Pre-Exposure Prophylaxis (PrEP)

**Significance:** Pre-exposure prophylaxis (PrEP) is a HIV prevention method for uninfected individuals. It virtually eliminates the risk of getting HIV if taken consistently and correctly. Truvada is the drug used for PrEP. It contains a combination of emtricitabine and tenofovir disoproxil fumarate (prodrug).

**Comment:** Emtricitabine was synthesized by nucleosidation of a readily available oxathiolane derivative with the silylated nucleobase B. The high level of stereoselectivity is provided by in situ complexation of the oxathiolane and the Lewis acid. Tenofovir was synthesized in just six steps starting from commercially available (S)-glycidol.

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**Synthesis of emtricitabine (2′-deoxy-5-fluoro-3′-thiacytidine, FTC):**

1. Diazal-H
2. Ac2O

64% over 2 steps

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**Synthesis of tenofovir:**

1. Pd/C, HCO2NH4, EtOH
2. NaOMe/MeOH

76% yield

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**Crude product**

1. aq NaOH
2. aq HCl
3. acetone–H2O

82% yield

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**Tenofovir disoproxil fumarate**

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**Truvada**

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**Key words**

truvada emtricitabine tenofovir