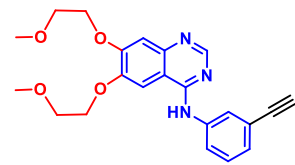


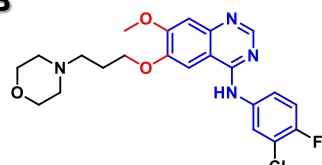
# Evolution of Small Molecule Kinase Drugs

Helen Lightfoot,<sup>†</sup> Frederick Goldberg,<sup>††</sup> Joerg Sedelmeier<sup>‡</sup>

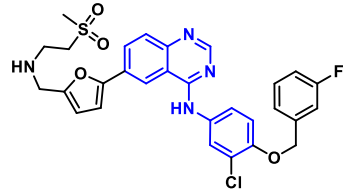
## ErbB



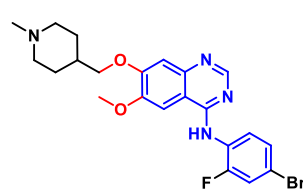
erlotinib (INN 2002)



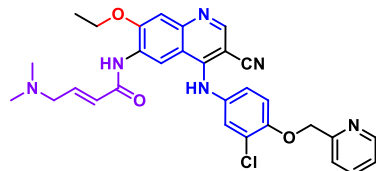
gefitinib (INN 2002)



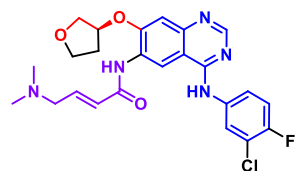
lapatinib (INN 2003)



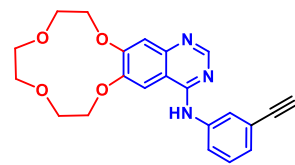
vandetanib\* (INN 2004)



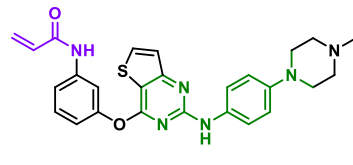
neratinib (INN 2007)



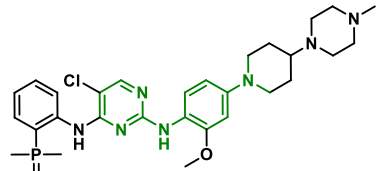
afatinib (INN 2010)



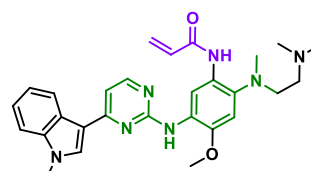
icotinib (INN 2011)



olmutinib (INN 2015)

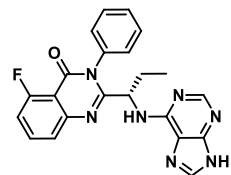


brigatinib\* (INN 2016)

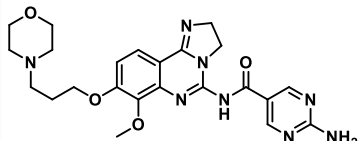


osimertinib (INN 2016)

## PI3Kδ

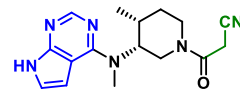


idelalisib (INN 2012)

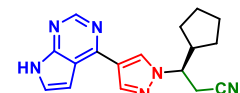


copanlisib (INN 2012)

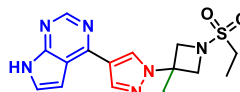
## JAK



tofacitinib (INN 2011)

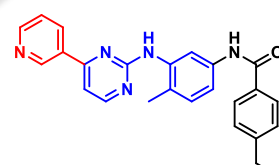


ruxolitinib (INN 2011)

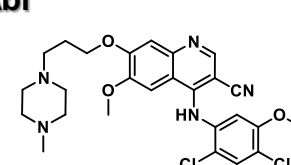


baricitinib (INN 2013)

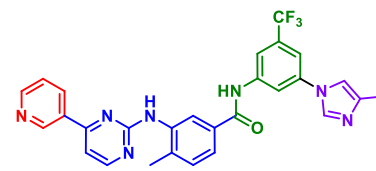
## BCR-Abl



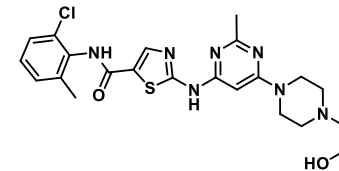
imatinib\* (INN 2001)



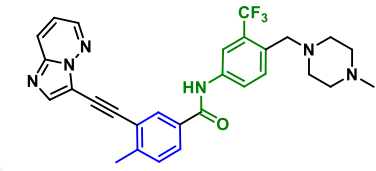
bosutinib\* (INN 2005)



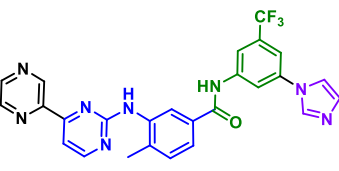
nilotinib\* (INN 2005)



dasatinib\* (INN 2005)

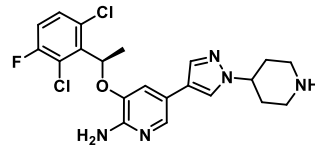


ponatinib\* (INN 2010)

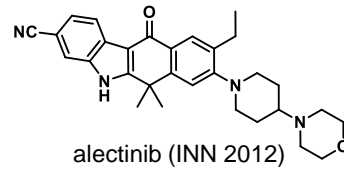


radotinib\* (INN 2010)

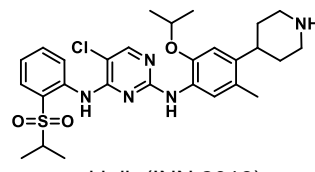
## ALK



crizotinib\* (INN 2011)

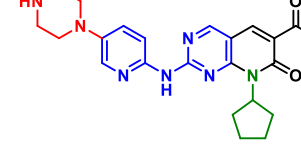


alectinib (INN 2012)

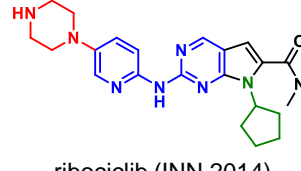


ceritinib (INN 2013)

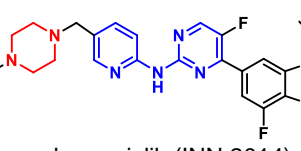
## CDK



palbociclib (INN 2013)

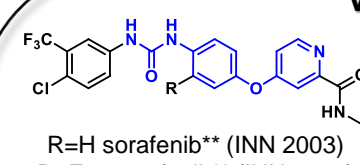


ribociclib (INN 2014)

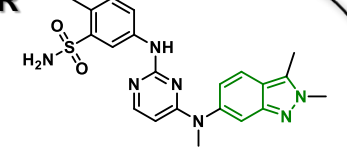


abemaciclib (INN 2014)

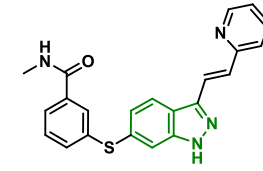
## VEGFR



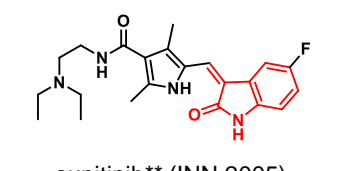
R=H sorafenib\*\* (INN 2003)  
R=F regorafenib\*\* (INN 2009)



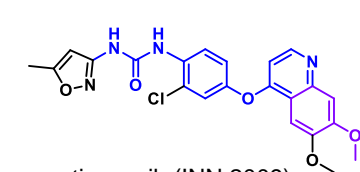
pazopanib\* (INN 2005)



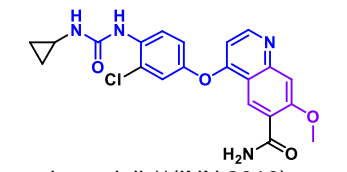
axitinib\* (INN 2005)



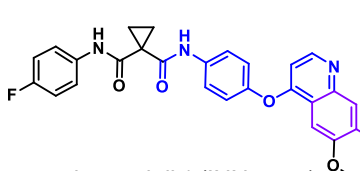
sunitinib\*\* (INN 2005)



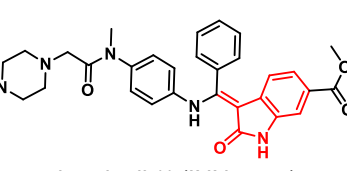
tivozanib (INN 2009)



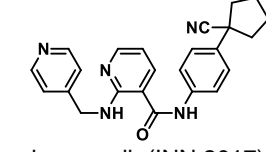
lenvatinib\*\* (INN 2010)



cabozantinib\* (INN 2011)

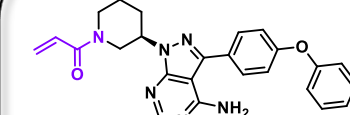


nintedanib\*\* (INN 2011)

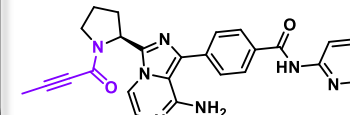


rivoceranib (INN 2017)

## BTK

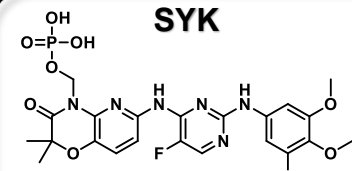


ibrutinib (INN 2013)



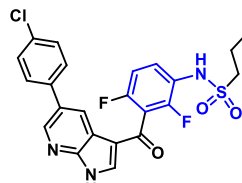
acalabrutinib (INN 2016)

## SYK

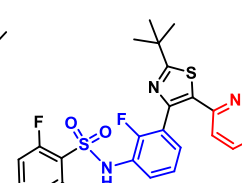


fostamatinib (INN 2009)

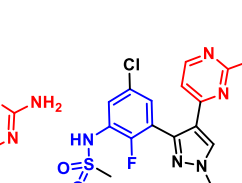
## BRAF



vemurafenib (INN 2011)

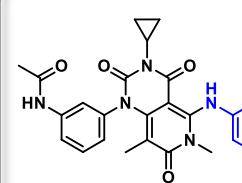


dabrafenib (INN 2012)

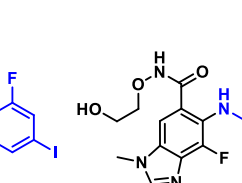


encorafenib (INN 2013)

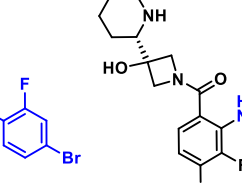
## MAP2K/MEK



trametinib (INN 2011)



binimetinib (INN 2013)



cobimetinib (INN 2013)