

Opium

Used since ancient times

Medicinal properties



Painkiller

Blood

Poison

Fibre Analysis

Fingerprints

DNA

Opium

Obtained from seed heads of the poppy
papaver somniferum



Seed head of opium poppy

Opium

Seed heads are scored

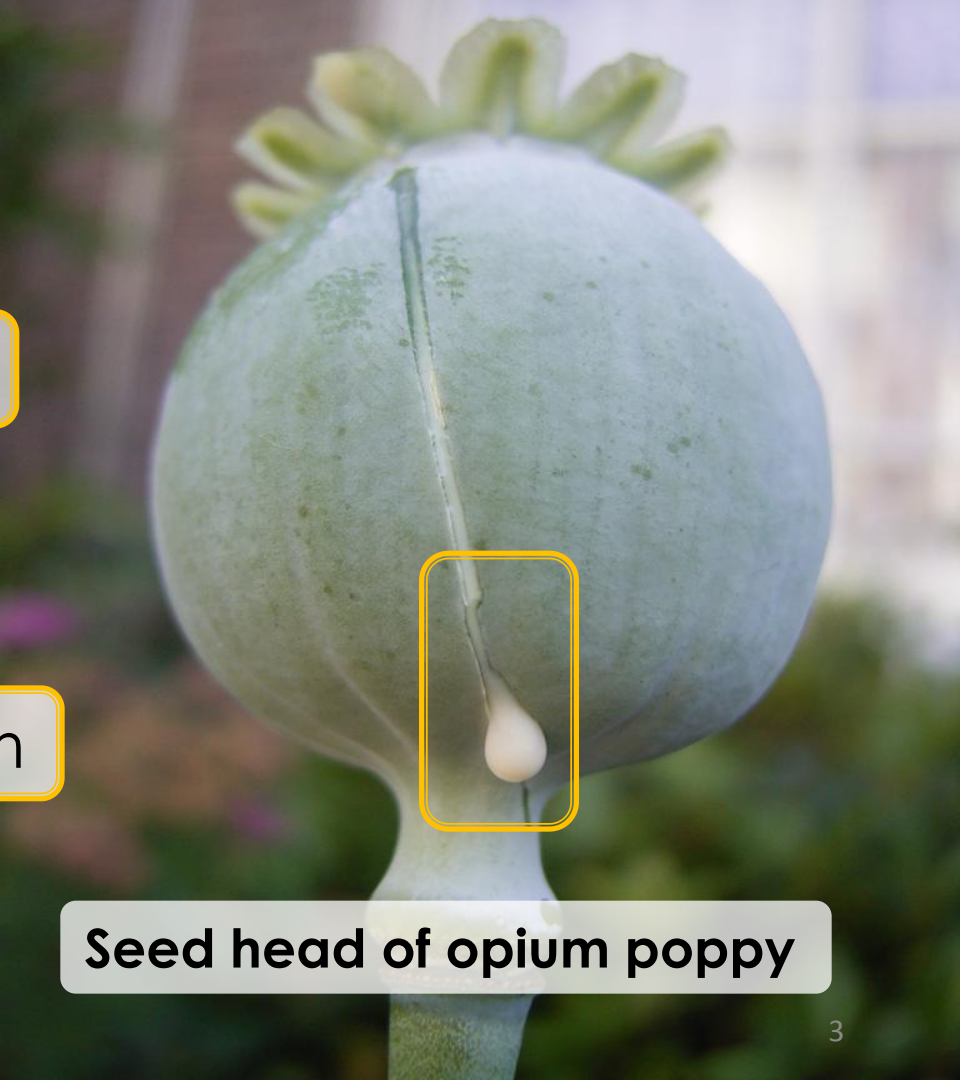


Latex

Dried latex



Opium

A close-up photograph of a green, unopened opium poppy seed head. A small, light-colored, teardrop-shaped latex droplet is visible on the stem, highlighted by a yellow rectangular box.

Seed head of opium poppy

Opium

Paracelsus



Opium extract in alcohol



Laudanum



Medicinal use

Major illegal producer



Afghanistan

Opium

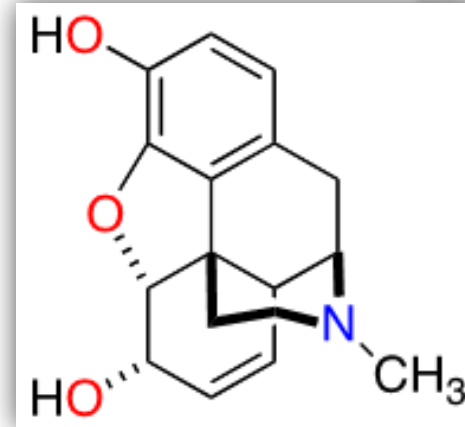
Morphine



Active component
of opium



Still clinically used
as a painkiller



Morphine

Opium

Major legal producer



Tasmania

Uses



Gastrointestinal problems

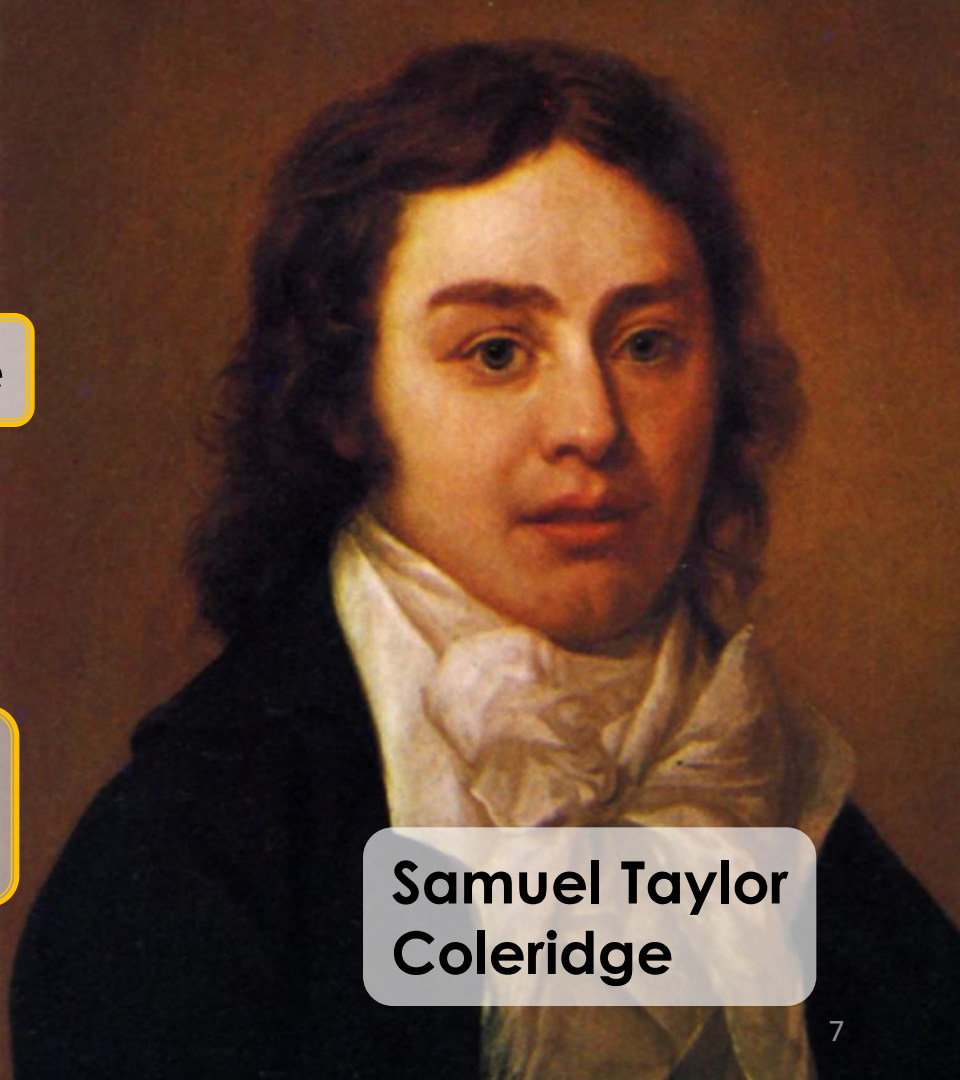
Opium

Samuel Taylor Coleridge

“Xanadu”



Written under the
influence of opium



**Samuel Taylor
Coleridge**

Opium

"This fragment with a good deal more, not recoverable, composed, in a sort of Revery brought on by two grains of Opium taken to check a dysentery, at a Farm House between Porlock and Linton, a quarter of a mile from Culbone Church, in the fall of the year, 1797."



Samuel Taylor Coleridge

Opium

Still used in medicines



Opium

Inspired composers

DNA

Fingerprints

Fibre Analysis

Poison

Blood

Opium

*Symphonie
Fantastique*



Hector Berlioz

Opium

Inspired composers

Caused wars



Two opium wars between the British and the Chinese

Opium

Two opium wars
between the British
and the Chinese



1839-1842



1856-1860



**Battle of the Palikiao,
Second Opium War**

Opium

Inspired composers

Caused wars



Two opium wars between
the British and the Chinese

Affected the Second World War

Opium

Hermann Goering



Head of the German
air force during WW2



Morphine addict



Hermann Goering

Trio

Opium



Crude material from plant

Morphine



Active ingredient in crude material

Heroin



What is heroin?

Heroin

Semi-synthetic

Invented by Bayer Co.

Diacetylmorphine

More potent than morphine



Heroin

Banned in many countries

In a few countries



May still be used
medicinally



Doctor prescription

Harold Shipman

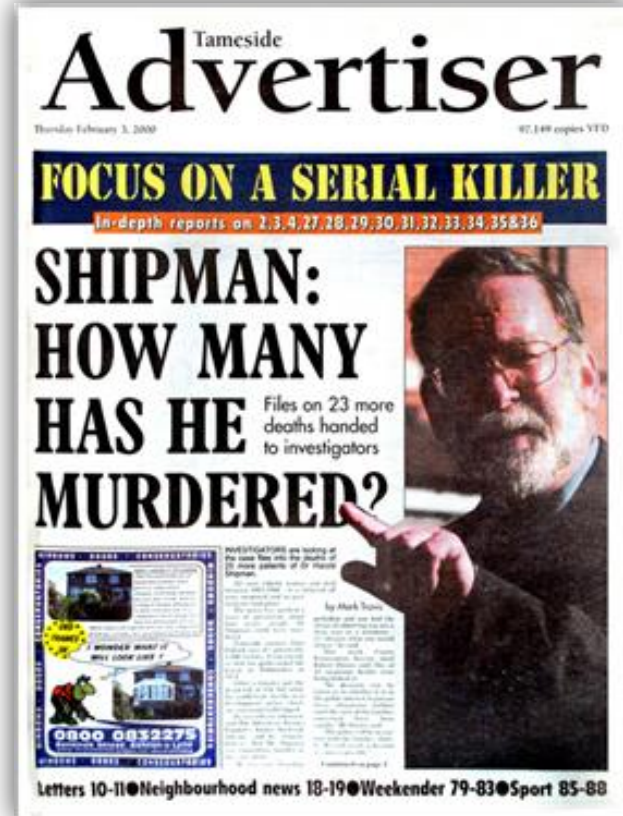
Serial killer

Murdered old ladies

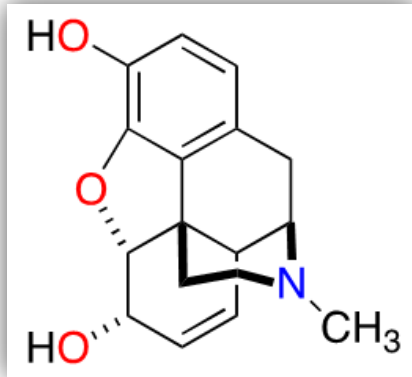


Administered lethal doses of heroin

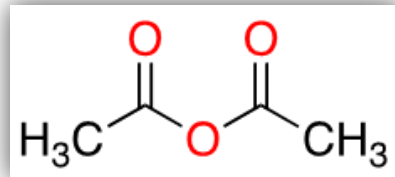
No investigation until he forged a will



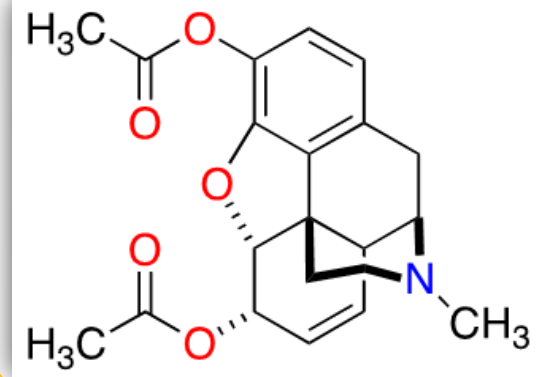
How heroin works



Morphine



Acetic anhydride



**Diacetylmorphine
or diamorphine**

How heroin works

“Heroin”



Impure

Pure



Diacetylmorphine / diamorphine

Acetic anhydride



Controlled in many Asian countries

How heroin works

How does diamorphine work?

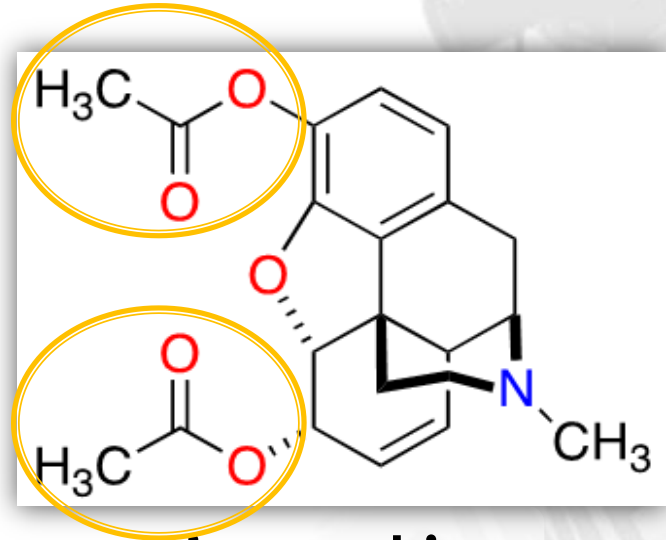
Why is it much more effective than morphine?

Diamorphine / diamorphine

Morphine derivatization

Faster transport
of the molecule

Acetyl groups are rapidly
metabolized to morphine



Diamorphine

Diamorphine / diamorphine

Faster transport to the brain



Higher concentration in a shorter time

Rapid metabolization to morphine



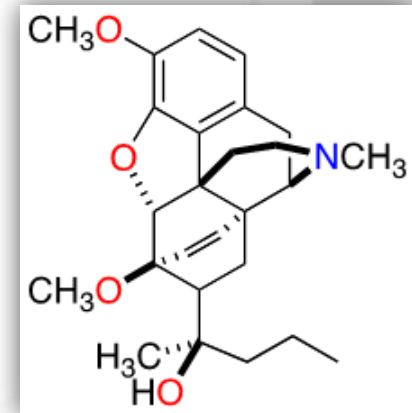
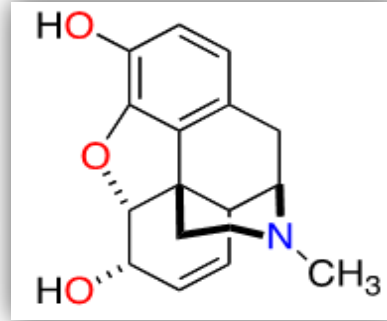
Diamorphine not detected in blood / urine

Morphine analogs

Etorphine



Very powerful
tranquilizer



Morphine analogs

Etorphine



Very powerful
tranquilizer



T-rex

Heroin

Related compounds



Morphine



Codeine



Thebaine



Acetyl codeine

Heroin

Unrelated compounds



Papaverine



Noscapine

Cutting agents



Sugar



Caffeine



Barbiturates

Heroin

Analysis of impurities



GC or HPLC



Show if two samples came from the same source