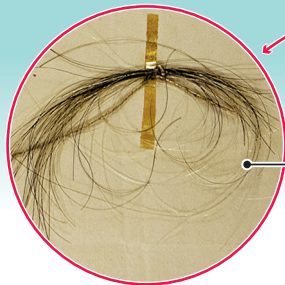


# Beethoven's genome sequenced

Using DNA from locks of Beethoven's hair, an international team of researchers suggest that the composer died from liver disease brought on by a combination of factors nearly 200 years ago



**Ludwig van Beethoven**

Dec 16, 1770–  
Mar 26, 1827

*Stumpff Lock, from  
which genome was  
sequenced*



## LIVER CONDITION

### ■ Genetic predisposition:

Mutations in two genes

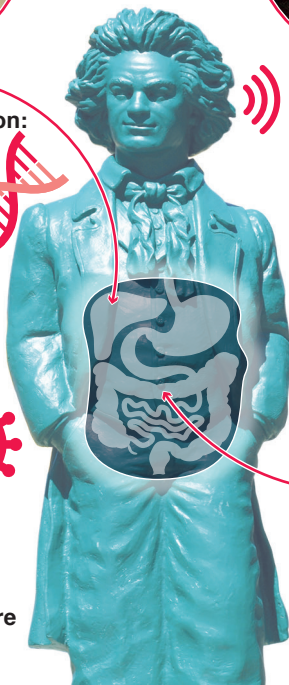
– **PNPLA3** and

**HFE** – would  
have tripled  
risk for liver  
disease

### ■ Viral infection:

Presence of  
**Hepatitis B**  
virus in DNA  
indicates  
liver infection  
few months  
before death

**New findings suggest  
genetics, viral infection  
and Beethoven's high  
alcohol consumption,  
likely caused liver failure  
widely believed to have  
killed him at age 56**



## DEAFNESS

Beethoven suffered  
progressive hearing  
loss, which began in  
late 20s and led to  
his being deaf  
by 44

**No genetic  
evidence found  
for conditions  
hypothesised by  
some experts such  
as otosclerosis or  
Paget's disease**

## DIGESTIVE ISSUES

Beethoven's  
gastrointestinal  
problems not  
caused by coeliac  
disease or lactose  
intolerance, genomic  
data shows