Equipment Development Center

YAMAMOTO, Hiroshi	Director
MIZUTANI, Nobuo	Technical Associate
AOYAMA, Masaki	Technical Associate
KONDO, Takuhiko	Technical Associate
TOYODA, Tomonori	Technical Associate
TAKADA, Noriko	Technical Associate
KIMURA, Sachiyo	Technical Associate
KIKUCHI, Takuro	Technical Associate
KIMURA, Kazunori	Technical Associate
MATSUO, Junichi	Technical Associate
SAWADA, Toshihiro	Technical Fellow
YOSHIDA, Hisashi	Technical Fellow
ISHIKAWA, Akiko	Technical Fellow
URANO, Hiroko	Secretary

Research and development of novel instruments demanded in the forefront of molecular science, including their design and fabrication, are the missions of this center. Technical staffs in the two work sections, mechanics and electronics, are engaged in developing state-of-the-art experimental instruments in collaboration with scientists. We expanded our service to other universities and research institutes since 2005, to contribute to the molecular science community and to improve the technology level of the center staffs. A few selected examples of our recent developments are described below.

Production of Detachable Models by 3D Printers

We are providing experimental tools and molecular/cellular models produced by 3D printers that use FDM (Fused Deposition Modeling), stereolithography, or binder jetting methods. The models are tools that are used by researchers to imagine molecular packing, cellular motion, *etc.* by holding them in hand. Since many researchers request to make the models detachable into multiple pieces, we have developed such models by using small magnets. 3D shape data is separated by Boolean processing so that there is no overlap between parts, and the magnets are embedded to allow each parts be reversibly detached.

A leaf primordium model in which each cell can be separated is shown in Figure 1. A Photosystem II protein model in which each subunit can be detached is shown in Figure 2.

Figure 1. Leaf Primordium model.

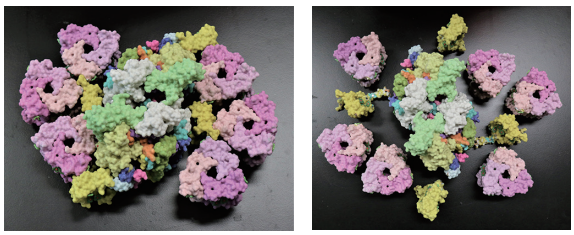

Figure 2. Photosystem II model.

NIM module Power Supply Adaptor

In experiments using a synchrotron light source or a laser, many NIM (Nuclear Instrument Modules) standard modules are used. Powers of NIM modules are supplied from BIN power supply which is expensive and heavy, even when one wishes only to put one or two NIM modules near a detector, for example.

We have developed a cheap and light-weight NIM module Power Supply Adaptor (Figure 3) which can provide power to up to two NIM modules using voltage regulator (Texas Instruments LM2941S/NOPB and LM2991S/NOPB) and AC power adaptors. It connects to NIM modules via cables and can supply maximum 1A at plus and minus 6, 12 and 24V d.c. from assigned connector pins based on the NIM standard. When it detects overcurrent, it protects own circuit and NIM modules by shutting off resettable fuses on circuit board.

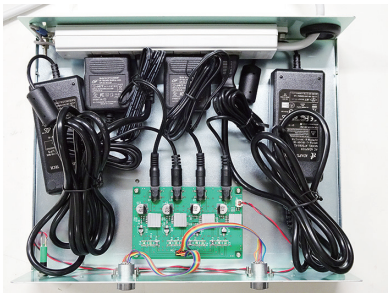

Figure 3. Inside of a NIM module Power Supply Adaptor.

Award

KONDO, Takuhiko; The Chemical Society of Japan Award for Technical Achievements for 2019.