	Uruguay	USA

Afatinib\* is reimbursed in the following countries: Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Israel, Japan, Luxemburg, Netherlands, Slovakia, Spain, Sweden, Switzerland, Taiwan, UK and USA.

\*Afatinib is approved in a number of markets, including the EU, Japan, Taiwan and Canada under the brand name GIOTRIF<sup>®</sup> and in the US under the brand name GILOTRIF<sup>®</sup> for use in patients with distinct types of EGFR mutation-positive NSCLC. Afatinib is under regulatory review by health authorities in other countries worldwide. Afatinib is not approved in other indications.

# GIOTRIF<sup>®</sup> (AFATINIB\*)

## BACKGROUND

### REFERENCES

1. Hynes NE, Lane HA. ERBB receptors and cancer: the complexity of targeted inhibitors. *Nat Rev Cancer* 2005;5:341-54.
2. Hynes NE, MacDonald G. ErbB receptors and signalling pathways in cancer. *Curr Opin Cell Biol* 2009; 21:177-84.
3. Reid A, Vidal L, Shaw H, do Bono J. Dual inhibition of ErbB1 (EGFR/HER1) and ErbB2 (HER2/neu). *Eur J Cancer* 2007;43:481-9.
4. Solca F, Dahl G, Zoepfel A, et al. Target binding properties and cellular activity of afatinib (BIBW 2992), an irreversible ErbB family blocker. *J Pharmacol Exp Ther* 2012;343:342-50.
5. Yang J, Hirsh V, Schuler M, et al. Symptom Control and Quality of Life in LUX-Lung 3: A Phase III Study of Afatinib or Cisplatin/Pemetrexed in Patients With Advanced Lung Adenocarcinoma With Epidermal Growth Factor Receptor Mutations. *J Clin Oncol* 2013;DOI: 10.1200/JCO.2012.46.1764.
6. Sequist L, Yang J, Yamamoto N, et al. Phase III Study of afatinib or Cisplatin Plus Pemetrexed in Patients With Metastatic Lung Adenocarcinoma With Epidermal Growth Factor Receptor Mutations. *J Clin Oncol* 2013;DOI: 10.1200/JCO.2012.44.2806.
7. Wu, Y., MD. LUX-Lung 6: A randomized, open-label, Phase III study of afatinib (A) vs. gemcitabine/cisplatin (GC) as first-line treatment for Asian patients (pts.) with EGFR mutation-positive (EGFR M+) advanced adenocarcinoma of the lung. (Abstract #8016) at American Society of Clinical Oncology, Chicago, June 2, 2013.
8. Geater, SL, MD. LUX-Lung 6: Patient reported outcomes (PROs) from a randomized open-label, Phase III study in 1st-line advanced NSCLC patients (pts.) harbouring epidermal growth factor receptor (EGFR) mutations. Poster (Abstract #8061) at American Society of Clinical Oncology, Chicago, June 1, 2013.
9. Schuler M, Chih-Hsin Yang J et al. Continuation of afatinib beyond progression: Results of a randomized, open-label, Phase III trial of afatinib plus paclitaxel versus investigator's choice chemotherapy in patients with metastatic non-small-cell lung cancer (NSCLC) progressed on erlotinib/ gefitinib and afatinib: LUX-Lung 5. (Abstract #8019) at 2014 American Society of Clinical Oncology, 50th ASCO Annual Meeting, 30 May-3 June 2014, Chicago, IL, USA.
10. Goss GD, Felip E, Cobo M, et al., A randomized, open-label, phase III trial of afatinib (A) vs erlotinib (E) as second-line treatment of patients (pts) with advanced squamous cell carcinoma (SCC) of the lung following first-line platinum-based chemotherapy: LUX-Lung 8 (LL8). Abstract #1222O presented at the European Society for Medical Oncology (ESMO) 2014 Congress, Madrid, Spain. 26 – 30 September 2014.
11. Machiels JPH, Haddad RI, Fayette J., et al. Afatinib versus methotrexate (MTX) as second-line treatment for patients with recurrent and/or metastatic (R/M) head and neck squamous cell carcinoma (HNSCC) who progressed after platinum-based therapy: primary efficacy results of LUX-Head & Neck 1, a phase III trial. Abstract # LBA 29 presented at the European Society for Medical Oncology (ESMO) 2014 Congress, Madrid, Spain. 26 – 30 September 2014.
12. Yang J, Sequist L et al. Overall survival (OS) In patients with advanced non-small cell lung cancer (NSCLC) harbouring common (Del19/L858R) Epidermal Growth Factor Receptor mutations (EGFR mut): pooled analysis of two large open-label phase III studies (LUX-Lung 3 [LL3] and LUX-Lung 6 [LL6] comparing afatinib\*with chemotherapy. (Abstract #8004) at 2014 American Society of Clinical Oncology, 50th ASCO Annual Meeting, 30 May-3 June 2014, Chicago, IL, USA.
13. Plummer R, Vidal L, Li L, et al. Phase I study of BIBW2992, an oral irreversible dual EGFR/HER2 inhibitor, showing activity in tumours with mutated EGFR. *Eur J Cancer Suppl* 2006;4(12):173-4 (Abstract 573).
14. Agus DB, Terlizzi E, Stopfer P, et al. A Phase I dose escalation study of BIBW 2992, an irreversible dual EGFR/HER2 receptor tyrosine kinase inhibitor, in a continuous schedule in patients with advanced solid tumors. *J Clin Oncol* 2006;24(18,Suppl):Abstract 2074.
15. Mom CH, Eskens FA, Gietema JA, et al. Phase 1 study with BIBW 2992, an irreversible dual tyrosine kinase inhibitor of Epidermal Growth Factor Receptor 1 (EGFR) and 2 (HER2) in a 2 week on 2 week off schedule. *J Clin Oncol* 2006;24(18,Suppl):Abstract 3025.
16. Shaw H, Plummer R, Vidal I, et al. phase I dose escalation study of BIBW 2992, an irreversible dual EGFR/HER2 receptor tyrosine kinase inhibitor, in patients with advanced solid tumours. *J Clin Oncol* 2006;24(18,Suppl):Abstract 3027.
17. Eskens FA, Mom CH, Planting AS, et al. A Phase I dose escalation study of BIBW 2992, an irreversible tyrosine kinase inhibitor of epidermal growth factor receptor 1 (EGFR-1) and 2 (HER 2) in a 2 week on 2 week off schedule in patients with advanced solid tumors. Poster A235 presented at AACR-NCI-EORTC International Conference on Molecular Targets and Cancer Therapeutics, Philadelphia, PA, USA, 14-18 November 2005.
18. Marshall JL, Lewis NL, Amelsberg A, et al. A Phase I dose escalation study of BIBW 2992, an irreversible dual EGFR/HER2 receptor tyrosine kinase inhibitor, in a 3 week on 1 week off schedule in patients with advanced solid tumors. Poster B161 presented at AACR-NCI-EORTC International Conference on Molecular Targets and Cancer Therapeutics, Philadelphia, PA, USA, 14-18 November 2005.

\*Afatinib is approved in a number of markets, including the EU, Japan, Taiwan and Canada under the brand name Giotrif<sup>®</sup> and in the US under the brand name GILOTRIF<sup>®</sup> for use in patients with distinct types of EGFR mutation-positive NSCLC. Afatinib is under regulatory review by health authorities in other countries worldwide. Afatinib is not approved in other indications.