Yanaka Lab

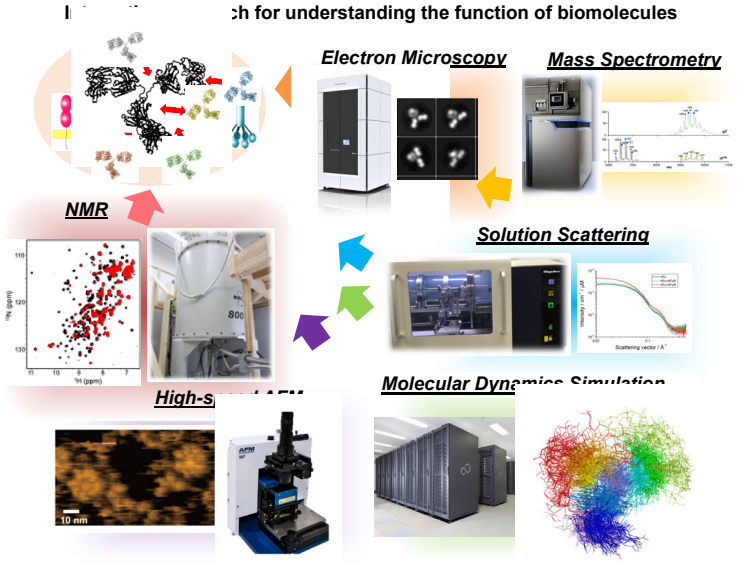
Elucidation and creation of function based on biomolecular science

Labolatory for Materials and Sciences

https://researchmap.jp/yanaka

Areas of research in our laboratory

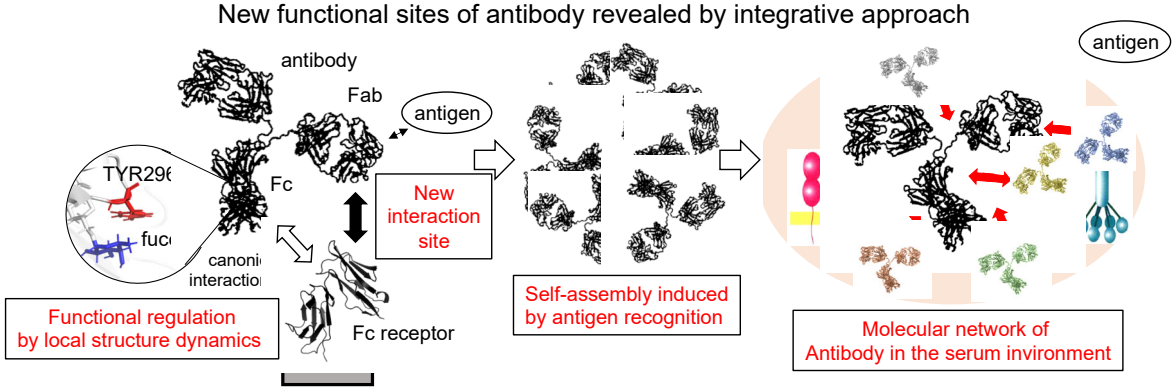
Our bodies are composed of various biopolymers such as nucleic acids, proteins, sugar chains and lipids. These biomolecules perform their own specific functions and work cooperatively to maintain homeostasis in our organisms. Deciphering the operating principles of the functions hidden in biomolecules will advance our understanding of life and disease. Not only that, but biomolecules and their functional modifications can be utilised for pharmaceutical and industrial purposes. **In our laboratory, we combine experimental and theoretical methods to elucidate the functions of biomolecules and create new functions.**



・creation of next-generation antibodies through the exploration and modification of novel interaction sites hidden in molecules.

Antibodies, which play a major role in infection defence in the immune system, activate the immune system through the action of two functional regions: the region that recognises foreign substances and the region that activates the immune system. However, new functional regions have been discovered one after another in recent years in our laboratory, and new molecular mechanisms from antigen recognition to the activation of the immune system have been revealed. **We conduct drug discovery research utilising the newly discovered molecular mechanisms of functional activation.**

New functional sites of antibody revealed by integrative approach



・Developing technologies for biopharmaceutical design by integrating experimental and informatics science.

Antibodies are typical biopharmaceuticals. Information science has become one of the indispensable tools in the design of antibodies as biopharmaceuticals. If there is a large amount of high-quality experimental data on the properties of antibodies, the informatics approach will be able to find rules for antibody design and design useful antibody drugs only in the computer. **In our laboratory, we are acquiring experimental data that contribute to such informatics approach and developing new approaches to biopharmaceutical design.**