



# Nanomedicine?

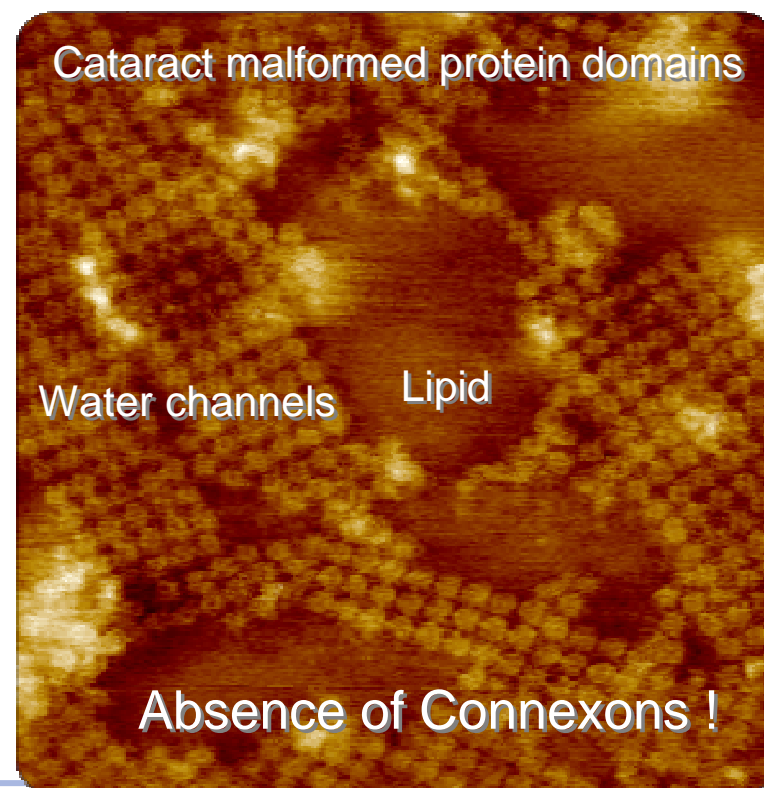
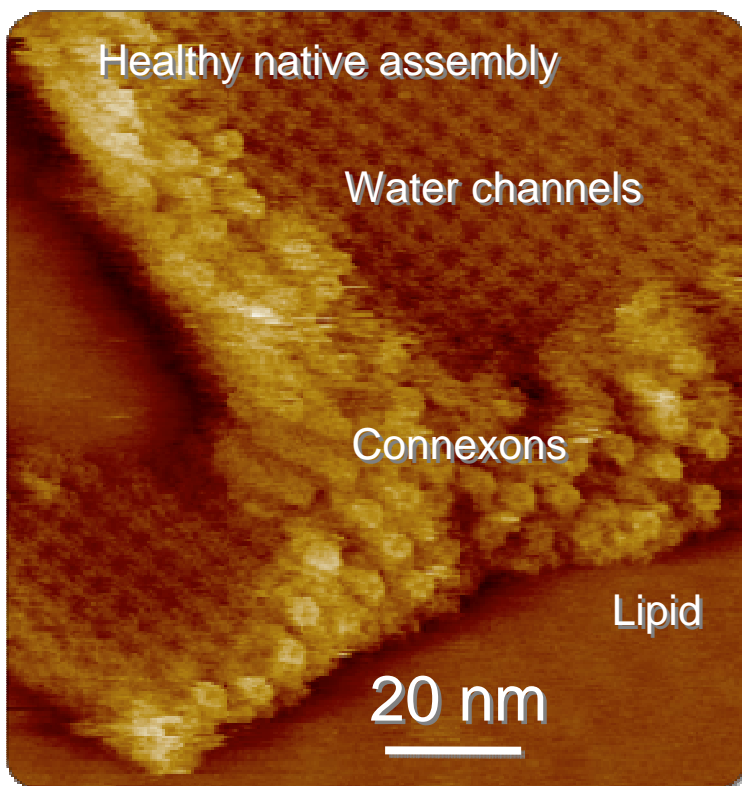
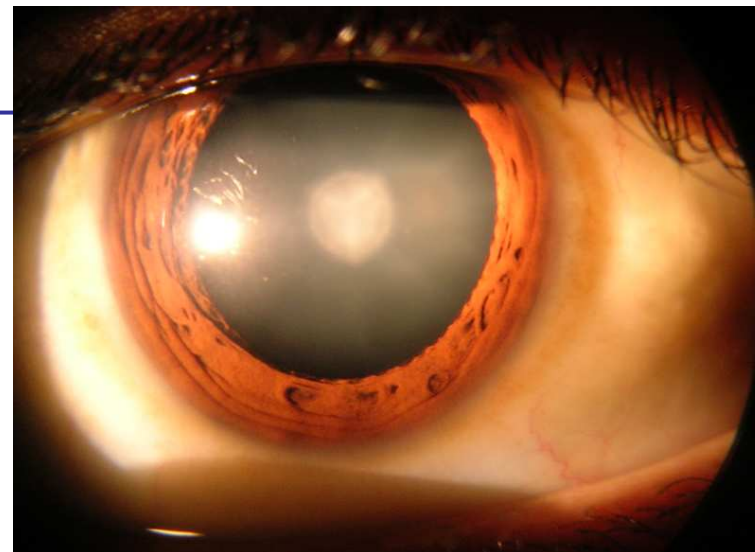
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- ❖ Nano-Imaging
- ❖ Nano-Force-Spectroscopy
- ❖ Nano-Mechanics
- ❖ Nano-Toxicology
- ❖ Nano-Instrumentation



## Nano-Imaging: Cataract pathology

Cataract:  
Clouding that develops  
in the crystalline lens of the eye

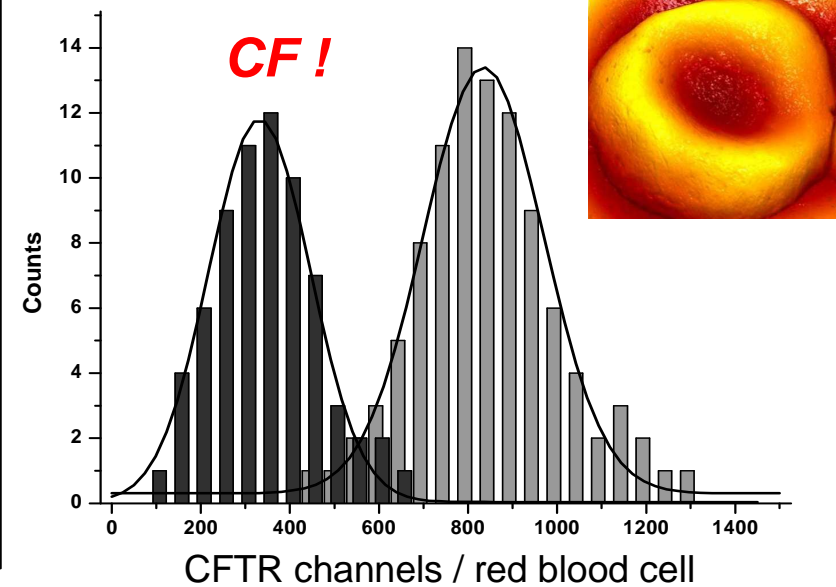
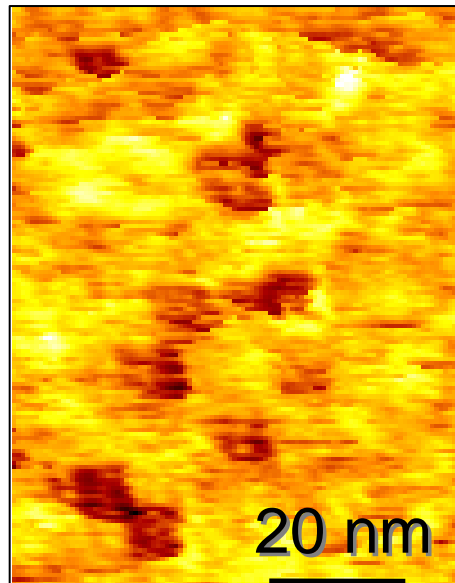
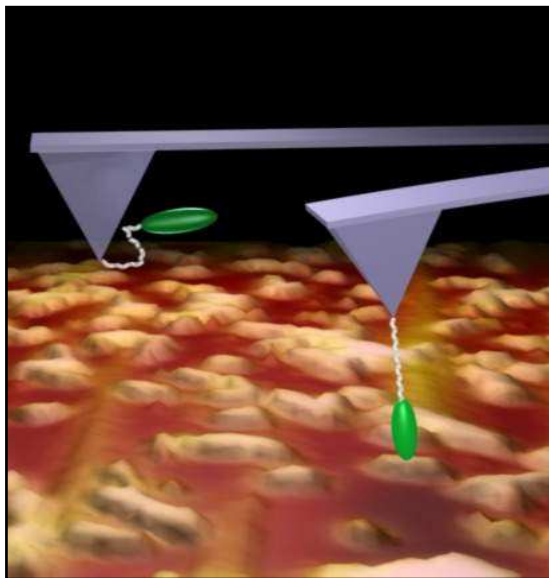


Working Groups involved: WG 1 WG 3 WG 5



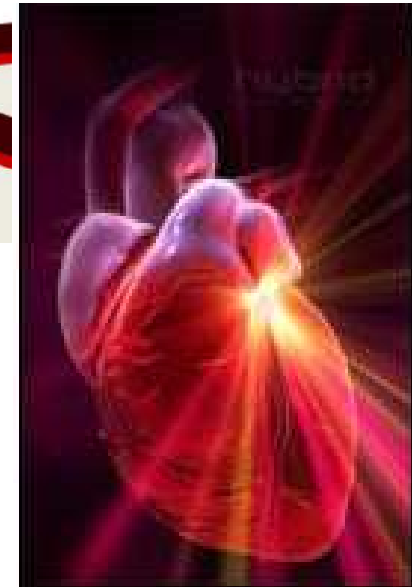
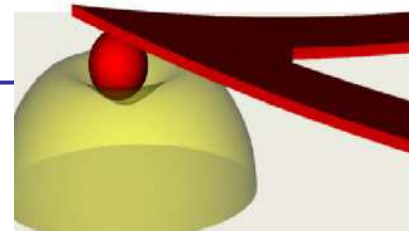
# Nano-Force-Spectroscopy: Cystic Fibrosis

Cystic fibrosis (CF):  
a common hereditary disease  
which affects lungs and pancreas  
- Life expectancy ~ 40 yrs -



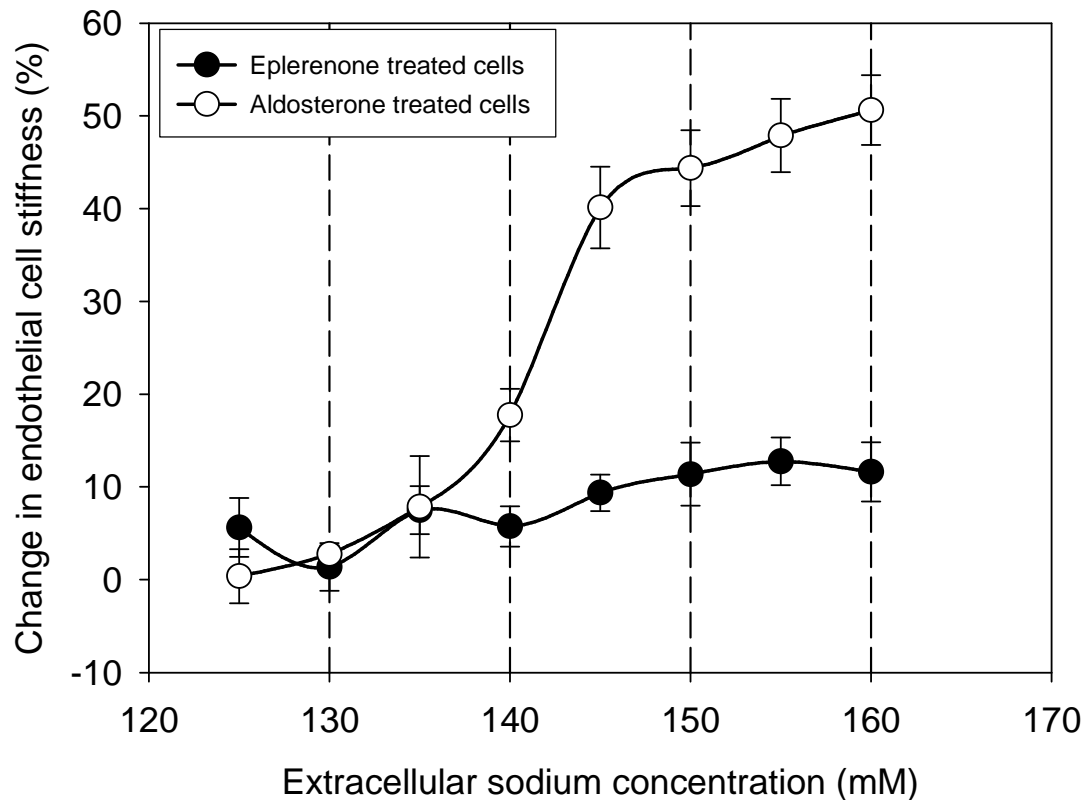


# Nano-Mechanics: Hypertension



## Hypertension:

a chronic medical condition in which the blood pressure is elevated. Most common cardiovascular disease leading atherosclerosis, heart attack and apoplexia



### Immediate Clinical Impact

Revisiting the Dialysate Sodium Prescription as a Tool for better Blood Pressure in Hemodialysis Patients

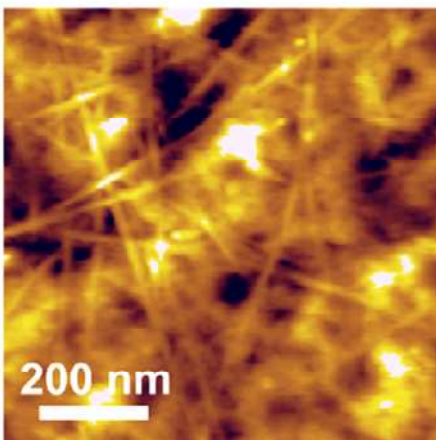
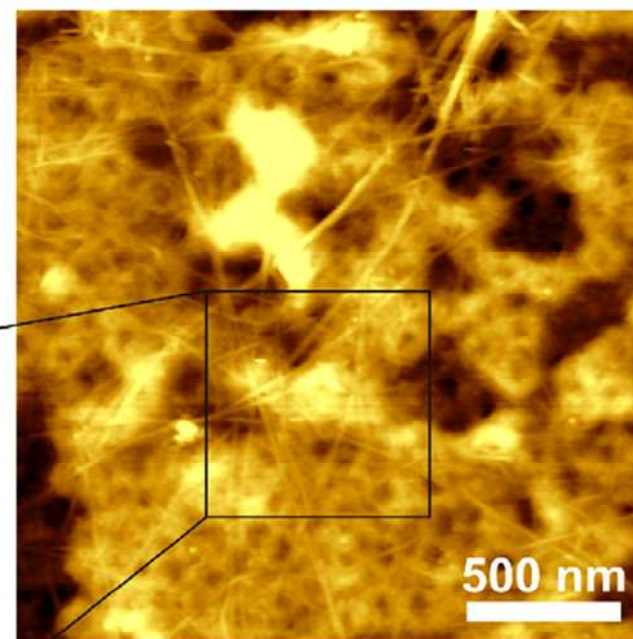
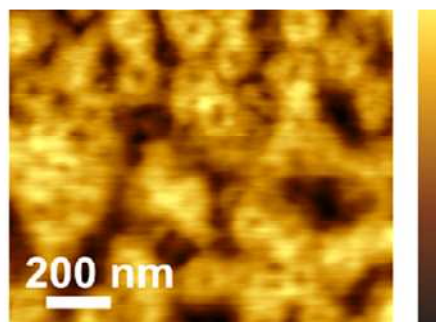
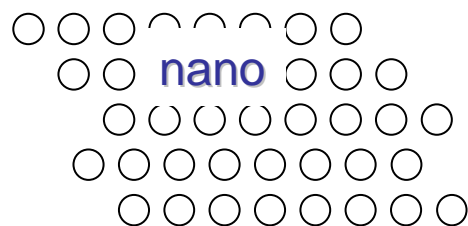
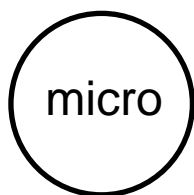
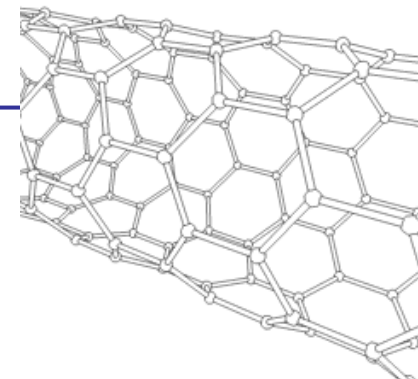
American Soc Nephrology  
2008



# Nano-Toxicology: Carbon Nanotubes

- Extremely electrically conductive
- Stronger than steel
- Lighter than aluminum
- **Biologically highly reactive**

Inner Diameter:  
less than 0.3 nm



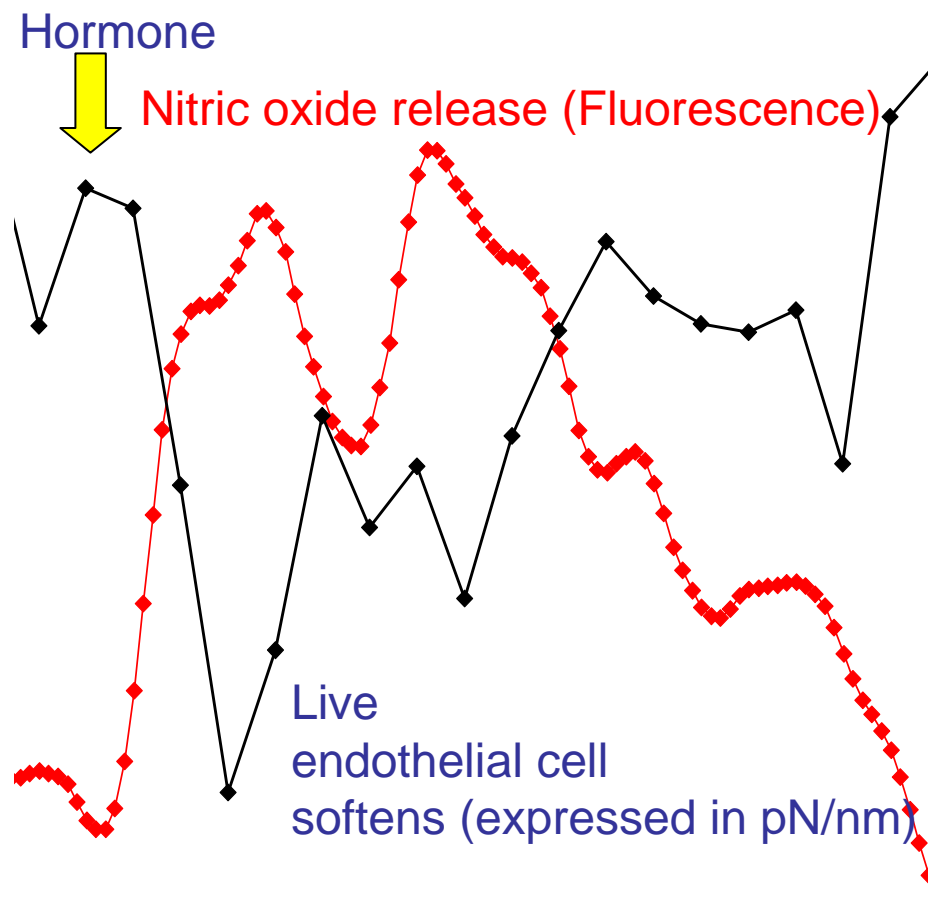
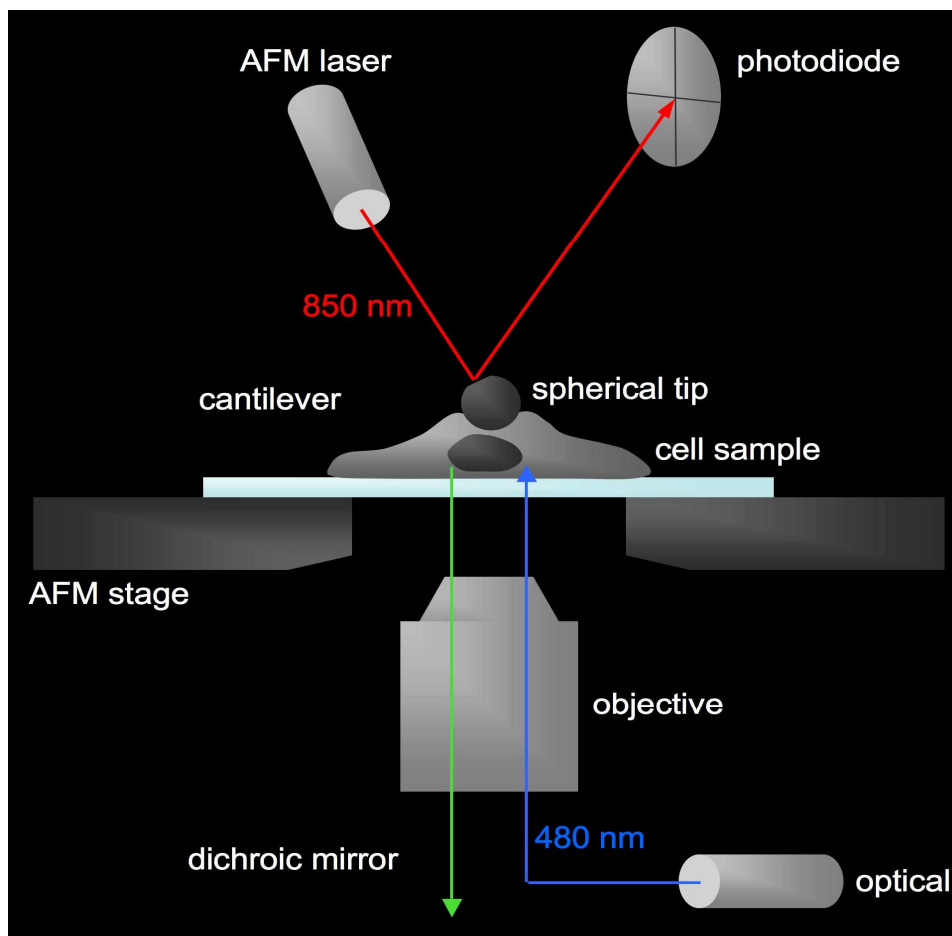
Carbon Nanotubes  
docking to the nuclear envelope



## Nano-Instrumentation: AFM-FM in diagnosis

### Endothelial Dysfunction:

a systemic pathological state of the endothelium that lacks the release of nitric oxide (NO)

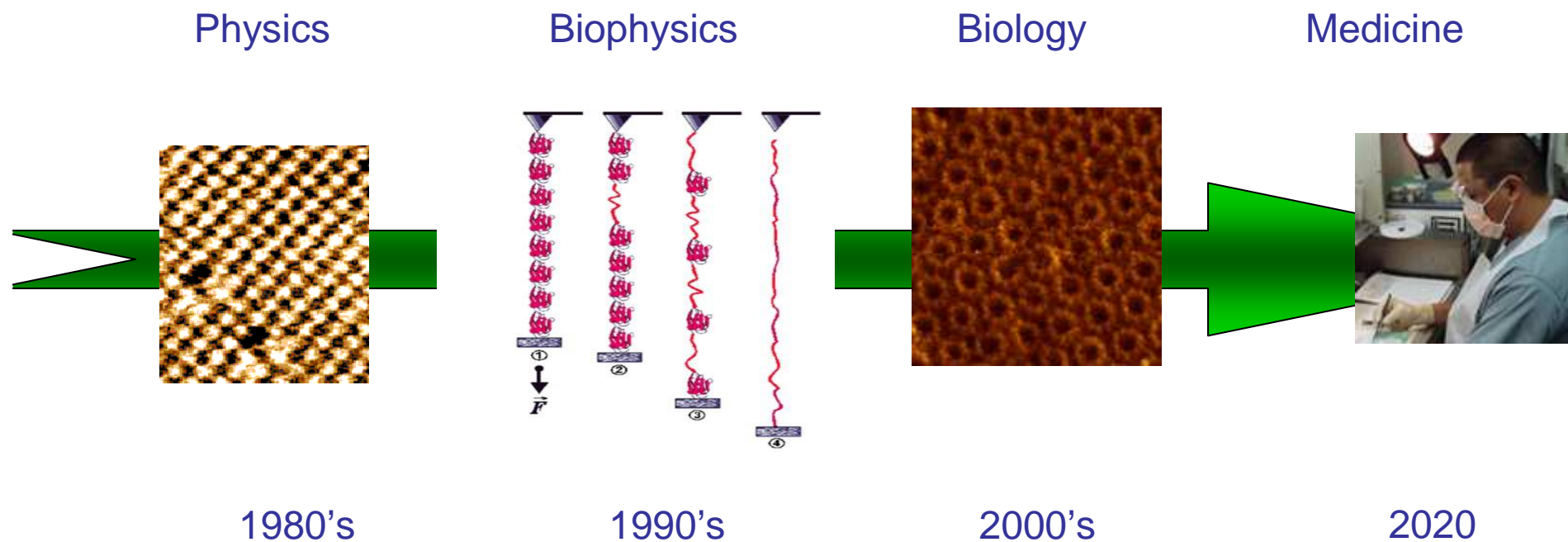


Working Groups involved: WG 1 to 5



# Objective of the 4-years COST Action

To further develop and transfer the biophysical achievements of AFM to NanoMedicine and clinical research.





# Vision

Physician Scientist with Medical Project

- AFM Newcomer -



Hospital

AFM  
lab

AFM  
Training Center



- AFM trained -

Physician Scientist with AFM data