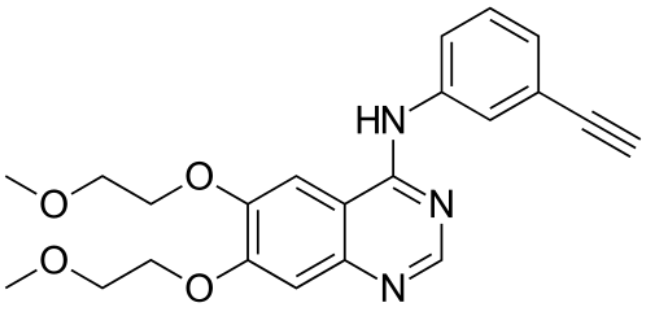
Brand Name: Tarceva
Generic: erlotinib
Type: small molecule
Year Accepted/Phase: 2004

Mechanism:

Erlotinib inhibits the tyrosine kinase activity of the EGFR, which is involved in the signaling pathways that regulate cell division and survival.

Chemical Structure:



Indication:

Tarceva is indicated for the treatment of locally advanced or metastatic NSCLC with EGFR exon 19 deletions or exon 21 (L858R) substitution mutations, and for first-line treatment in combination with gemcitabine for patients with locally advanced, unresectable, or metastatic pancreatic cancer.

Clinical trials:

BR.21 Trial (Phase III)
Pubmed: https://pubmed.ncbi.nlm.nih.gov/16014882/
Purpose: Evaluate the efficacy of erlotinib in patients with advanced NSCLC after failure of at least one prior chemotherapy regimen.
Dates: Conducted from 2001 to 2003.
Results: The BR.21 trial demonstrated that erlotinib significantly improved overall survival (OS) compared to placebo in patients with advanced NSCLC. The median OS was 6.7 months for the erlotinib group compared to 4.7 months for the placebo group. Progression-free survival (PFS) and response rates were also improved.
Impact: These results led to the FDA approval of erlotinib for the treatment of advanced NSCLC in 2004.

EURTAC Trial (Phase III)
Pubmed: https://pubmed.ncbi.nlm.nih.gov/22285168/
Purpose: Compare erlotinib with standard chemotherapy in European patients with advanced NSCLC and activating EGFR mutations.
Dates: Conducted from 2007 to 2011.
Results: The EURTAC trial found that erlotinib significantly improved PFS compared to chemotherapy in patients with EGFR-mutant NSCLC. Median PFS was 9.7 months for erlotinib versus 5.2 months for chemotherapy.
Impact: These findings reinforced the use of erlotinib as a first-line treatment for patients with EGFR-mutant NSCLC.

OPTIMAL Trial (Phase III)
Pubmed: https://pubmed.ncbi.nlm.nih.gov/21783417/
Purpose: Evaluate the efficacy and safety of erlotinib versus chemotherapy in Asian patients with advanced NSCLC harboring EGFR mutations.
Dates: Conducted from 2008 to 2010.
Results: The OPTIMAL trial showed that erlotinib significantly prolonged PFS compared to chemotherapy (13.1 months vs. 4.6 months). The response rate was also higher in the erlotinib group.
Impact: This trial further supported the use of erlotinib as a first-line therapy in patients with EGFR-mutant NSCLC, particularly in Asian populations where the prevalence of EGFR mutations is higher.

PA.3 Trial (Phase III)
Pubmed: https://pubmed.ncbi.nlm.nih.gov/17452677/
Purpose: Evaluate the efficacy of erlotinib in combination with gemcitabine in patients with advanced pancreatic cancer.
Dates: Conducted from 2001 to 2003.
Results: The PA.3 trial demonstrated that the combination of erlotinib and gemcitabine improved OS and PFS compared to gemcitabine alone in patients with advanced pancreatic cancer. The median OS was 6.24 months for the combination versus 5.91 months for gemcitabine alone.
Impact: These results led to the FDA approval of erlotinib for use in combination with gemcitabine for the treatment of locally advanced, unresectable, or metastatic pancreatic cancer in 2005.