Product Data Sheet

Chemical Properties

**Product Name:** Afatinib (BIBW2992)

**Cas No.:** 439081-18-2

**M.Wt:** 485.94

**Formula:** C24H25ClFN5O3

**Chemical Name:** (E)-N-[4-(3-chloro-4-fluoroanilino)-7-[(3S)-oxolan-3-yl]oxyquinazolin-6-yl]-4-(dimethylamino)but-2-enamide

**Canonical SMILES:** CN(C)CC=CC(=O)NC1=C(C=C2C≡C(=O)NC=N2)NC3=CC(=C(C=C3)F)ClOC4CCOC4

**Solubility:** \( \geq 24.3 \text{mg/mL} \) in DMSO

**Storage:** Store at \(-20^\circ \text{C}\)

**General tips:** For obtaining a higher solubility, please warm the tube at \(37^\circ \text{C}\) and shake it in the ultrasonic bath for a while. Stock solution can be stored below \(-20^\circ \text{C}\) for several months.

**Shopping Condition:**
- Evaluation sample solution: ship with blue ice
- All other available size: ship with RT, or blue ice upon request

Biological Activity

**Targets:** JAK/STAT Signaling

**Pathways:** EGFR

**Description:**

Afatinib (BIBW2992), an irreversible inhibitor of the ErbB family of tyrosine kinases, downregulates ErbB signalling by binding to the kinase domains of epidermal growth factor receptor (EGFR)/human epidermal growth factor receptor 2 (HER2) with IC50 of 0.5 nM and 14 nM, respectively.

The ErbB receptor tyrosine kinase family consists of four cell surface receptors: ErbB1/EGFR/HER1, ErbB2/HER2, ErbB3/HER3, and ErbB4/HER4. It has been shown that EGFR and HER2
Afatinib was shown to suppress EGF-induced phosphorylation of EGFR and cell proliferation in a variety of EGFR-overexpressing and HER2-expressing cell lines such as A431, NIH-3T3-HER2, NCI-N87 and BT-474 [1]. The component has also been used extensively in various animal models to study the role of EGFR/HER2. Oral administration of afatinib inhibited cancer cell growth and survival and suppress the tumor regression in xenograft and transgenic lung cancer models [2]. In addition, afatinib is identified as EGFR blocker which was approved for the treatment of patients with EGFR-mutated nonsmall cell lung cancer [3].

Reference:

Protocol

**Cell experiment:**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cell lines</strong></td>
<td>NCI-H1975 and BT474 cells</td>
</tr>
<tr>
<td><strong>Preparation method</strong></td>
<td>The solubility of this compound in DMSO is &gt;10 mM. General tips for obtaining a higher concentration: Please warm the tube at 37 °C for 10 minutes and/or shake it in the ultrasonic bath for a while. Stock solution can be stored below -20°C for several months.</td>
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<tr>
<td><strong>Reacting conditions</strong></td>
<td>EC50: 92 nM for NCI-H1975 cells, 54 nM for BT474 cells; 96 hours</td>
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<td><strong>Applications</strong></td>
<td>The effect of the inhibitor on cellular proliferation was tested in various assay formats including anchorage-dependent (BT474 cells grown on plastic; two-dimensional assays) and anchorage-independent (NCI-H1975 cells grown in soft agar; three-dimensional assays) assays. Afatinib dose-dependently inhibited cell proliferation and showed nanomolar activity. The EC50 values for NCI-H1975 and BT474 cells were 92 nM and 54 nM, respectively.</td>
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</tbody>
</table>
Animal experiment [3]:

Animal models
Transgenic mice expressing the delE748-A752 version of mouse Egfr and the L858R version of human EGFR

Dosage form
Oral administration, 5 mg/kg, once daily, 5 days per week

Applications
The transgenic mice received the oral administration of the drug until toxicity or death. All mice in the control group died, with a median survival time of 119 days. Afatinib treatment significantly enhanced the survival of transgenic mice with a median survival time of 456 days. No toxic death was observed in any mice. Four weeks after the initiation of treatment, body weight in the control group was significantly lower than in the afatinib group.

Other notes
Please test the solubility of all compounds indoor, and the actual solubility may slightly differ with the theoretical value. This is caused by an experimental system error and it is normal.

Reference:

Product Citations

Caution

FOR RESEARCH PURPOSES ONLY.

NOT FOR HUMAN, VETERINARY DIAGNOSTIC OR THERAPEUTIC USE.

Specific storage and handling information for each product is indicated on the product datasheet. Most ApexBio products are stable under the recommended conditions. Products are sometimes shipped at a temperature that differs from the recommended storage temperature. Shortterm storage of many products are stable in the short-term at temperatures that differ from that required for long-term storage. We ensure that the product is shipped under conditions that will
maintain the quality of the reagents. Upon receipt of the product, follow the storage recommendations on the product data sheet.