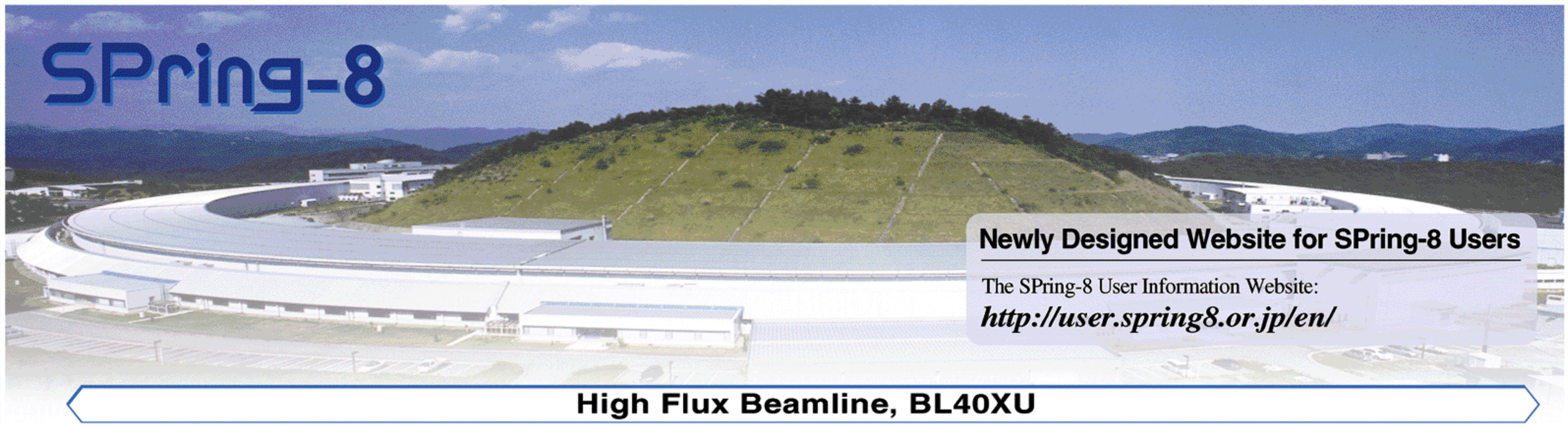
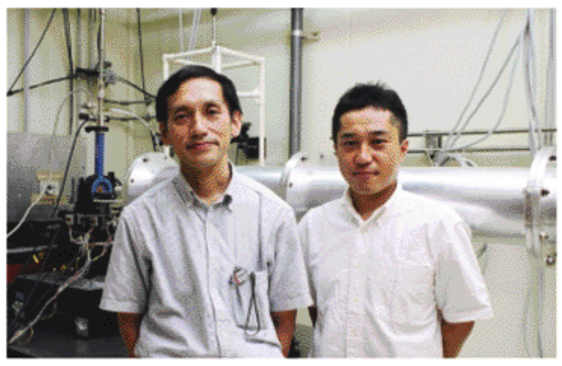


Newly Designed Website for SPring-8 Users

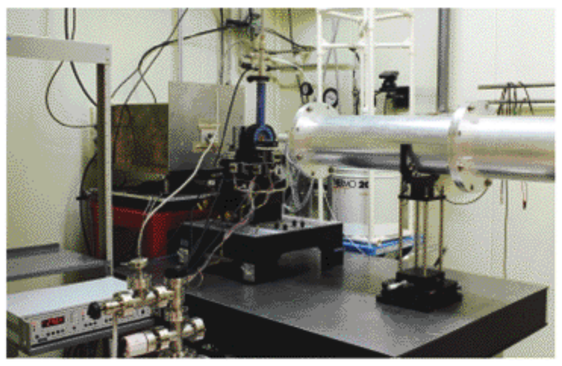
The SPring-8 User Information Website:
http://user.spring8.or.jp/en/

High Flux Beamline, BL40XU

The most important feature of BL40XU is that very high x-ray flux can be used in various experiments. On this concept, the basic design of BL40XU was decided to use the fundamental undulator radiation as a quasi-monochromatic x-ray beam so that the use of the crystal monochromator was eliminated. The flux, when the ring current was 100 mA, was estimated to be 10^{15} photons/sec at 12 keV. The flux density was calculated to be on the order of 10^{17} photons/sec/mm^2.



Dr. Hiroyuki Iwamoto (left) and
Dr. Katsuaki Inoue (Beamline Scientist)



Setup for X-ray cryomicrodiffraction

X-ray diffraction recordings from a single sarcomere within an isolated myofibril

Dr. Hiroyuki Iwamoto (JASRI/SPring-8) and his research team succeeded in recording X-ray diffraction patterns from a single sarcomere within an isolated myofibril of striated muscle, by using the High Flux Beamline, BL40XU, of SPring-8 (Fig. 2).

A striated muscle cell consists of a large number of myofibrils (2-3 μm in diameter), which in turn consist of a large number of sarcomeres (2-3 μm in length) connected in series (Fig. 1). A sarcomere is the minimum functional building block of muscle, and its volume is only ~10 μm^3. X-ray diffraction recording from such a minute, hydrated, unstained biological specimen is unprecedented. In the earlier diffraction recording from a single myofibril by the same research team, the specimen contained ~1,000 sarcomeres. Therefore, this result represents a 1,000-fold gain. This success opens the possibility of *in situ* structural analysis of similarly-sized organelles in the cell.

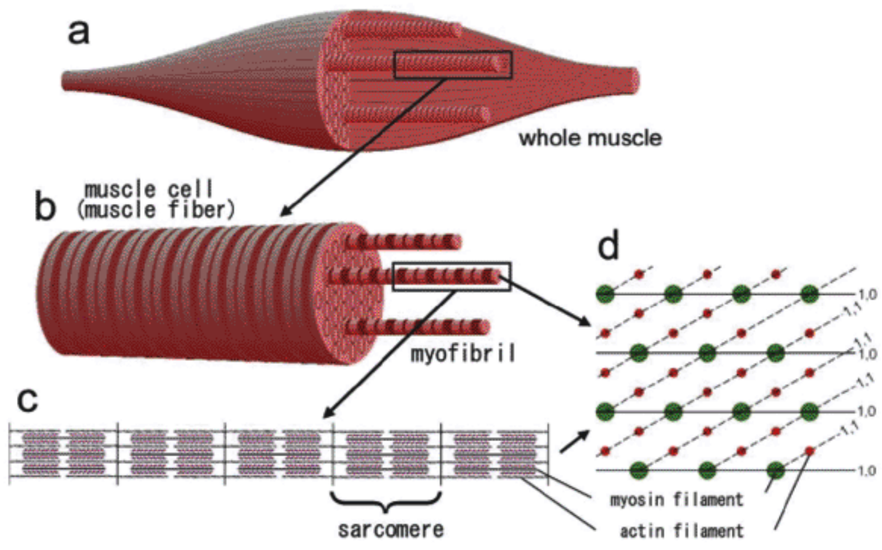


Fig.1 Structure of vertebrate skeletal muscle (striated muscle)

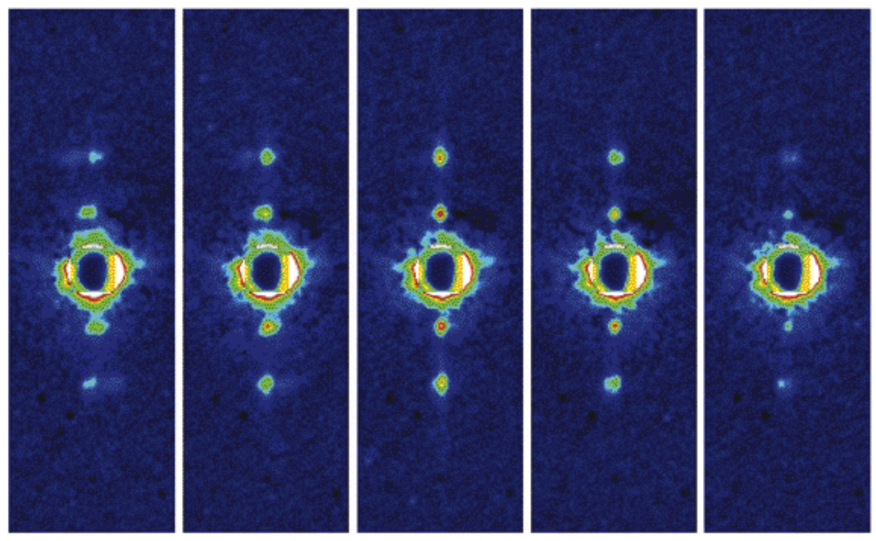


Fig.2 A series of diffraction patterns recorded from a single sarcomere
[Reproduced with IUCr's copyright permission from J. Synchrotron Rad. (2005). 12, 479-483.]

[J. Synchrotron Rad. (2005). 12, 479-483; Iwamoto, H., Inoue, K., Fujisawa, T. and Yagi, N.; "X-ray microdiffraction and conventional diffraction from frozen-hydrated biological specimens"]

SRI 2006

The 9th International Conference on Synchrotron Radiation Instrumentation (SRI 2006), co-hosted by Pohang Accelerator Laboratory (PAL) and JASRI/SPring-8, will be held at the EXCO center, Daegu, Korea, from May 28 to June 3, 2006.

http://sri2006.postech.ac.kr/

SPring-8 **www.spring8.or.jp**