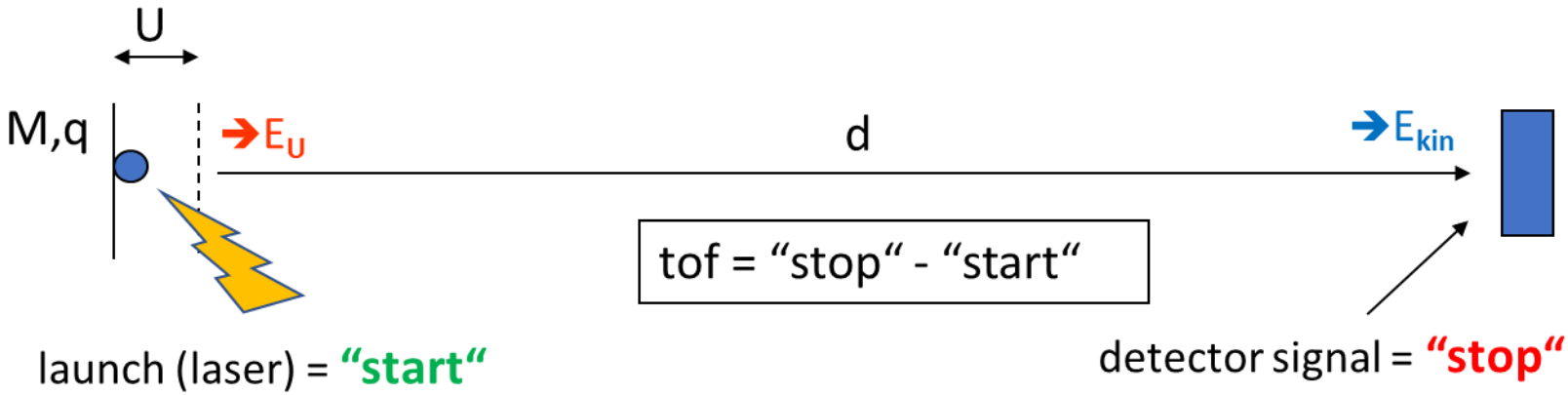
separation according to velocity of molecules

acceleration energy: $E_U = q\,U$ (no mass term !)

kinetic energy: $E_{kin} = 1/2\,M\,v^2$

$$E_U = E_{kin} \Rightarrow v = \sqrt{\frac{2qU}{M}} \Rightarrow tof = d\sqrt{\frac{M}{2qU}} \Rightarrow \boxed{tof \approx \sqrt{\frac{M}{q}}}$$



MALDI: Matrix Assisted Laser Desorption and Ionization

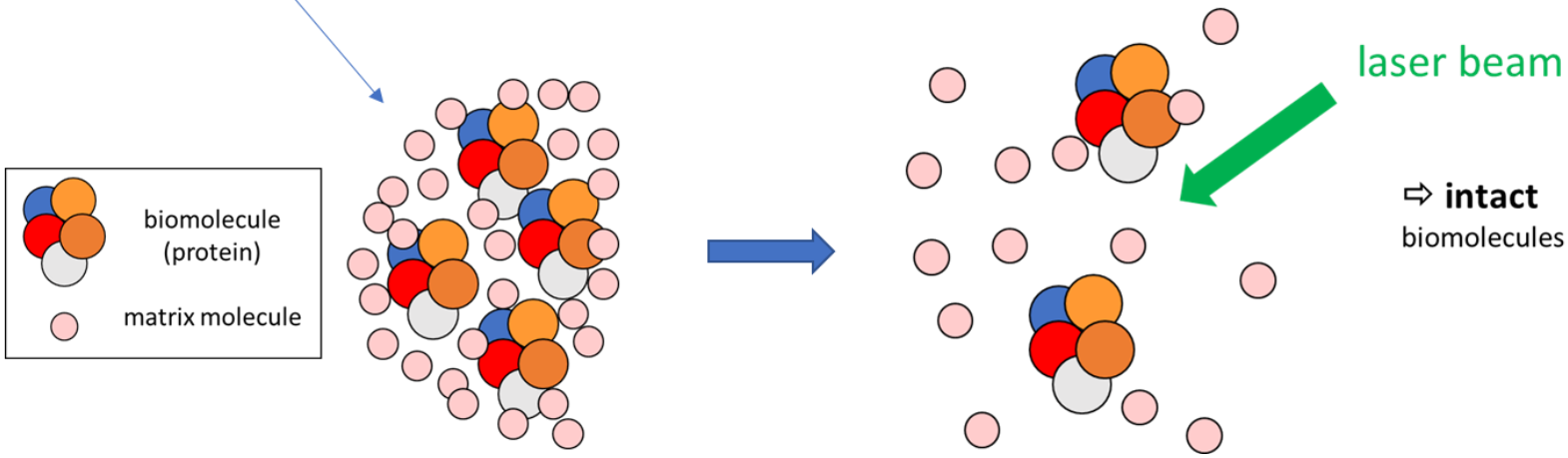
the laser gives the "start" signal in the time-of-flight mass spectrometer

MALDI: Matrix Assisted Laser Desorption and Ionization

Karas & Hillenkamp (1984)

"biomolecules embeded in laser light sensitive matrix"

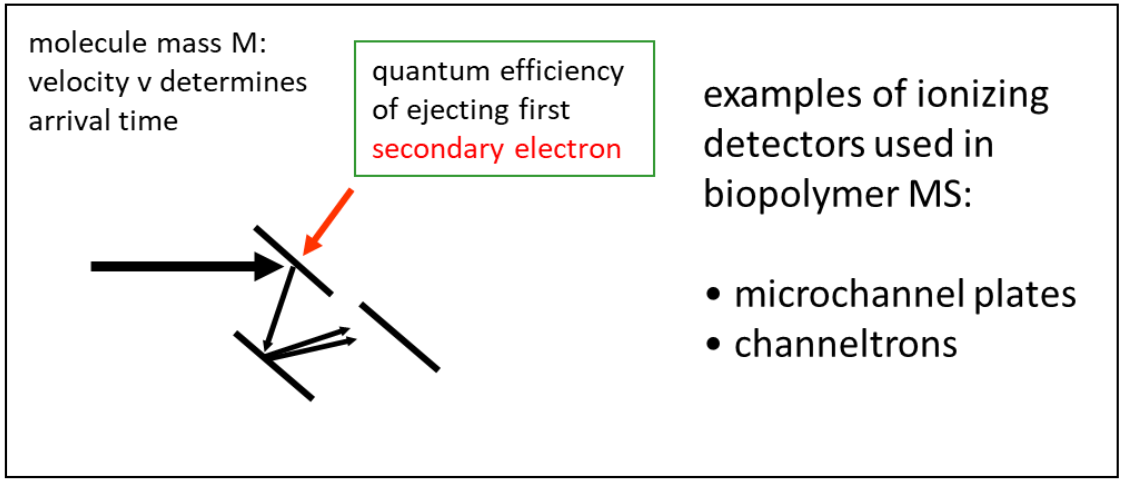
- laser energy absorbed by matrix
- "mechanical" momentum transfer of matrix molecules to the massive biomolecules



the detector gives the "stop" signal in the time-of-flight mass spectrometer

Ionizing detector

operating at
room temperature



CryoDetector

operating at
temperatures < 1 K