Ueda-Kitaguchi Lab

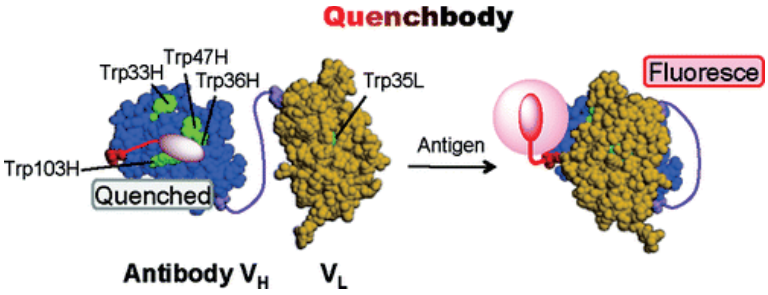
Development of novel biosensors and analytical methods by protein engineering and chemical biology

Molecular Bioscience Division, Laboratory for Chemical and Life Science

http://www.ueda.res.titech.ac.jp/index_en.html

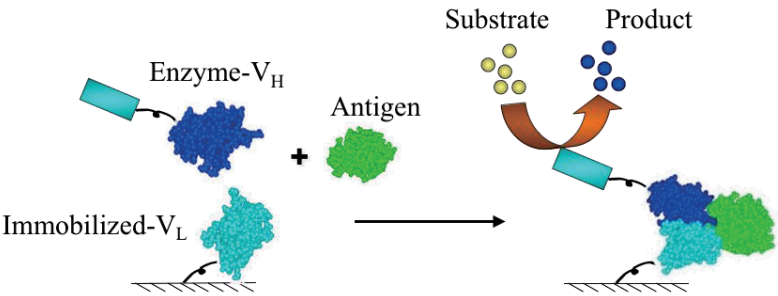
- Immunoassay based on the stabilization of an antibody variable region
- Quench-based antibody sensors showing antigen-dependent fluorescence
- Interaction assay based on the functional complementation of luciferases
- Live-cell imaging by biosensors based on fluorescent proteins

In nature, many proteins exhibit high performances such as molecular recognition ability and catalytic activity. However, natural protein does not always have ideal property from the viewpoint of application to the continuous development of human society. That is why we aim at creating novel proteins with superior performances and the assays using them, through the rational design and molecular evolution, as well as chemical biological techniques.



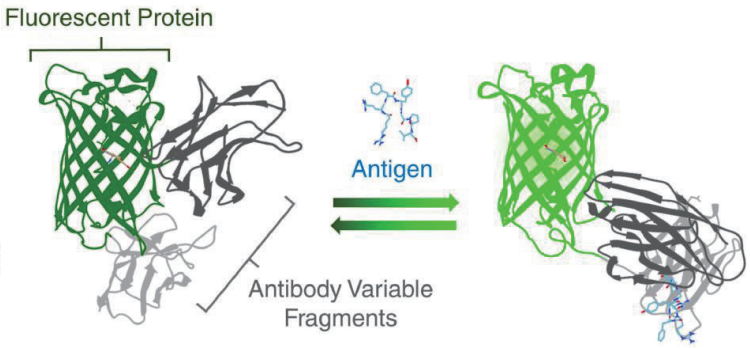
Quenchbody (Q-body)

Fluorescent biosensor based on the antigen-dependent removal of a quenching effect on a fluorophore attached to antibody domains. This sensor is expected to have a range of applications, from in vitro diagnostics, to imaging of various targets *in situ*. (©American Chemical Society)



Open Sandwich Immunoassay

The immunoassay based on the interaction of separated V_L and V_H chains from a single chain antibody variable region. Various small can be measured with a superior detection limit and working range compared with those achieved with the corresponding competitive assays.



Flashbody

The antigen binding causes a change in the environment surrounding the chromophore of fluorescent protein, leading to fluorescence intensity change. Since this sensor is genetically-encoded, it can be used not only for intracellular imaging for specific organelles in living cells but also for *in vivo* imaging in transgenic animals and plants. (©American Chemical Society)