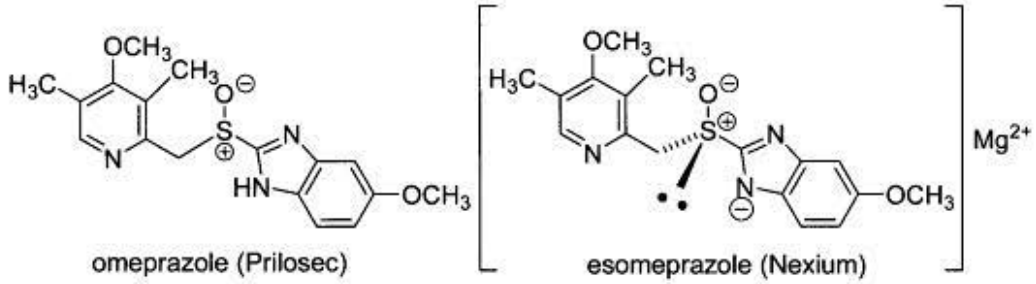
# Drug Discovery

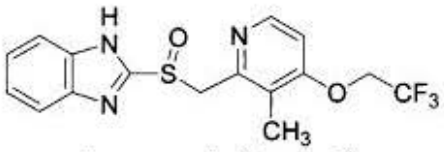
## PRACTICES, PROCESSES, AND PERSPECTIVES



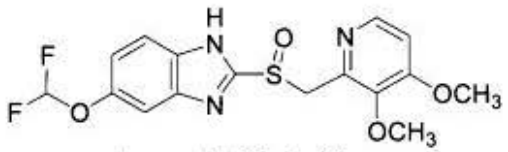

omeprazole (Prilosec) esomeprazole (Nexium)

In 1987, a group led by Gunnel Sundén embarked on a focused program in finding an omeprazole backup with better bioavailability. Among all the compounds in their hands, only one was better than omeprazole. It was the *S*-(–)-enantiomer of omeprazole, esomeprazole (Nexium). When tested in rats, esomeprazole was 4–5 times more bioavailable than the *R*-enantiomer.[82] Another lucky break was that they tested esomeprazole directly in man and saw similar effects to what they observed with rats. Later on, when the two isomers were tested on dogs, no significant difference of efficacy was detected for the two isomers. In this case, rat was a better animal model than dog. If they used dogs for their initial *in vivo* tests, they probably would never have found esomeprazole. Esomeprazole (Nexium) was approved in Sweden in 2000 and in the U.S. in early 2001, just when Prilosec's U.S. patent expired in April.

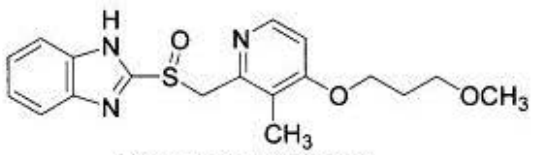
Lansoprazole (Prevacid) is another proton pump inhibitor sold by TAP Pharmaceuticals, a joint venture of Abbott Laboratories and Takeda. Two other PPIs are pantoprazole (Protonix)[83] and rabeprazole (Aciphex).




lansoprazole (Prevacid)




pantoprazole (Protonix)




rabeprazole (Aciphex)