CHEMISTRY 4000

Problem Set #4: Ticlopidine (aka Ticlid®) and Clopidogrel (aka Plavix®)

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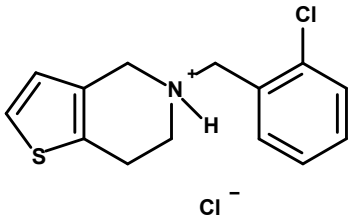
Ticlopidine (aka Ticlid®)

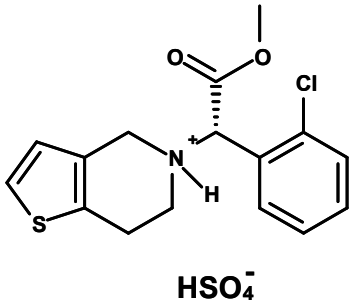
- Ticlopidine (Ticlid®) is an antithrombotic drug. In other words, it prevents blood clots by inhibiting platelet aggregation.
- Ticlopidine was launched in 1979. The structurally similar Clopidogrel (Plavix®) was launched in 1993.
  - Both prevent ADP from initiating platelet aggregation by blocking it from binding to the P2Y12 receptor.
  - Both are actually prodrugs, requiring activation by cytochrome P450 (though the active species produced from each drug is different).
  - Because they require metabolic activation, these drugs are not immediately effective. Rather, they tend to be used as preventative medicine.
  - Clopidogrel has fewer side effects than ticlopidine (which is harder on the liver and should not be taken by patients with liver disease).

Ticlopidine (aka Ticlid®)

- The structure of ticlopidine is:



- The structure of clopidogrel is:



Ticlopidine (aka Ticlid®)

- The active form of clopidogrel looks like: