Molecular Physics Laboratory

Radiation Damage in Physiological Environments

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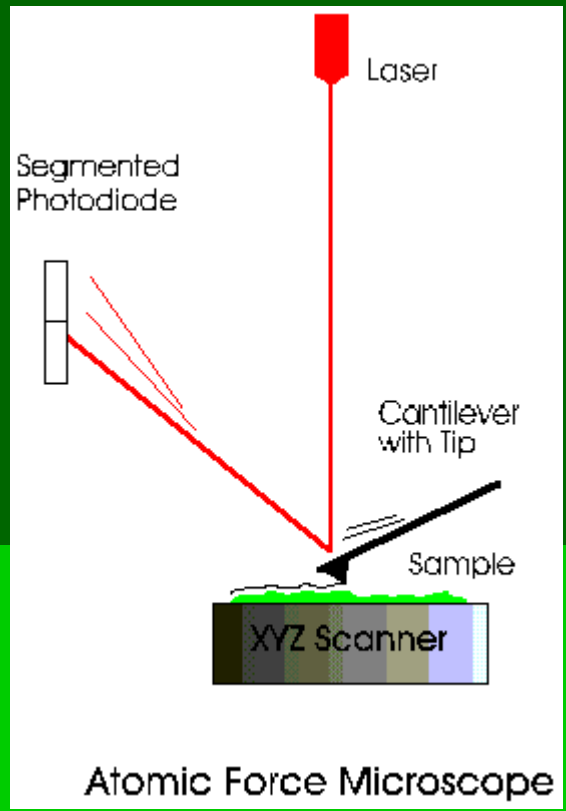
Atomic Force Microscope

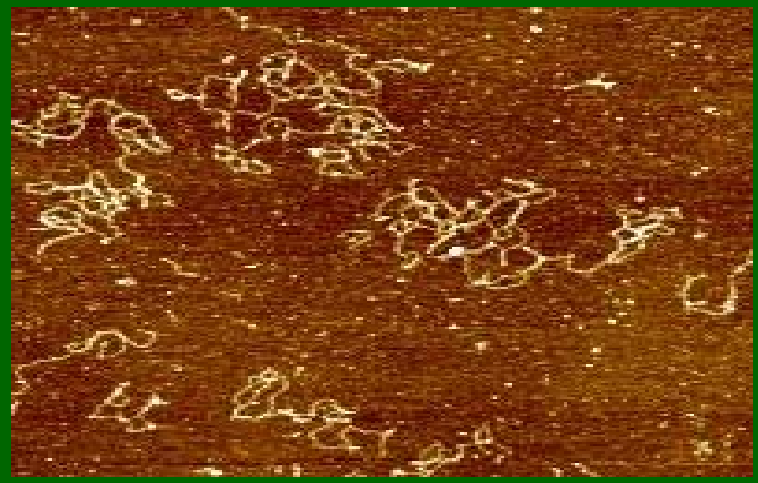
The AFM works by scanning a fine ceramic or semiconductor tip over a surface much the same way as a phonograph needle scans a record.

The tip is positioned at the end of a cantilever beam shaped much like a diving board. As the tip is repelled by or attracted to the surface, the cantilever beam deflects



AFM Images

- DNA

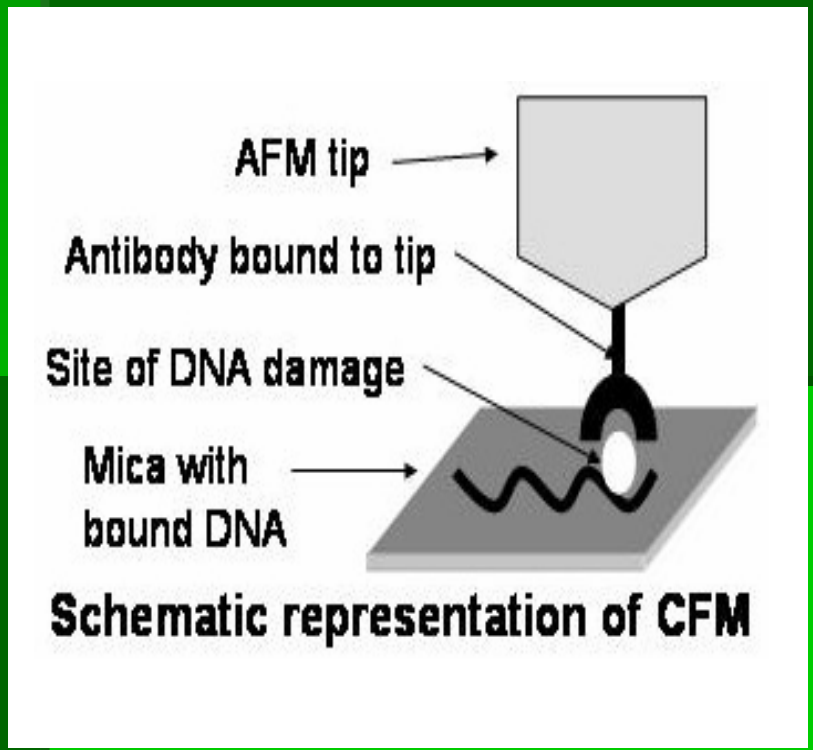


Part of an image of DNA taken using contact mode under propanol.

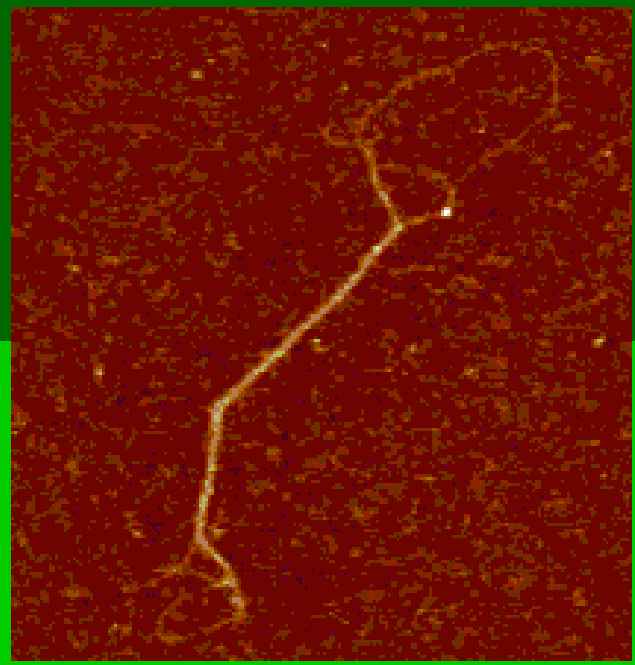
In future we can use AFMs to manipulate DNA !

High Resolution AFM of DNA

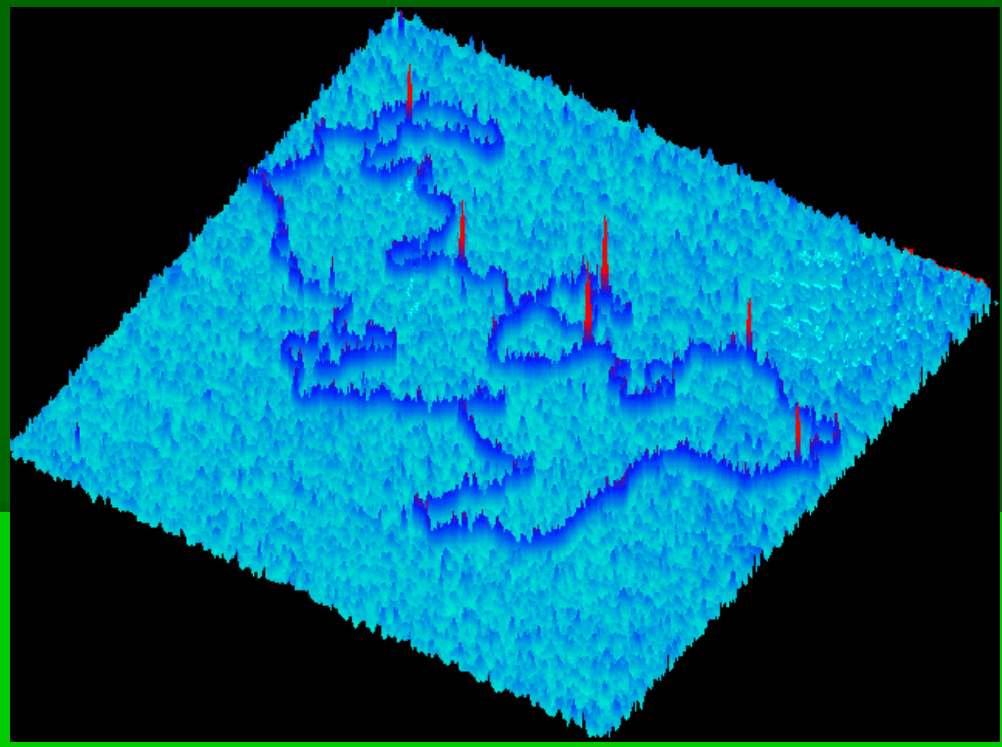
•Contact mode AFM imaging of double-stranded DNA. The thickness of non-supercoiled loop is consistent with the duplex diameter. Portions of the double-stranded DNA were teased out by increasing the AFM loading force



Schematic representation of CFM

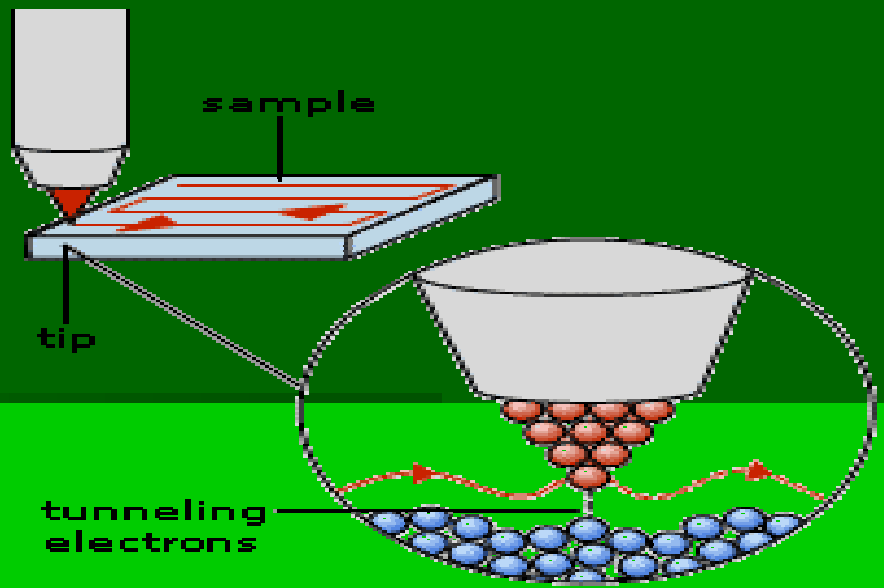


Site specific binding of DNA endonucleases to a plasmid immobilised on a mica surface.

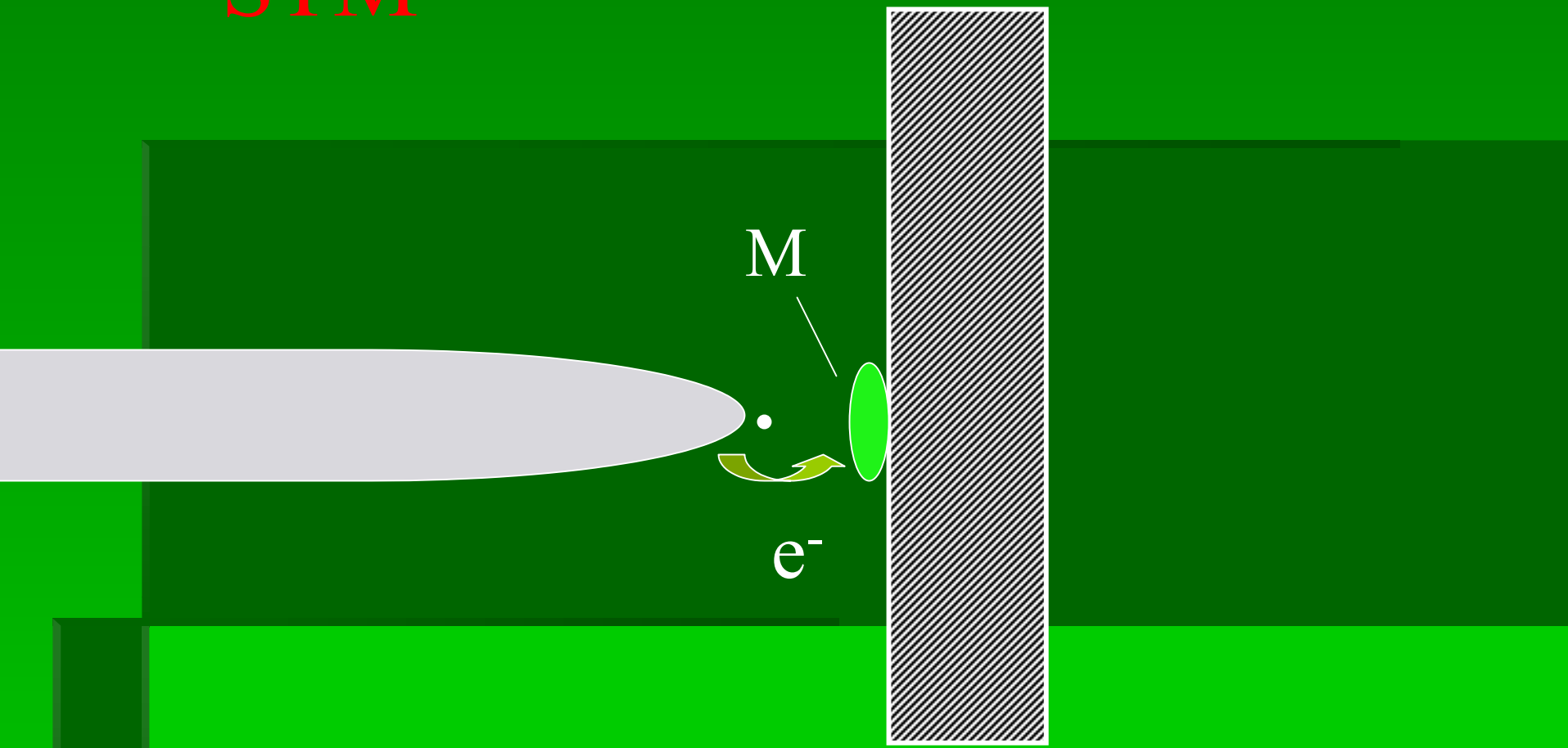


Scanning Tunnel Microscope

Tunnelling current from fine metal tip interacts with substrate



STM



Single Molecule Engineering

Crossed molecular beam set-up for atom-molecule collisions To be set up in Lisbon !