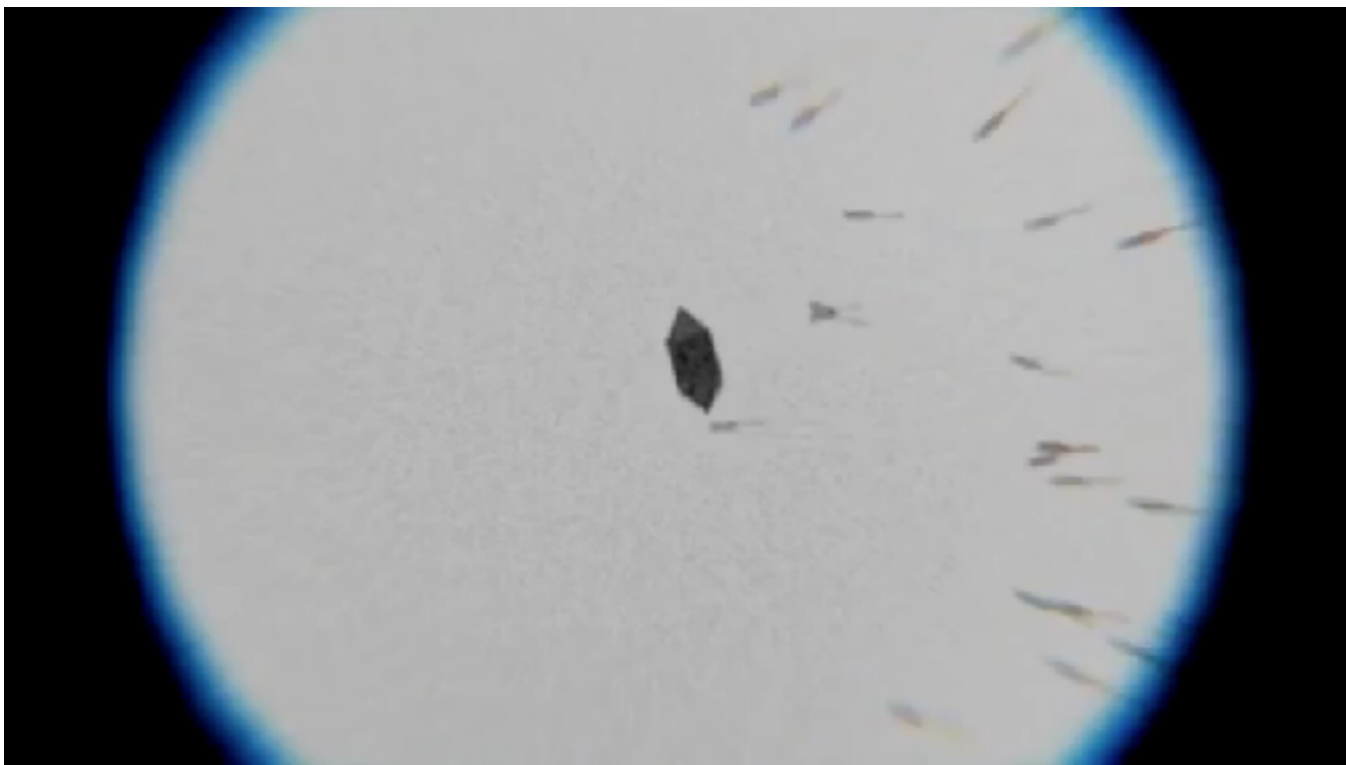


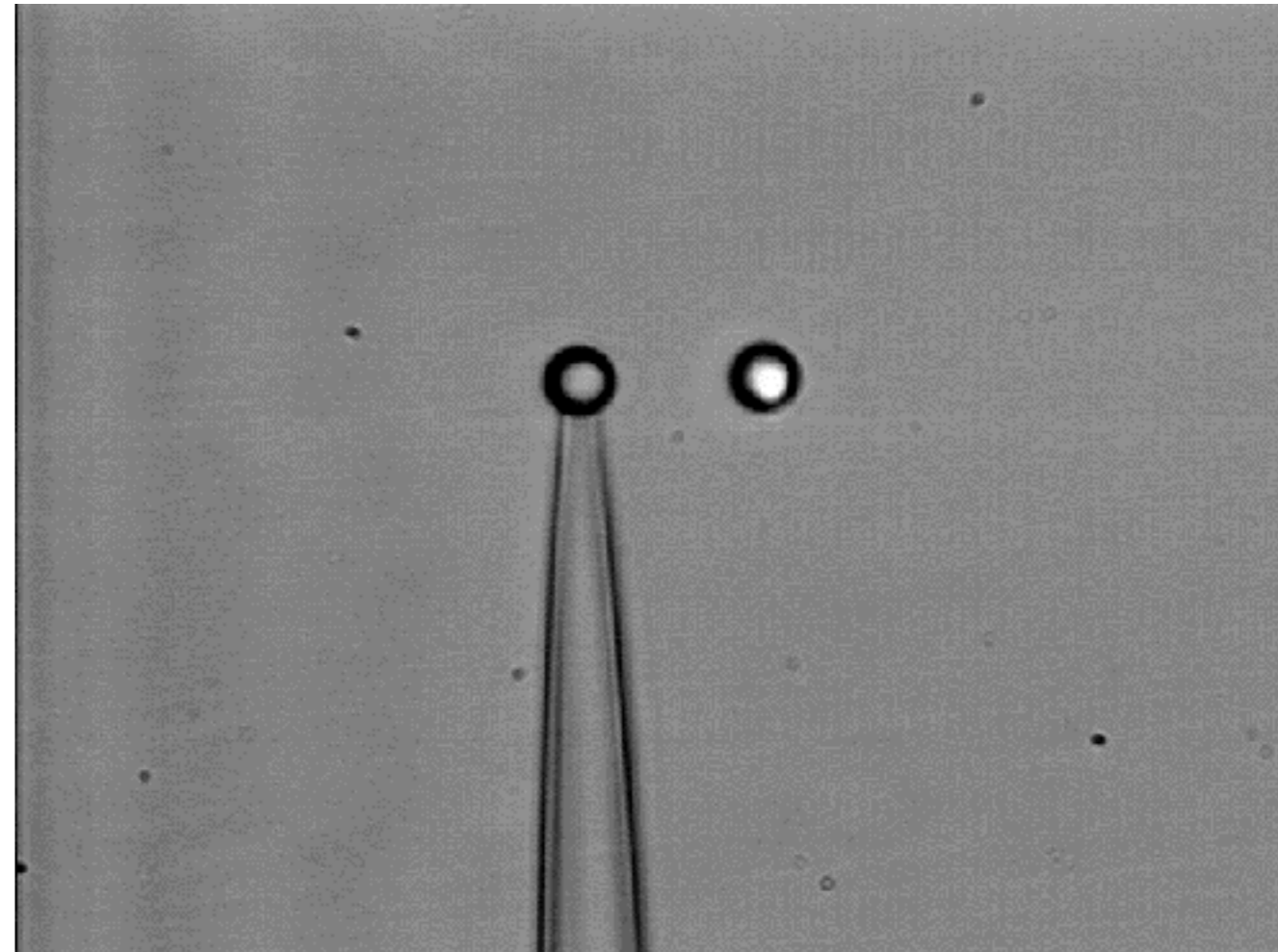
# Physics 1A - Lecture 2

## Average velocity and forces

*E. coli* chemotaxis



Optical trap = “spring” system



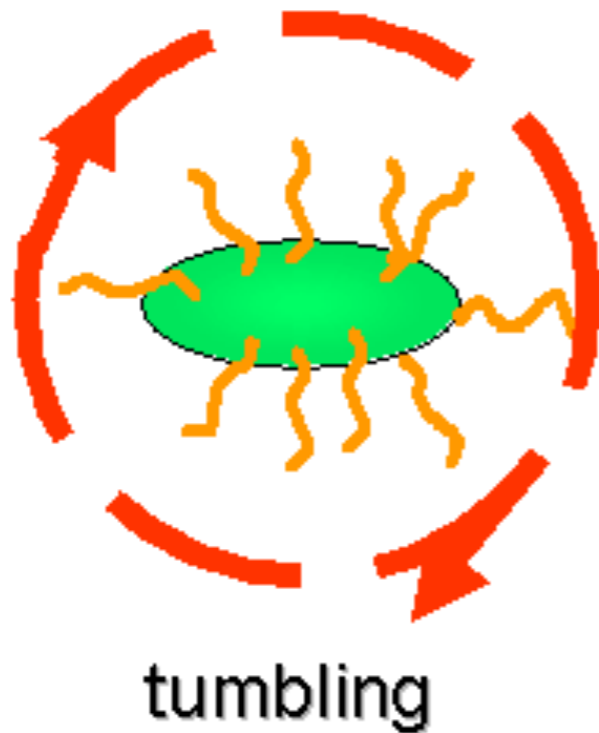
16 November 2016

# Chemotaxis: Bacterium *E. coli* swimming towards sugar crystal

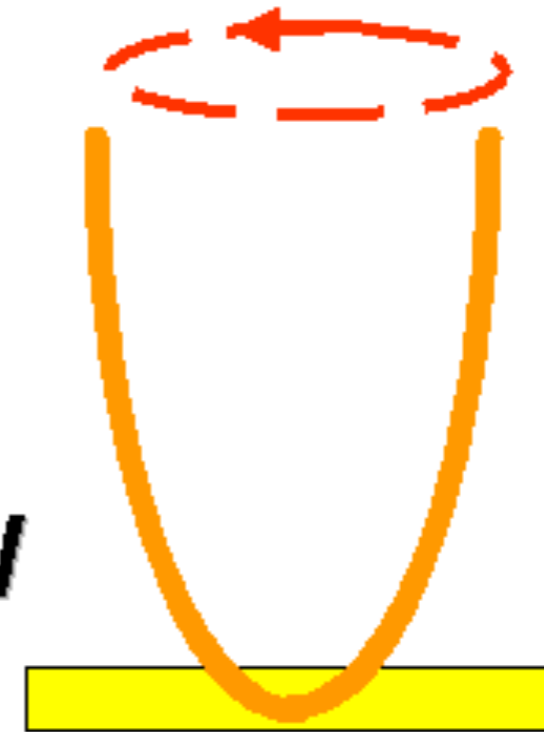


# Chemotaxis: Bacterium *E. coli* swims towards food

Correlation of swimming behaviour and flagellar rotation in *E. coli*



**CCW**



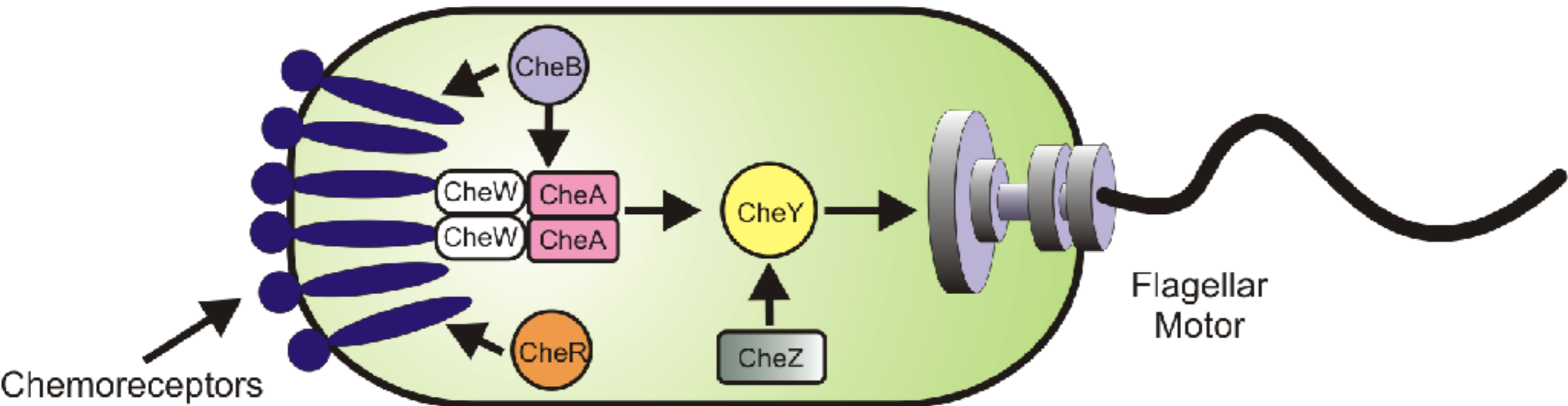
**CW**



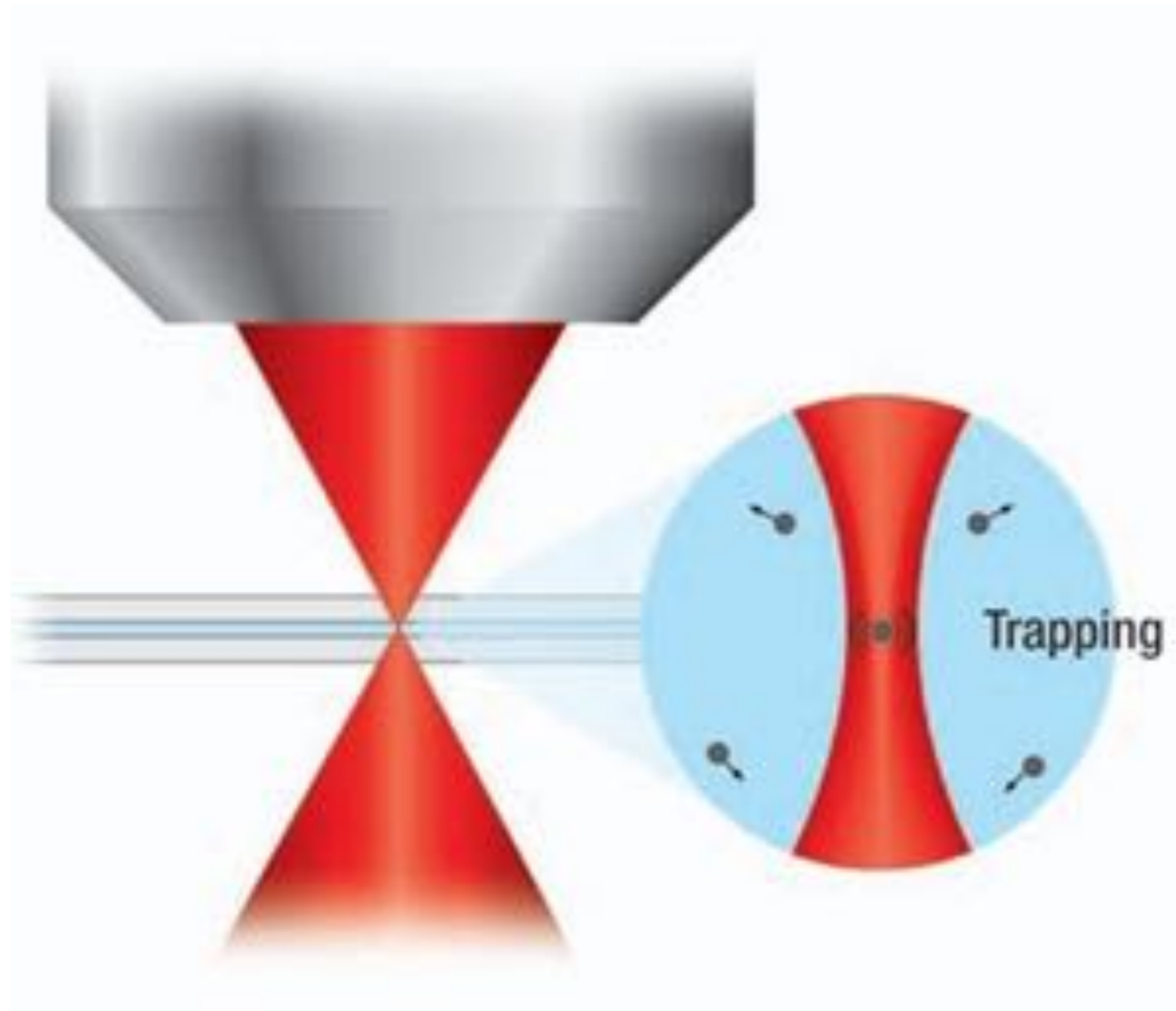
(**CCW**= counter-clockwise, **CW**= clockwise)

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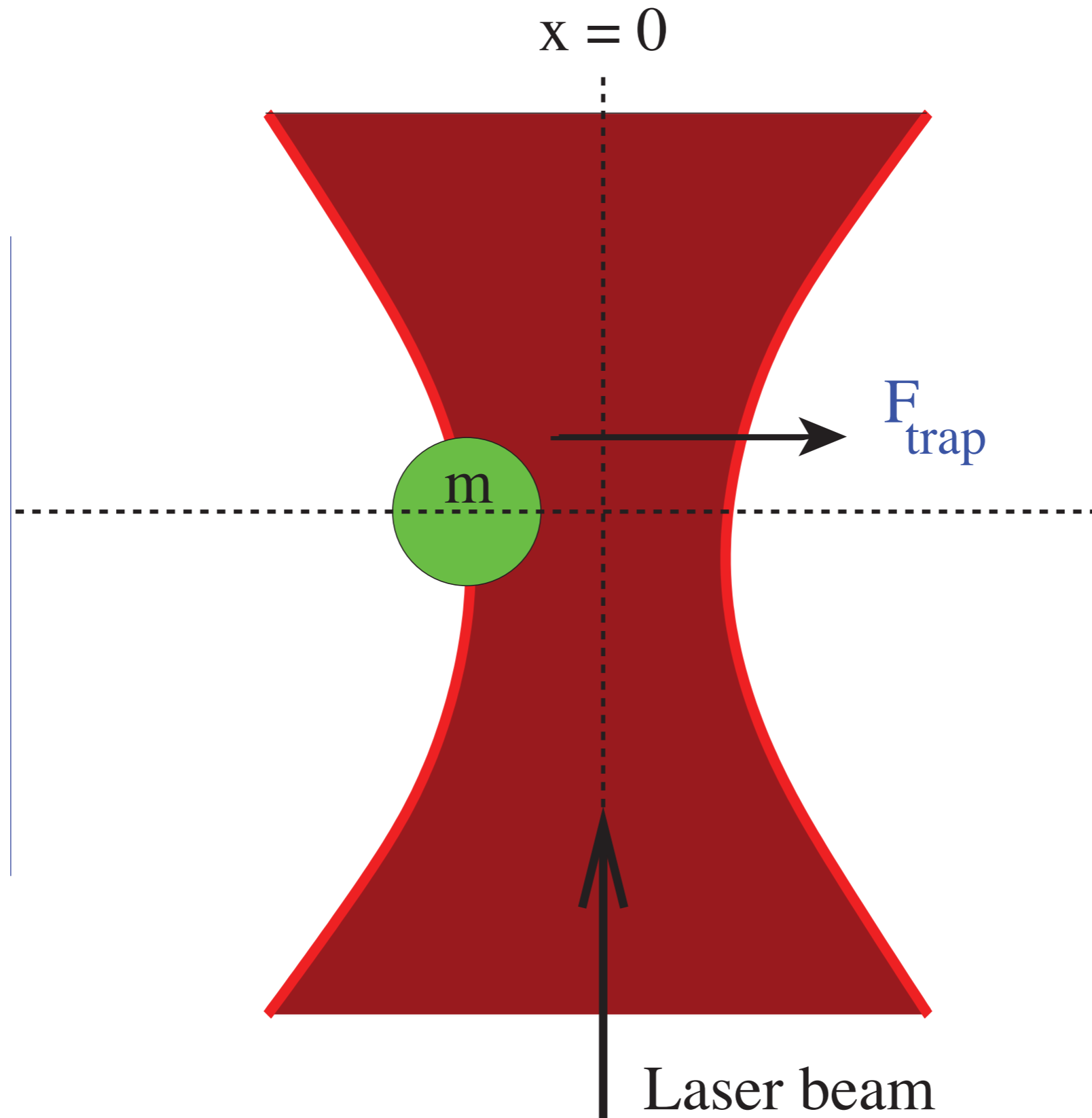
# Chemotaxis: Bacterium *E. coli* swims towards food



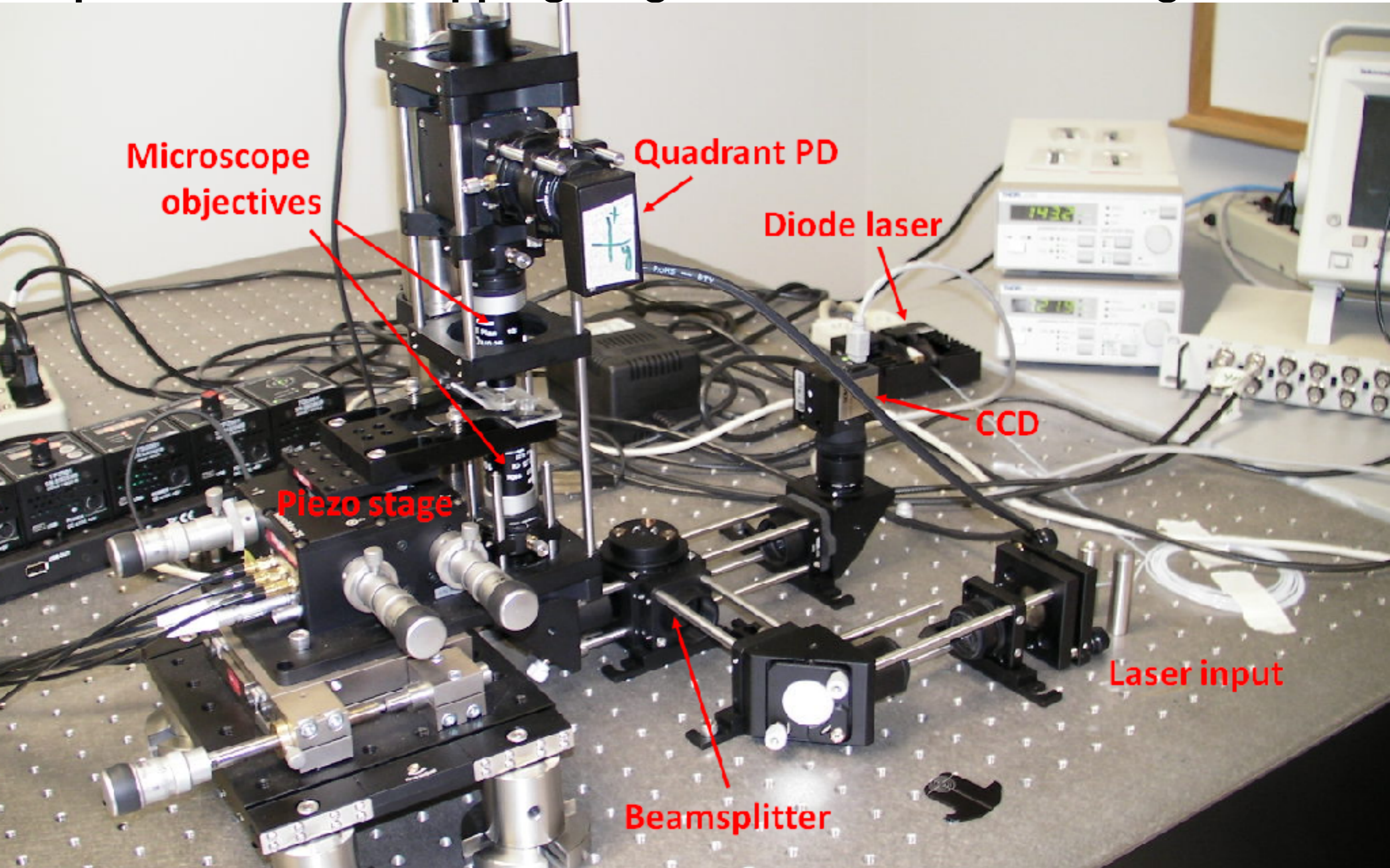
# Optical tweezer: Trapping single molecule with laser light



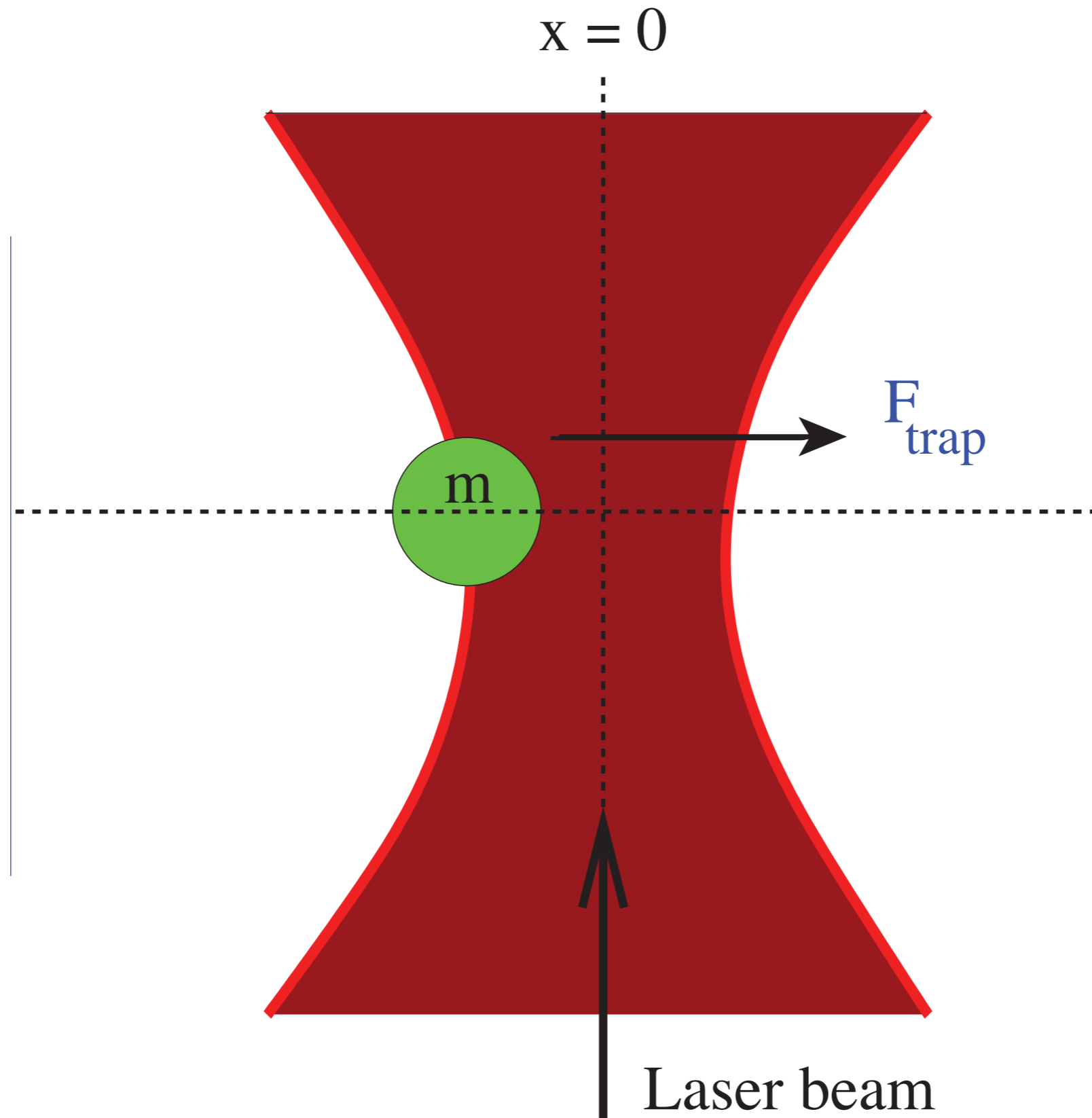
# Optical tweezer: Trapping single molecule with laser light



# Optical tweezer: Trapping single molecule with laser light

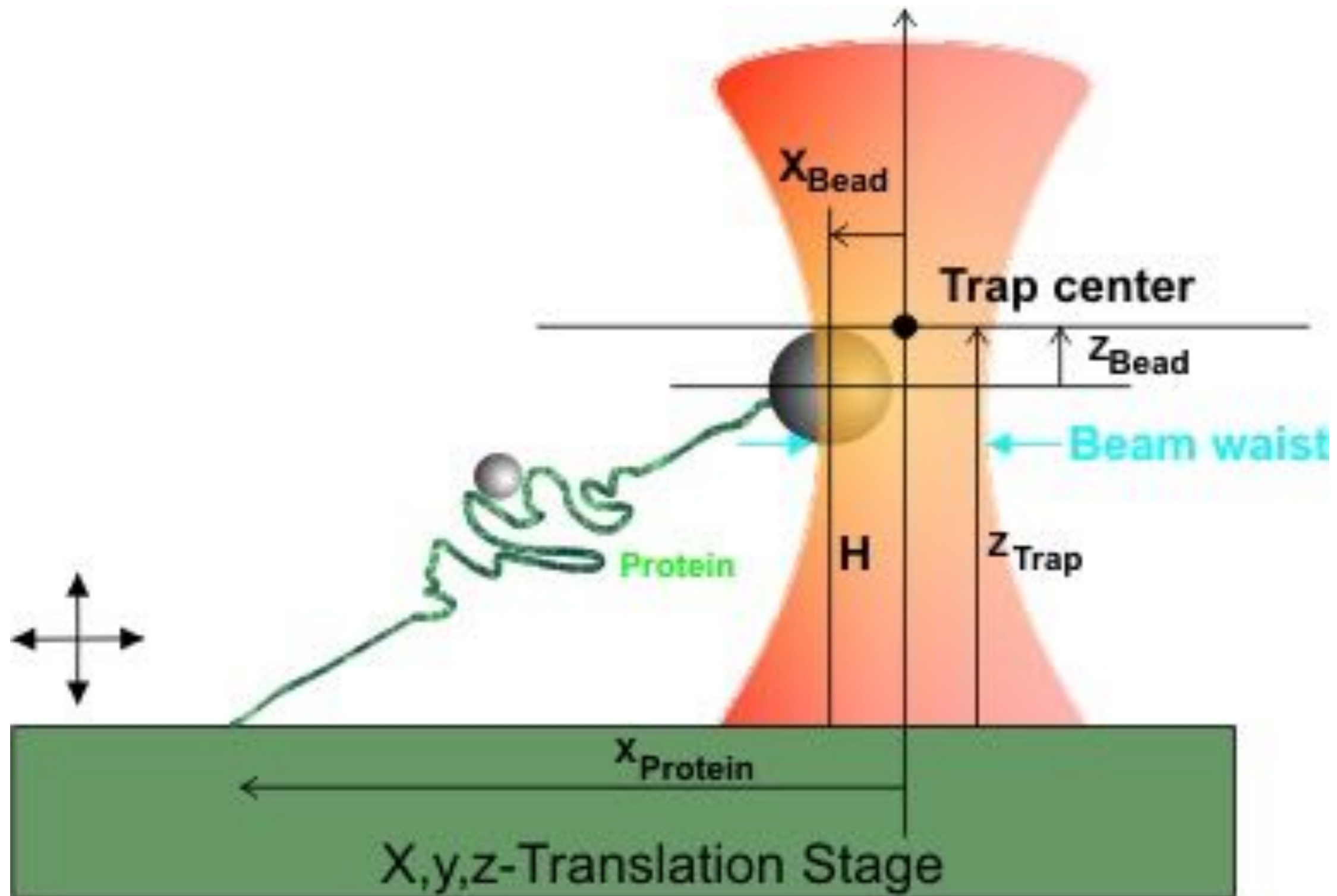


# Optical tweezer: Trapping single molecule with laser light

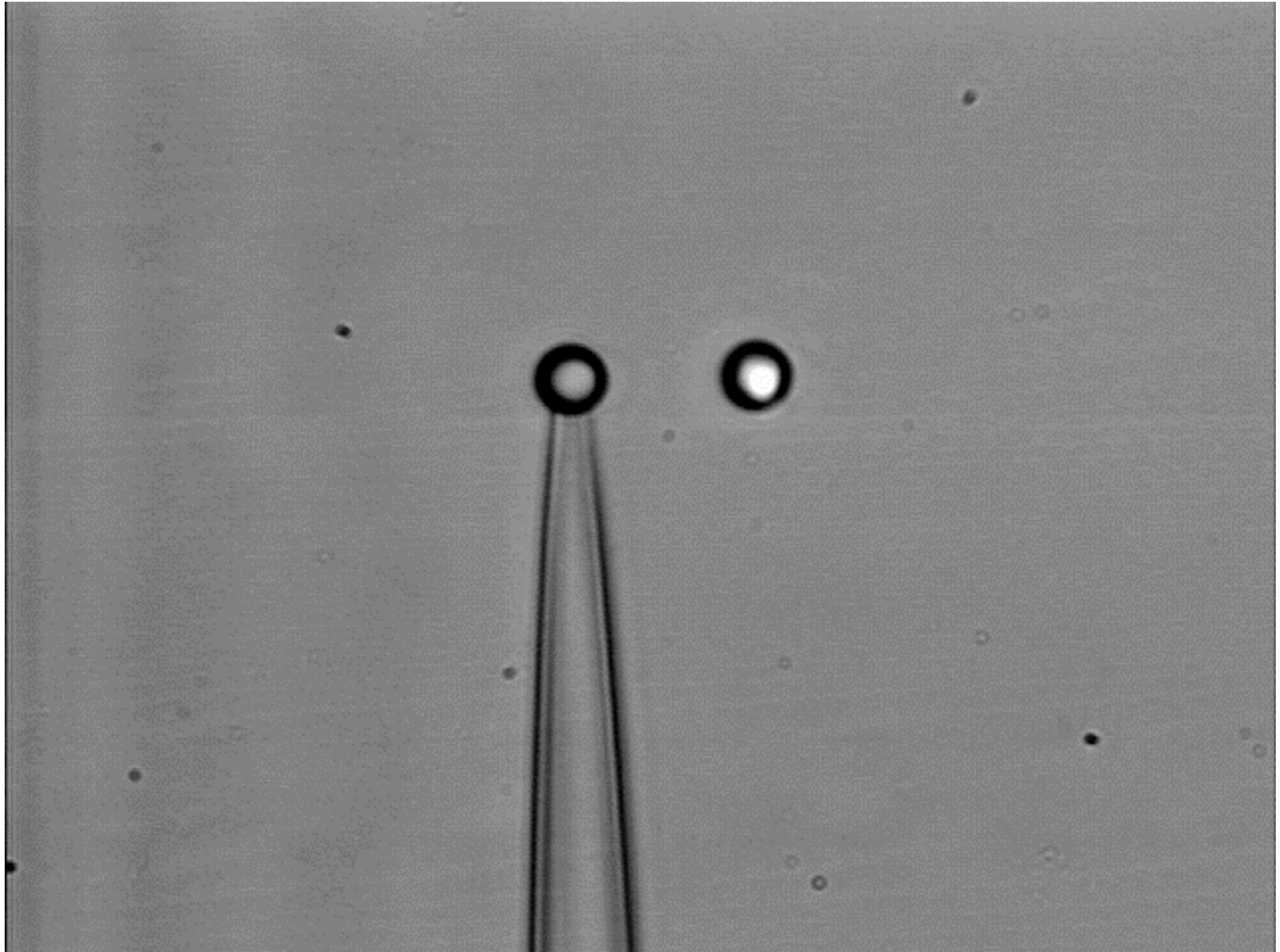




# Optical tweezer: Trapping single molecule with laser light

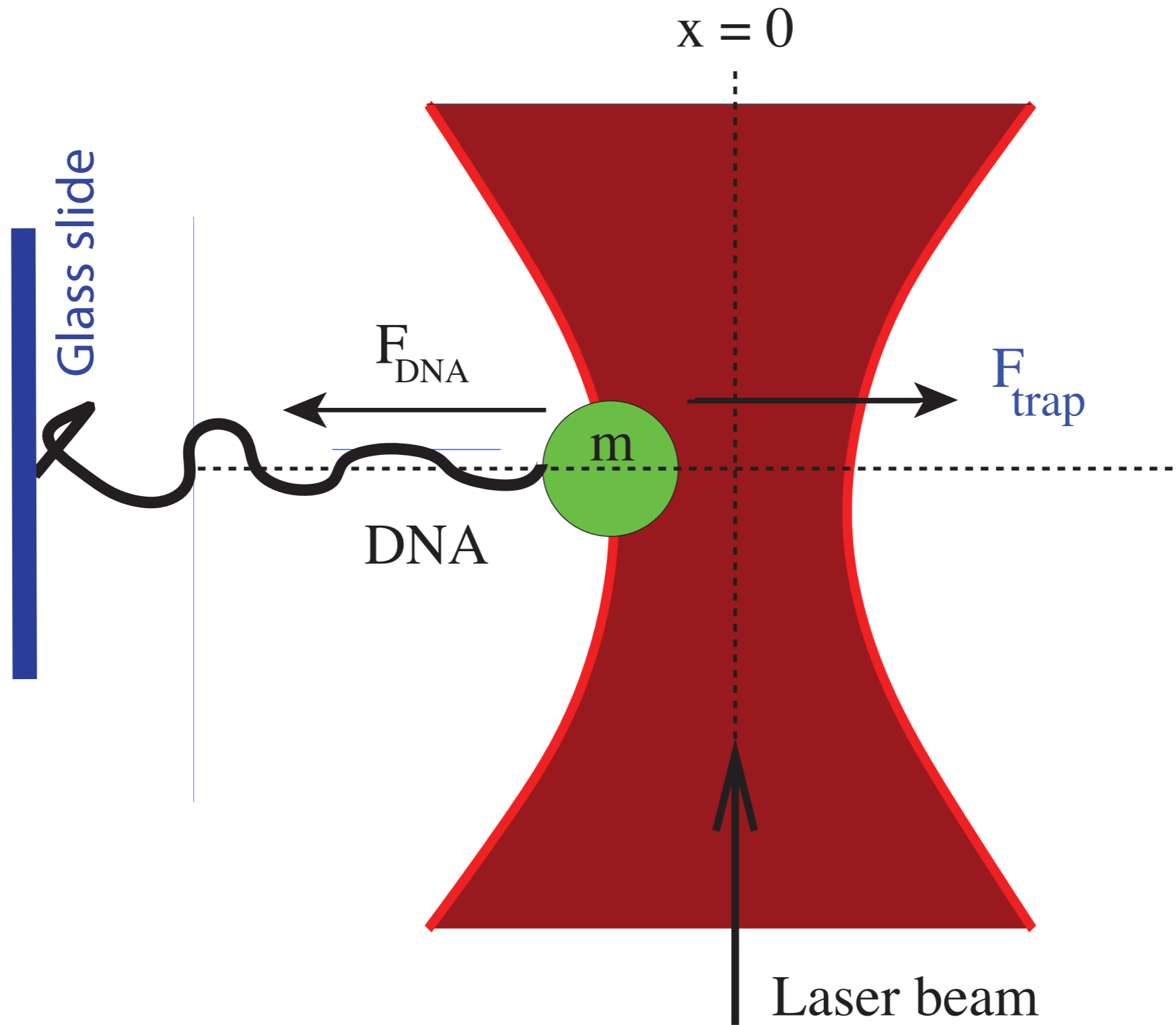


# Optical tweezer: Trapping single molecule with laser light



source: <http://www.atsweb.neu.edu/mark/opticaltweezersmovies.html>

# Optical tweezer: Trapping single molecule with laser light



# Optical tweezer: Trapping single molecule with laser light

