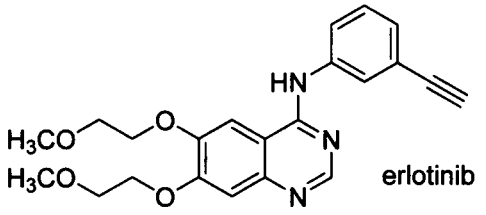
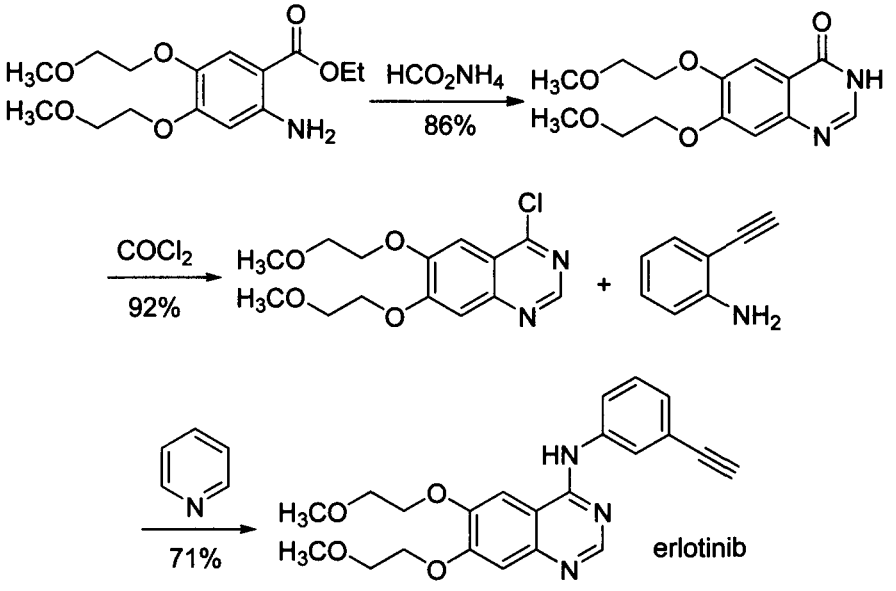
shown to be effective PTK inhibitors. Erlotinib specifically inhibits epidermal growth factor receptor (EGFR), a PTK that is expressed in high levels in tumor cells of numerous types of cancers, including pancreatic, breast, and lung cancer.



erlotinib

A facile synthesis of erlotinib, patented by Schnur and Arnold, began with the condensation of readily available ethyl-2-amino-4,5-bis-(2-methoxy-ethoxy)benzoate and formamide to produce the corresponding quinazolinone, 6,7-bis(2-methoxyethoxy)quinazolin-4(3*H*)-one, in high yield. Reduction of 6,7-bis(2-methoxyethoxy)quinazolin-4(3*H*)-one with oxalylchloride furnished the corresponding 4-chloroquinazoline in 92% yield.[43] Finally, reaction of the 4-chloroquinazolilne with 3-ethynylaniline under basic conditions afforded erlotinib in 71% yield (56% over three steps).



The folic acid analog trimetrexate is a competitive inhibitor of bacterial and protozoan dihydrofolate reductase. This compound is currently used as a treatment for *Pneumocystis carinii* pneumonia (PCP) in patients with immunocompromising conditions.