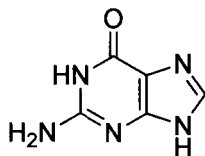
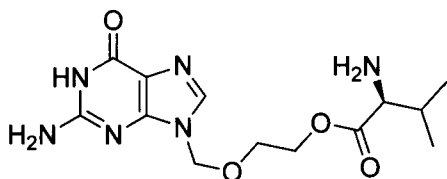


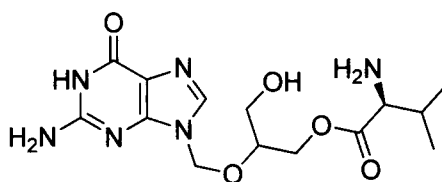
Guanine, one of the four main nucleobases found in DNA and RNA, is another derivative of purine, consisting of a fused pyrimidine-imidazole ring system. Its uses in pharmaceutical development can be exemplified with the following two important drugs. Valacyclovir is an antiviral drug used in the management of herpes simplex, herpes zoster (shingles), and herpes B. It is a prodrug, being converted *in vivo* to acyclovir (9-[(2-hydroxyethoxy)methyl]guanine). It is marketed by GlaxoSmithKline under the trade names Valtrex and Zelitrex and is currently available in generic form in the United States. Valganciclovir hydrochloride (Valcyte) is manufactured by Hoffmann-La Roche and is an antiviral medication used to treat cytomegalovirus (CMV) infections. As the L-valyl ester of ganciclovir, it is a prodrug for ganciclovir. After oral administration, it is rapidly converted to ganciclovir by intestinal and hepatic esterases. Human CMV infection is typically unnoticed in healthy people, but it can be life threatening for the immunocompromised, such as HIV-infected persons, organ transplant recipients, or newborn infants.



guanine



valacyclovir



valganciclovir

Risperidone contains a pyrimidine-4-one and is an atypical antipsychotic sold under the trade name Risperdal. It is used to treat schizophrenia (including adolescent schizophrenia), schizoaffective disorder, the mixed and manic states associated with bipolar disorder, and irritability in people with autism. The drug was developed by Janssen-Cilag and first released in 1994. Pemetrexed (brand name Alimta) is a chemotherapy drug manufactured and marketed by Eli Lilly. Its indications are the treatment of pleural mesothelioma as well as non-small cell lung cancer.<sup>5</sup> Methotrexate (MTX) is an antimetabolite and antifolate drug. It contains a 2,4-diaminopteridine heterocyclic ring system and is used in the treatment of cancer, autoimmune diseases, and ectopic pregnancy, and for the induction of