

# 超伝導検出器の生体分子研究利用



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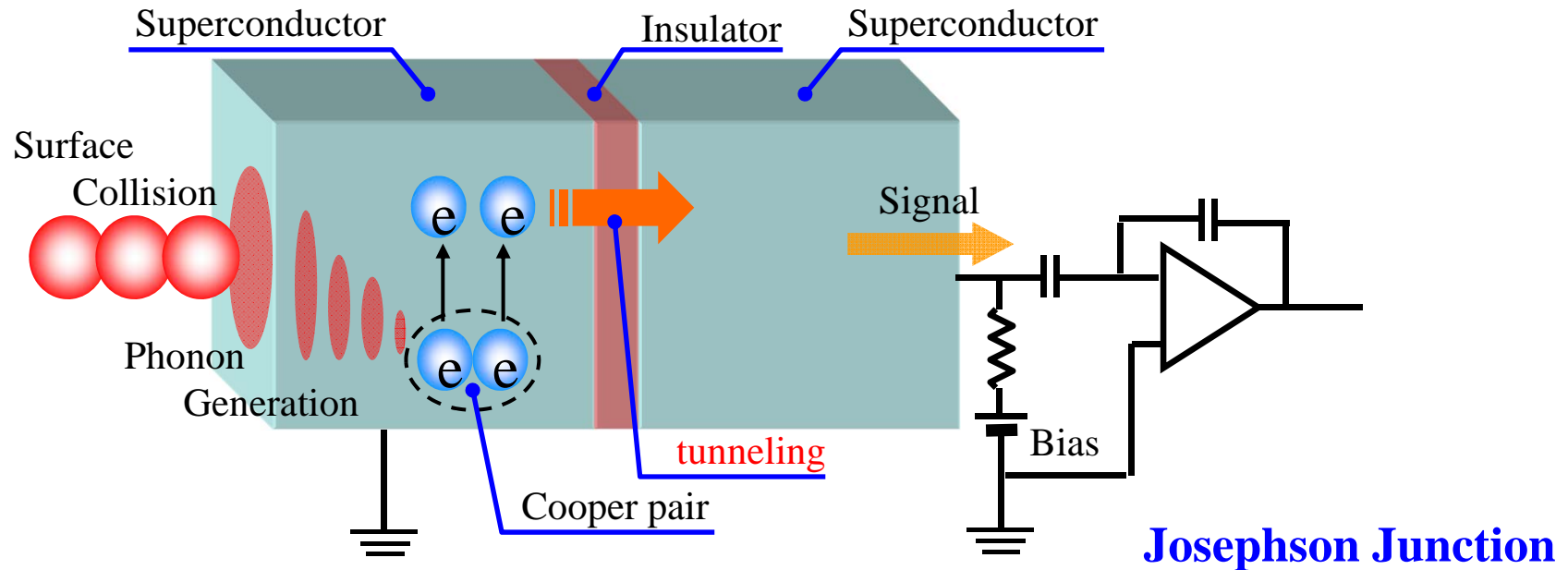
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京大: 斉藤、間嶋 KEK: 田邊 筑波大: 笹

光量子計測器開発推進室kick-off meeting 2015/11/30

# トンネル接合型超伝導検出器

## 超伝導検出器

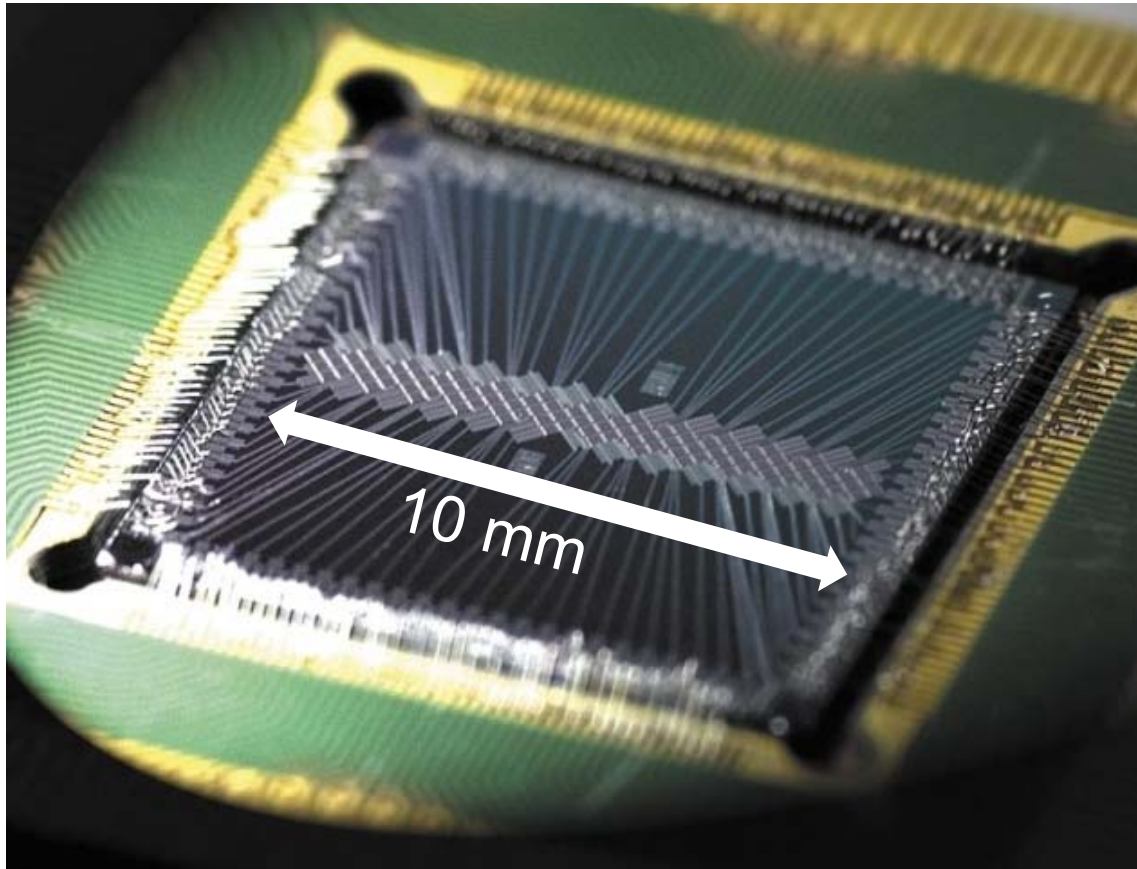


Binding energy of cooper pair: 3.1meV in (Nb)

**Energy measurements of keV particles**

# STJ array

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100x 100um x 100um  
detectors

# 真の質量分析

STJを用いた  
飛行時間型質量分析装置

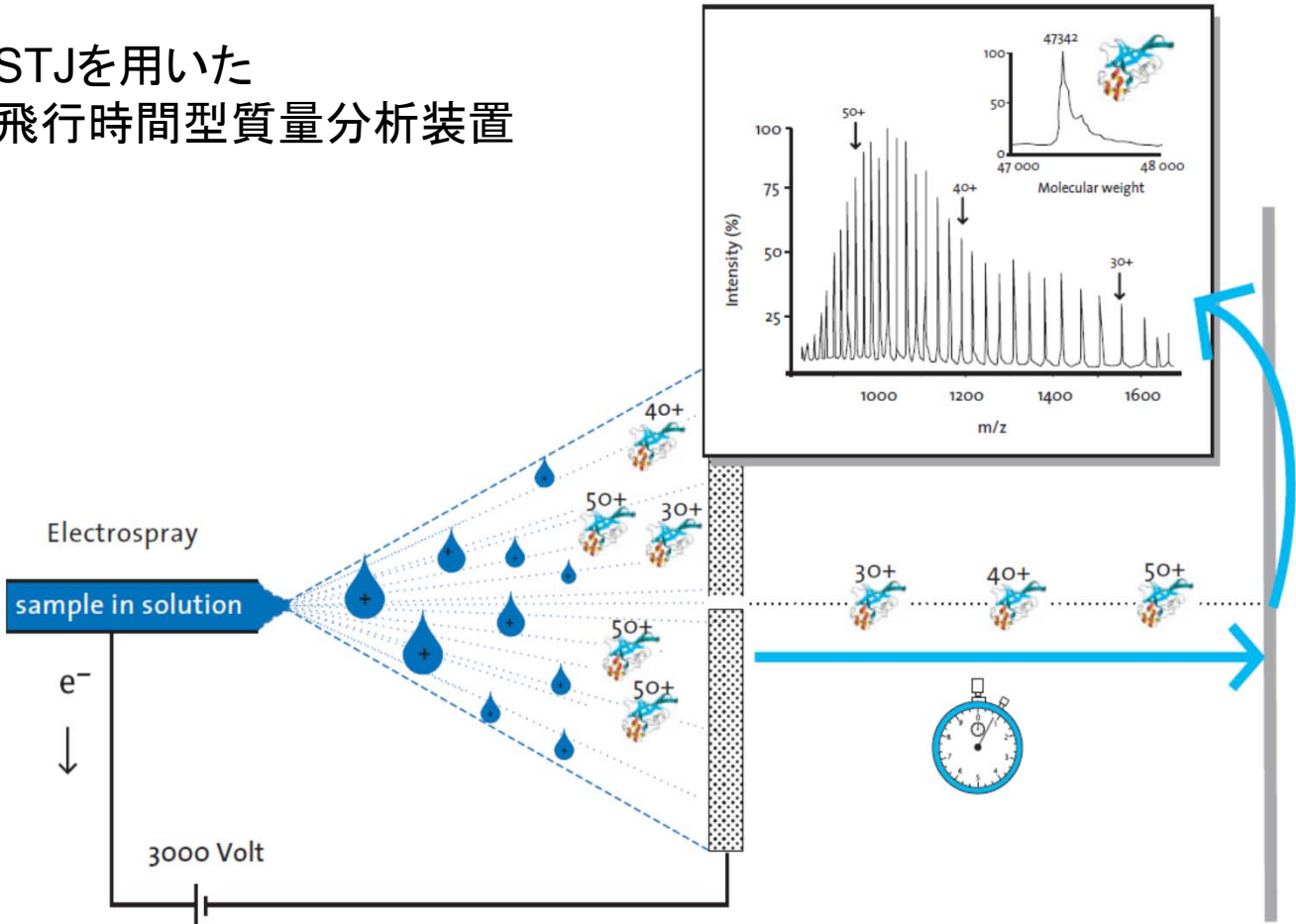
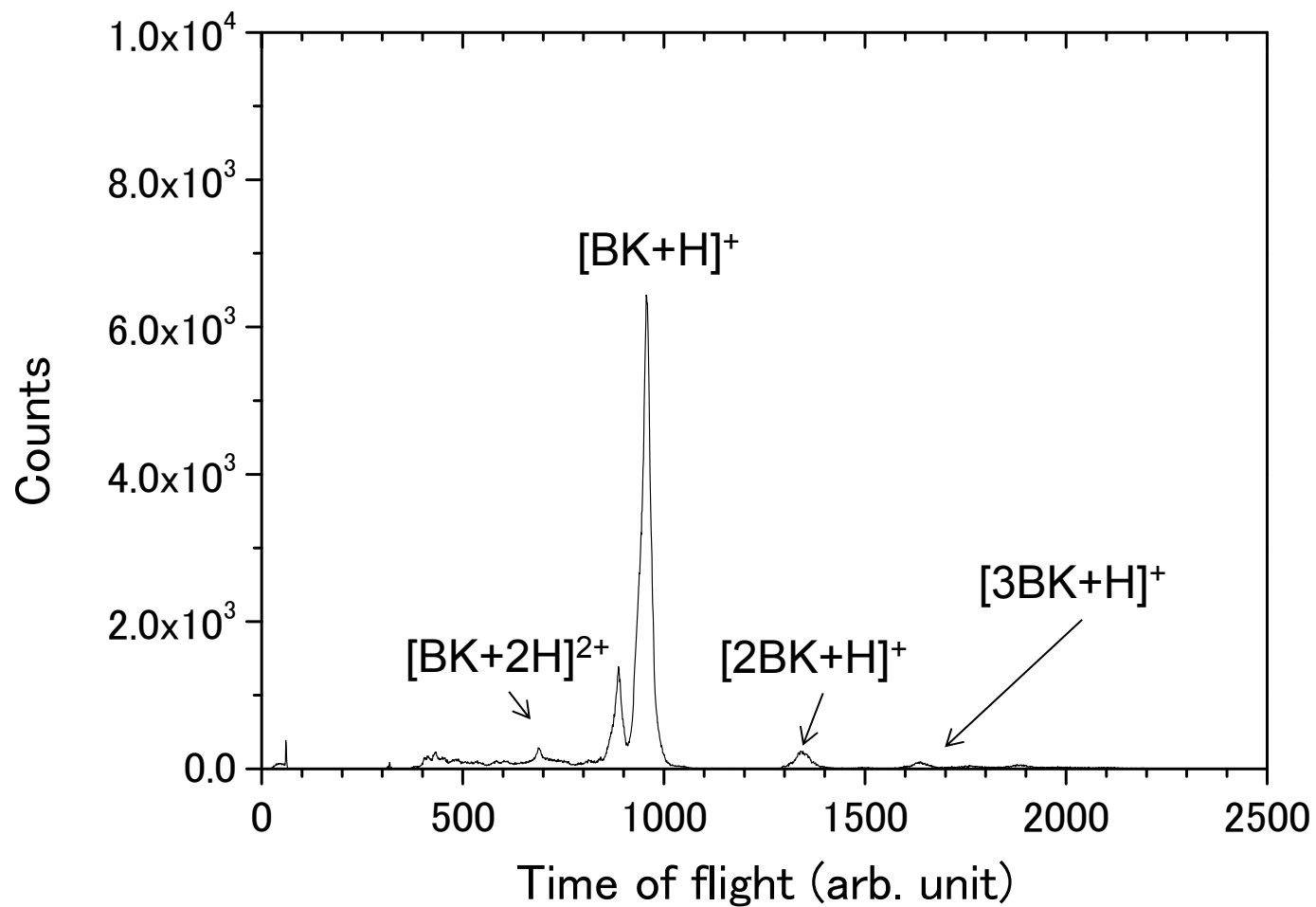


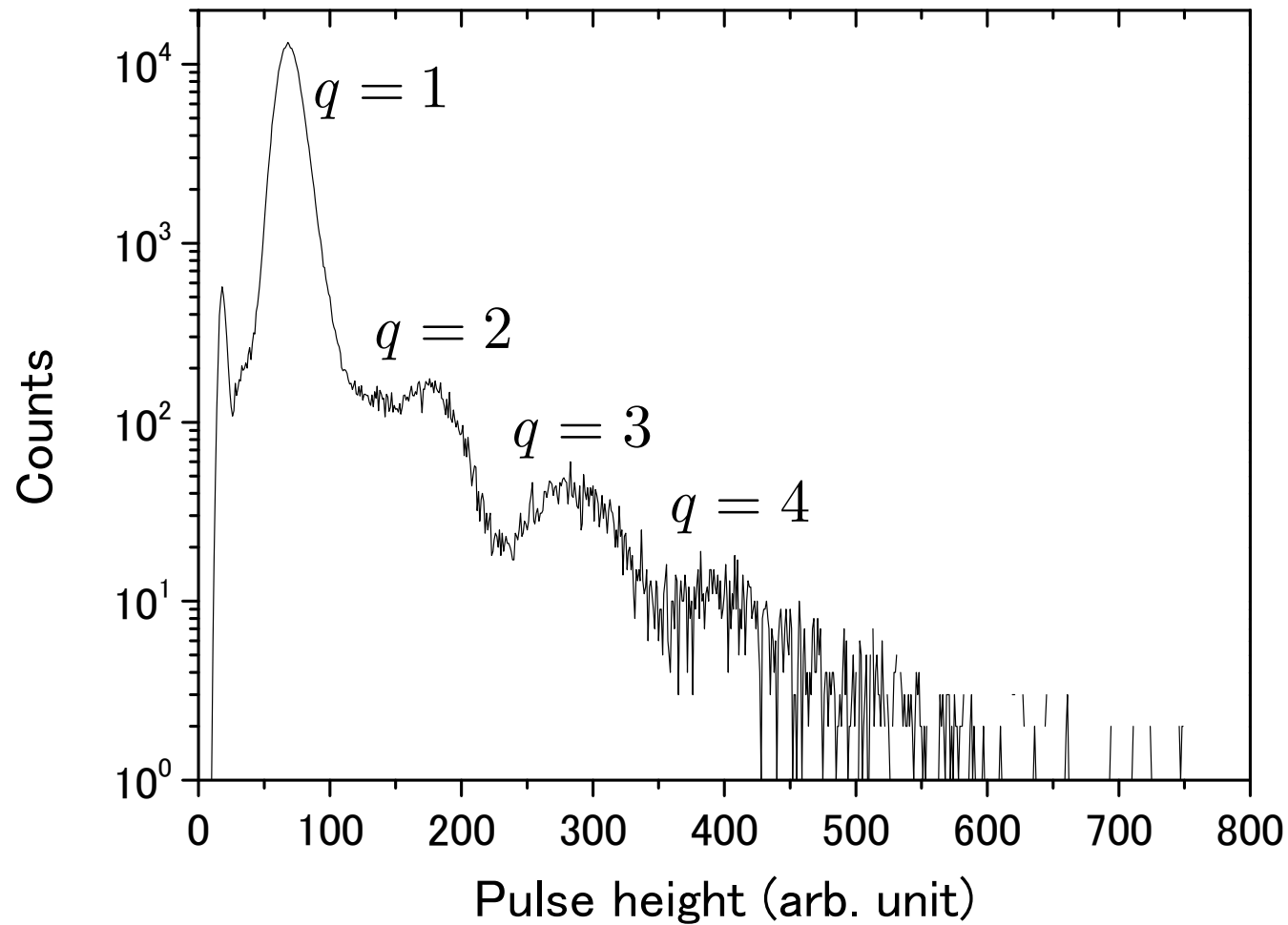
Figure 1. The electro spray process.

# TOFスペクトル

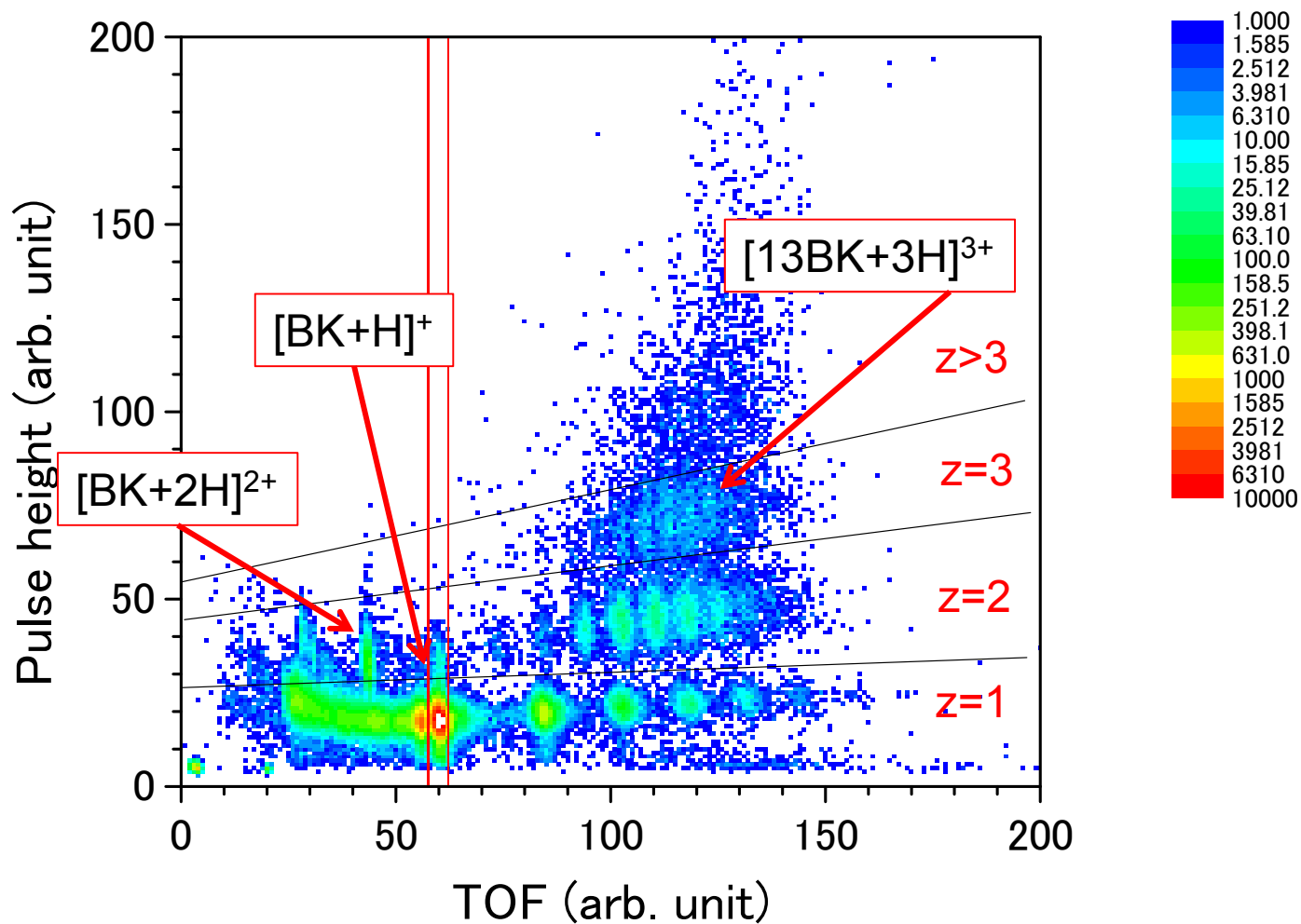


# Pulse height distribution

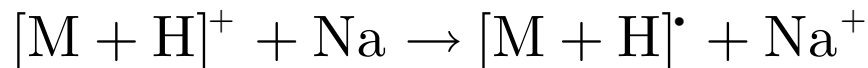
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# 2次元スペクトル

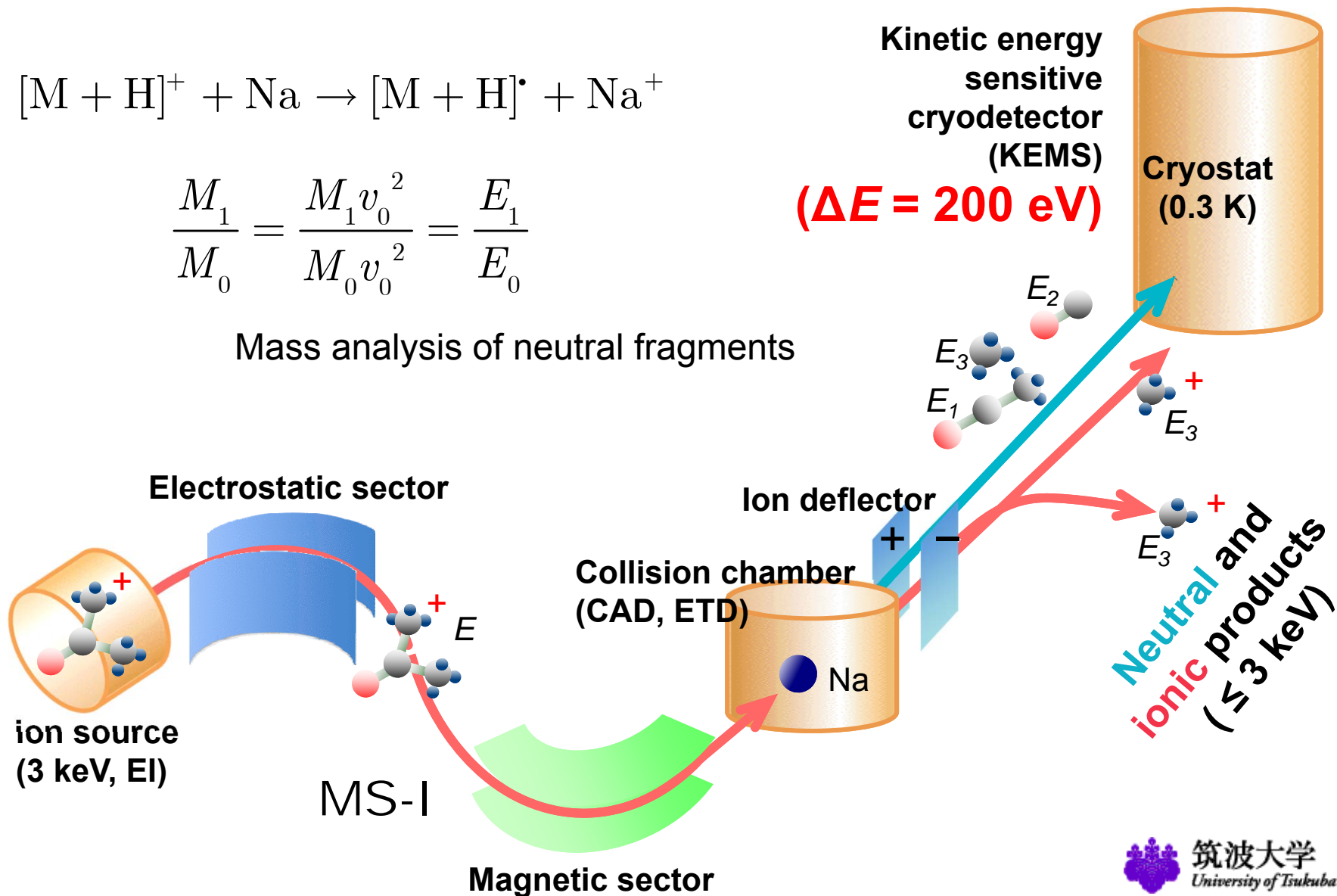


# Kinetic energy (KE) spectroscopy for neutrals in keV



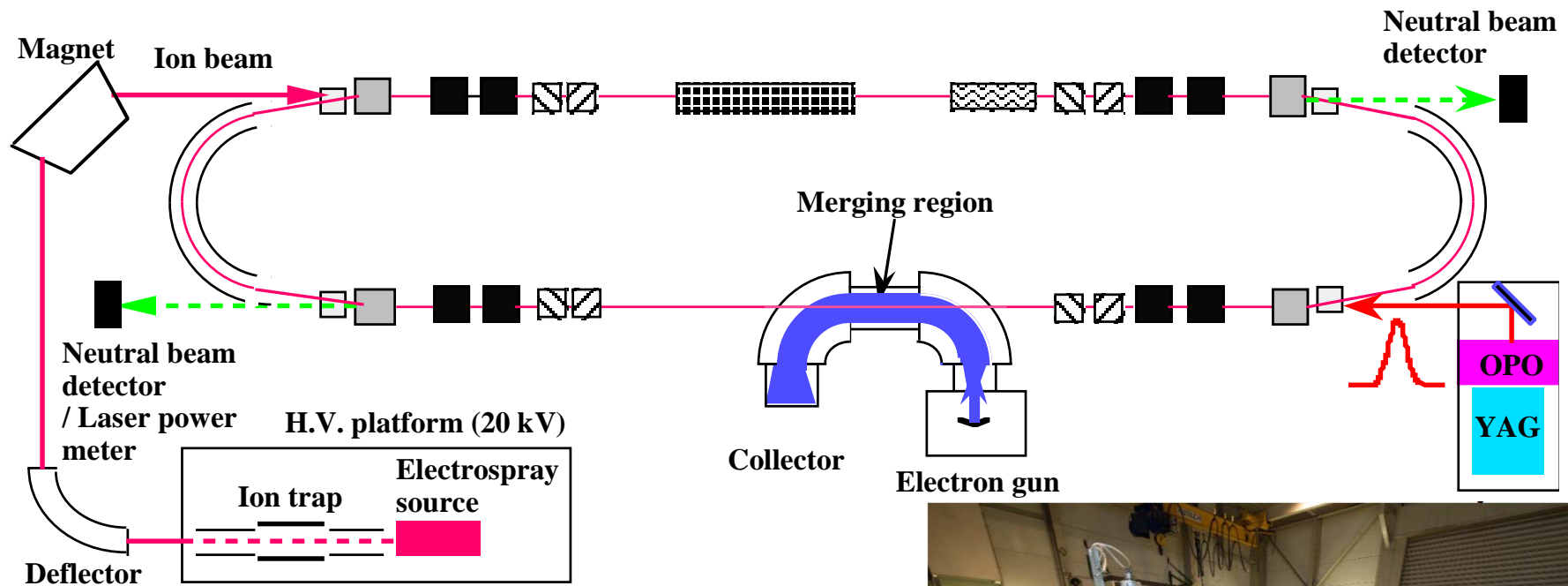
$$\frac{M_1}{M_0} = \frac{M_1 v_0^2}{M_0 v_0^2} = \frac{E_1}{E_0}$$

Mass analysis of neutral fragments





# KEK ESring

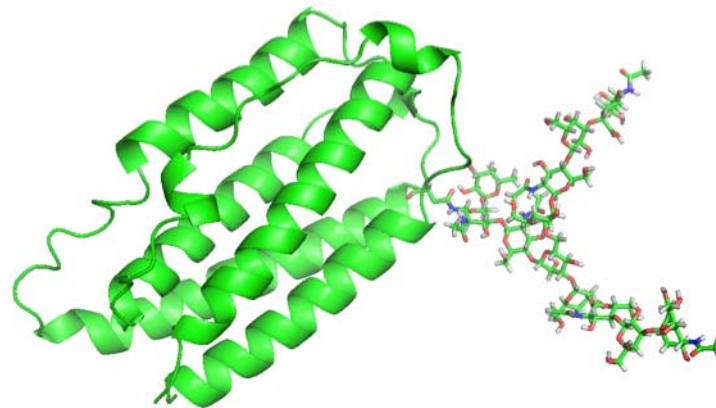


励起生成物の寿命測定



# 糖ペプチド

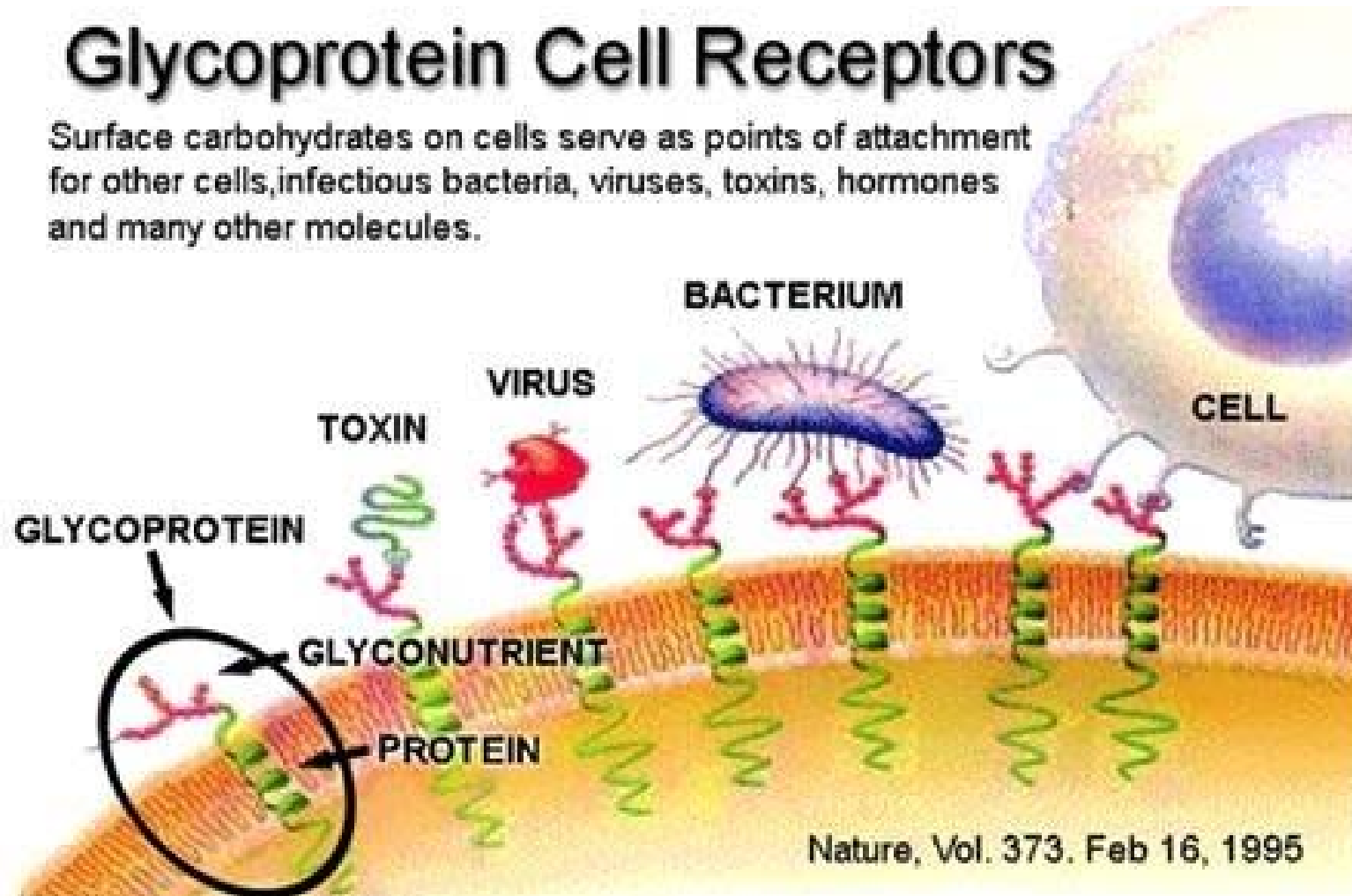
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Glycoprotein =  
conjugate molecule of polypeptide  
and sugar chains

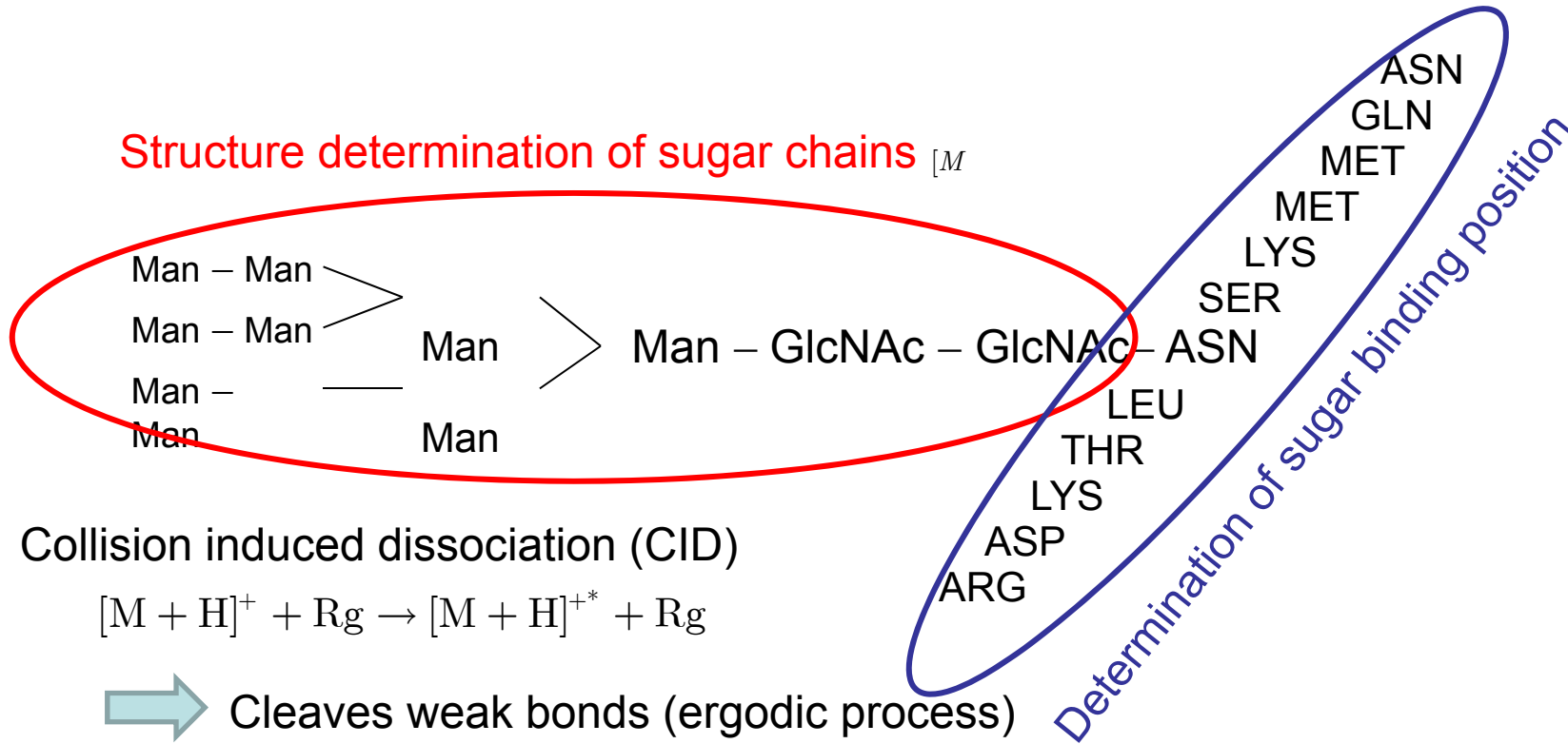
# Glycoprotein Cell Receptors

Surface carbohydrates on cells serve as points of attachment for other cells, infectious bacteria, viruses, toxins, hormones and many other molecules.

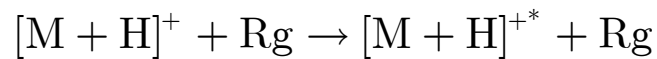


# 糖ペプチドの構造解析

## Structure determination of sugar chains $[M]$

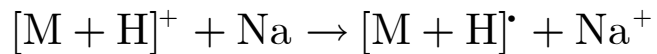


### Collision induced dissociation (CID)

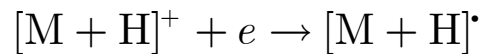


➡ Cleaves weak bonds (ergodic process)

### Electron transfer dissociation (ETD)

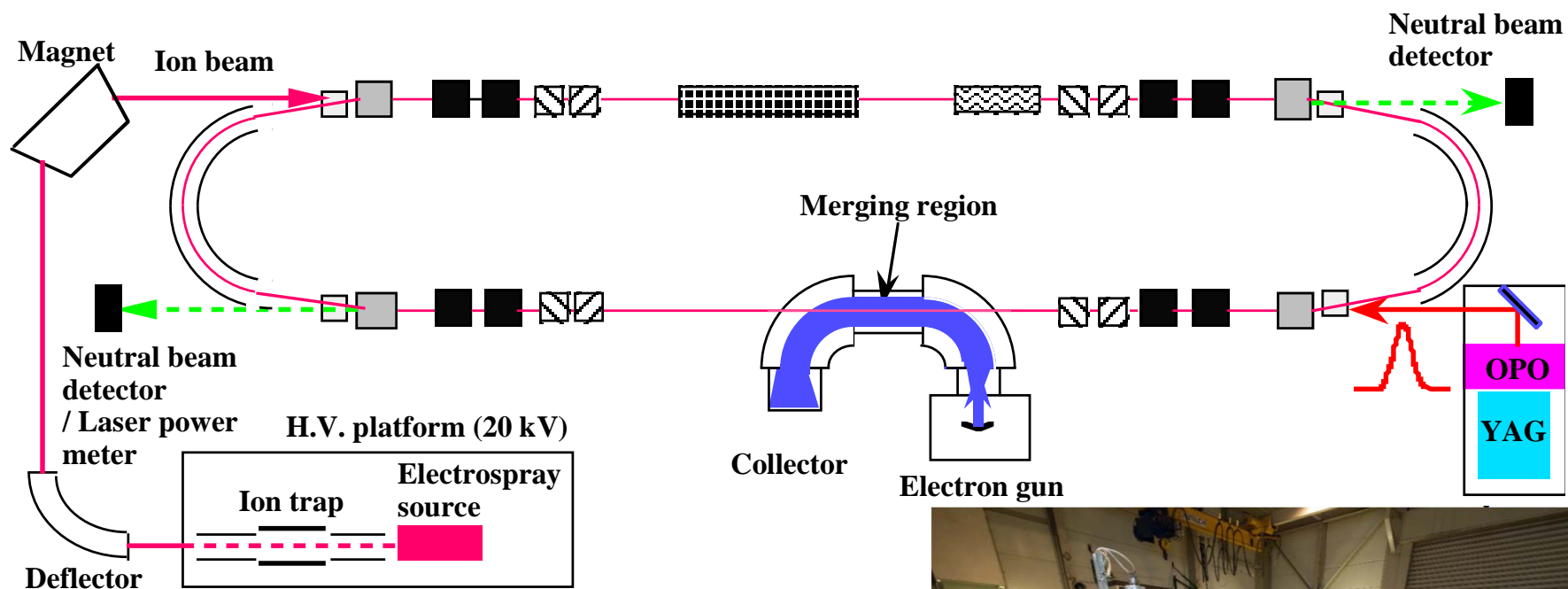


### Electron capture dissociation (ECD)



Cleaves peptide bonds  
 (c and z ions)  
 (nonergodic process)

# KEK ESring



分解能の向上と有感面積の改良が必要

