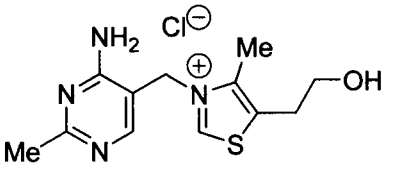
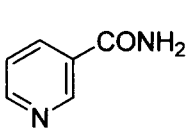
Thiazoles also play a prominent role in nature. For example, the thiazolium ring present in vitamin B_1 serves as an electron sink and its coenzyme form is important for the decarboxylation of α-keto-acids. The left-hand fragment of vitamin B_1 is an aminopyrimidine.

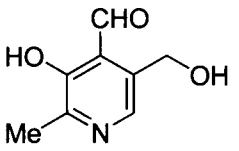


Vitamin B_1

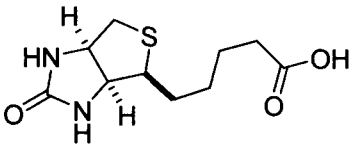
Vitamin B_5 (nicotinic acid amide) and vitamin B_6 (pyridoxal) are pyridine-based molecules, whereas vitamin B_7 (biotin) is a bi-heterocycle fusing reduced imidazole and thiophene.



vitamin B_5 (nicotinic acid amide)



vitamin B_6 (pyridoxal)



vitamin B_7 (biotin)

1.4 Importance of Heterocycles in Drug Discovery

It will be evident from the ensuing chapters that heterocycles play an extremely important role in drug discovery, in general, and in medicinal chemistry, in particular. Heterocycle-containing drugs are found in all therapeutic areas including cardiovascular and metabolic diseases, central nervous system (CNS), anti-cancer, anti-inflammatory, anti-ulcer, anti-infective drugs, and so on.

1.4.1 Five-Membered Heterocycles with One Heteroatom

Three-membered heterocycles are usually not fragments of drugs because they are reactive toward nucleophiles in physiological environments. Cancer