Recent developments of Japanese guidelines for research ethics and their implications for exercise physiology
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Purpose: A general characteristic of Japanese regulations of medical research is the existence of numerous subdivided guidelines and laws. This situation has been prompted by the government's responses to bioethical issues on a case-by-case basis. However, recently the government has seemed to change its policy and gradually made its way toward more comprehensive approach. In this presentation, I focus on the recent revision of the governmental guidelines for medical research involving human subjects and examine the influence of the revision on exercise physiology studies.

Results & Discussion: The ministry of health and the ministry of science and technology jointly set up an advisory committee for revising two major guidelines for medical research in 2012. The committee soon reached a consensus to integrate these two guidelines into one new guideline and expand the scope of the guideline. The new guideline would cover all kinds of medical research involving human subjects. Also, the committee discussed many such ethical issues concerning medical research as informed consent, risk-benefit assessment, and protection of vulnerable populations. In particular, the assessment of risk the assessment of the risk of giving healthy volunteers or athletes exercise stress is critical for exercise physiology and we need to define criteria for the acceptable risk in this field.

Key words: research ethics, ethical guidelines, risk-benefit assessment

The world and the charm of skinned fibers
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As an effector for locomotion, skeletal muscle symbolizes lively activity of animals. Its microscopic striation as well as crystalline alignment of ultramicroscopic myofilaments has also been attracting sincere interest of scientists. Out of their scientific attempts, skeletal muscle fibers are found to retain many of the characteristics and charm of living skeletal muscle even after the removal of cell membrane. Demembranated muscle cell specimens, called skinned fibers, are thus welcomed as sub-cellular ‘living’ specimens for the investigation of life. Skinned fibers sometimes reveals us a part of sophisticated strategy of life in their sarcomere structure. But we are still far from thorough understanding of its designing philosophy.

Taking advantages of the crystalline structure of sarcomere, we have set focus on the indispensable role of myowater in realizing contraction. We have revealed that there are several water states in sarcomere structure, and their distribution reflects functional states of muscle including fatigue. In addition, a minute difference in the structure of myosin isoforms is found to affect crystalline distribution of myosin heads around the thick filament shafts. This head distribution would markedly affect the distribution of water states in the sarcomere, and may account for the differential mechanical performance of fast and slow muscles.

Key words: skeletal muscle, myowater, contraction