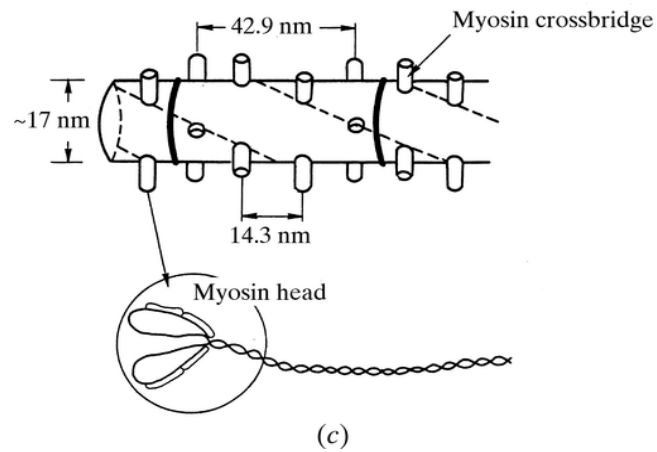
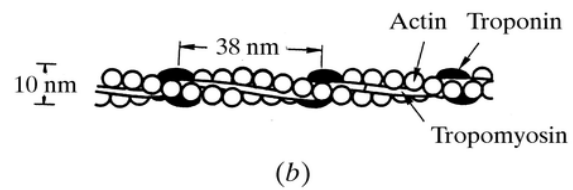
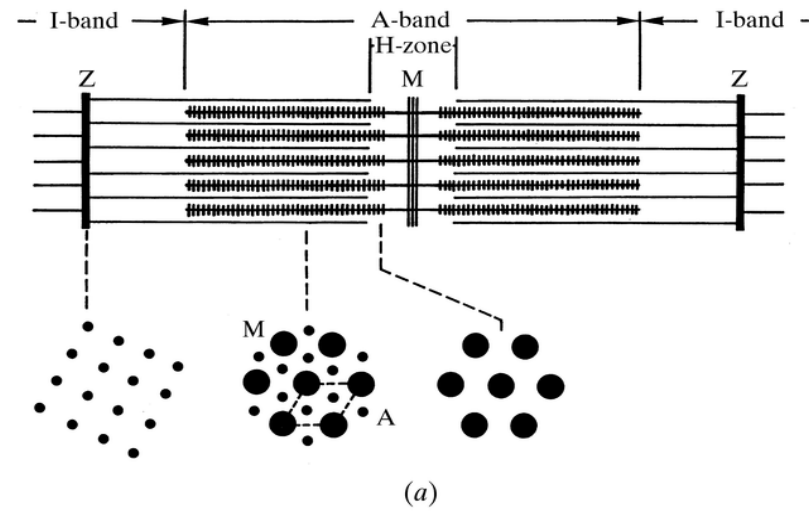
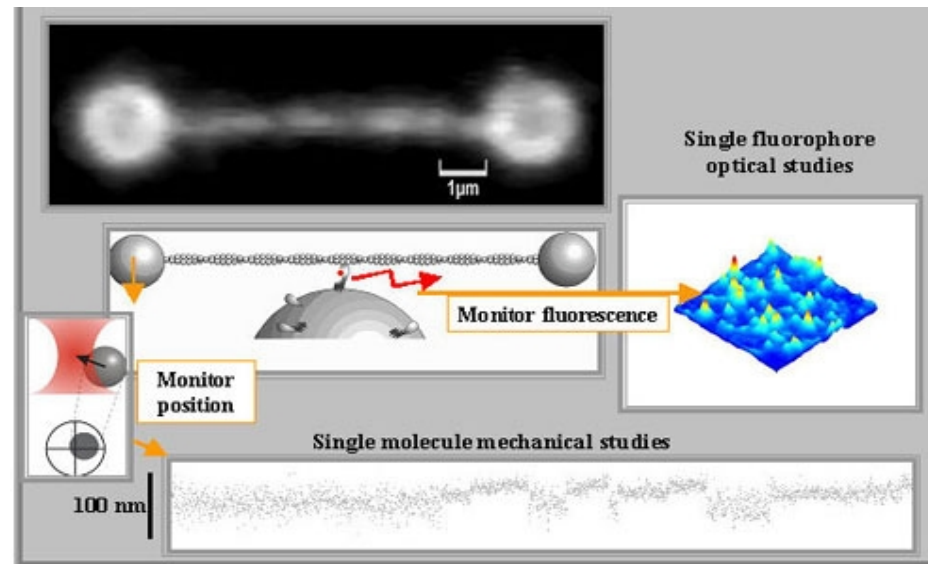


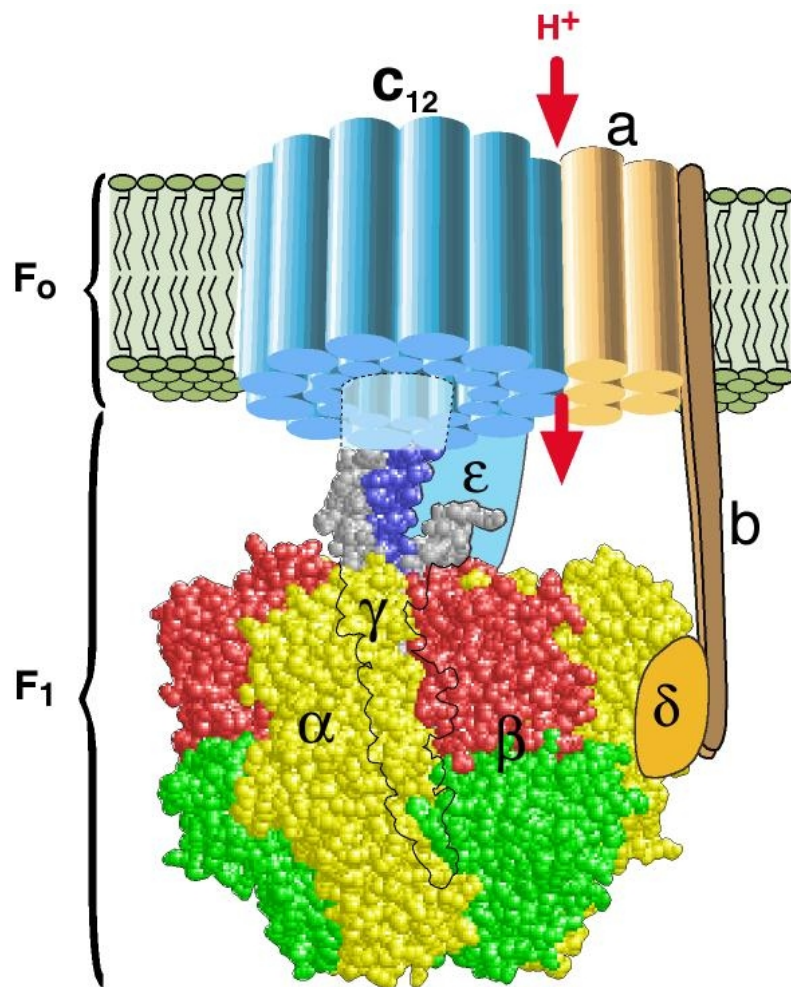
# *Muscle structure*



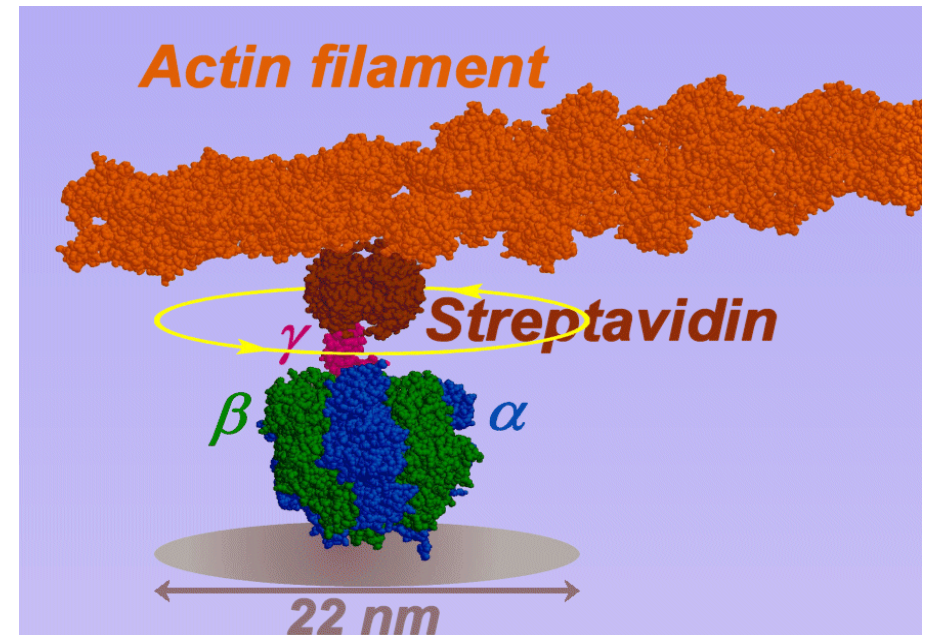
# *Mesure du pas de moteurs non processifs*



# *ATP synthase*



H. Wang and G. Oster (1998). Nature 396:279-282.



Kinosita

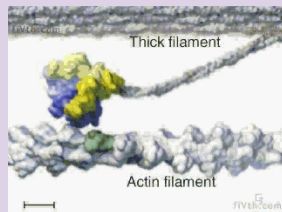


# Molecular motor functions

## Motor proteins

- Muscle contraction (myosin II)
- Cilia and axonemes (Dynein)
- Mitosis
- Intracellular transport (kinesin, myosinV)
- Inner ear hair cells (Myosin 1c)
- Rotating motors

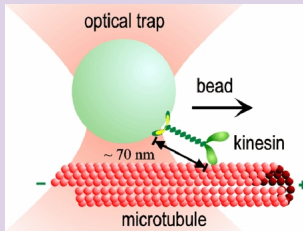
## Motor structure



Vale

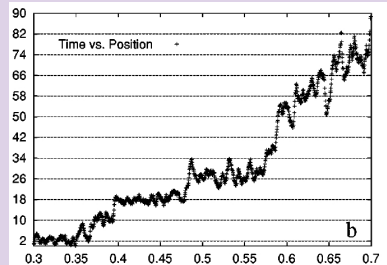
# Single molecule experiments

## Processive motors, Bead assays



- Processivity length  $\sim 1 \mu m$
- Stall force 6pN **Block**
- Velocity  $1 \mu m/s$

## Motor steps

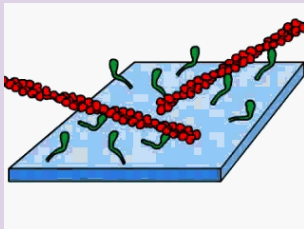


## Cappello

- Steps at the period of microtubule
- Existence of backward steps
- Processivity 200 steps

# Processivity and motility assays

## Motility assay



## Processivity

- On and off rates  $t_{on} = k_{off}^{-1}$ ,  $t_{off} = k_{on}^{-1}$
- Duty ratio  $r = \frac{t_{on}}{t_{on} + t_{off}} = \frac{k_{on}}{k_{on} + k_{off}}$
- Fraction of bound motors  $r$ ,  $1/r$  motors required on the filament
- Myosin are non-processive  $r = 0.02$ . Myosin filaments