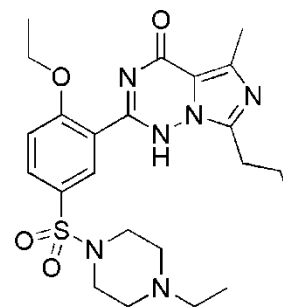




**Part B)** In 2001, Bayer (in competition with Pfizer) began clinical trials with Levitra (Vardenafil-hydrochloride). It is structurally very similar to Viagra, however, Bayer was clever and moved one of the nitrogen atoms in the heterocyclic core to get around the Viagra patent owned by Pfizer. Condensation of an imido hydrazide and an  $\alpha$ -ketoester will form part of the heterocyclic core. As a group, come up with a reasonable synthesis of the  $\alpha$ -ketoester starting from **alanine** using any additional reagents you require.



Levitra; Bayer, 2001

