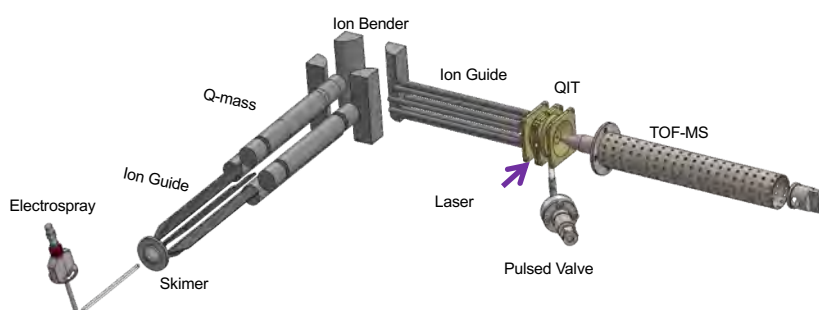
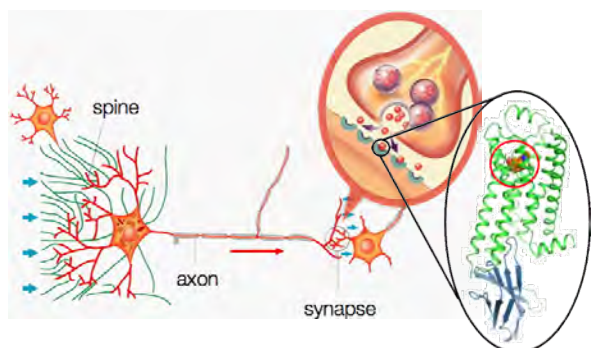


## Probing Molecular Functions by Lasers

Molecular Functions Division, Laboratory for Chemistry and Life Science

<http://www.csd.res.titech.ac.jp/index.html>

- Cold Ion Trap Laser Spectroscopy for Biomolecules
- Bottom-up Approach to Molecular Recognition
- Picosecond Laser Spectroscopy for Chemical Reactions
- Development of Multi-color Laser Spectroscopy

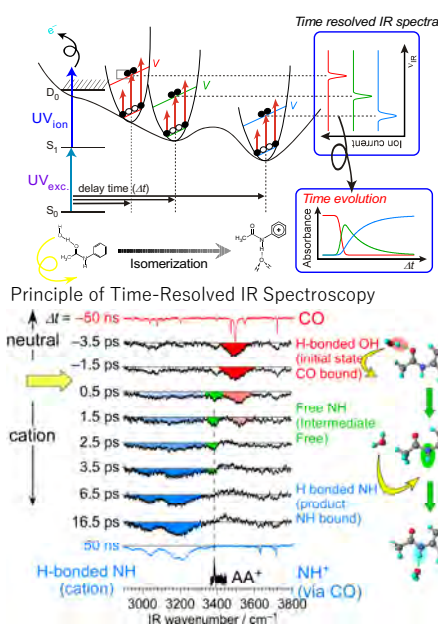
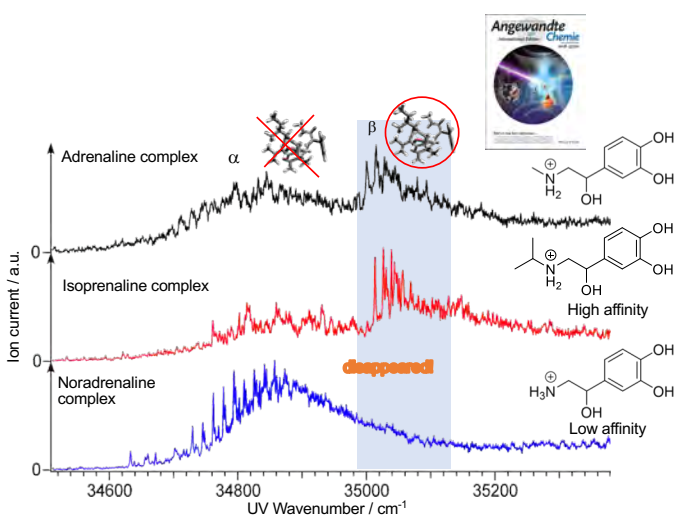


### Molecular Recognition in Neurotransmission

- Neurotransmitters / Receptors are Key & Lock relation
  - Fundamental Mechanism has not been established.
  - Bottom-up approach
- Study on molecular recognition by spectroscopy of binding motif in receptors and ligands

### Electrospray/Cold Ion Trap Laser Spectrometer

- UV/IR spectra of biomolecules at low temperature gas phase
- Clear structural analysis of biomolecules and their clusters



Picosecond Time-Resolved IR Spectra of Acetanilide-Water Cluster

Very Important Paper



### UV Spectra of Binding Motif-Ligand complexes

- Binding motif SIVSF peptide shows natural helix structure only when proper ligands that are recognized by the adrenergic receptor.
- Pentapeptide shows the same molecular recognition as the whole receptor.

### Reaction Dynamics Probed by Three color Picosecond IR Spectroscopy

- Real-time probe of solvation dynamics at molecular level triggered by photoionization.
- Decoupling of electron and proton in H-atom transfer.