

Abstract for WS: “Radiation Diplomacy”, Nov. 3, 2018

Nishina Yoshio as a Biologist: One Origin of Nuclear Biomedical Research in Japan and its Transnational Context

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Recent studies in the history of science pay increasingly more attention to the overlapping areas between nuclear physics and life sciences. Scholars have found much more interactions between these fields of studies on various levels. Disregarding artificial disciplinary boundaries might help historians reveal interactions in Japan, too. Nishina Yoshio (1890-1951) is well-known for the theoretical treatment of the relativistic Compton scattering (the Klein-Nishina formula) and his contribution to construction of cyclotrons at RIKEN. He is therefore best known as a physicist, in particular a nuclear physicist, but that does not mean what he did was limited within physics. Less known is that Nishina and his associates also made serious efforts on biomedical research, especially in fields where new findings and research tools of nuclear physics were relevant, such as biomedical applications of radioisotopes, studies of genetic mutations, and effects of radiation on humans and other organisms. This paper aims to shed a light on one of the origins of nuclear biomedical research in Japan by examining Nishina and his group's scientific activities in this area and to place their research in transnational contexts. First, I will argue that Nishina and his collaborators, including not only members of Nishina's own group, but also of Nishikawa Shōji's group, were seriously engaged in topics of biology and medicine. For Nishina, in particular, studies of biology and medicine constituted an important part of his overall vision of nuclear research, and his accelerator physics and cosmic ray research were conducted in close interactions with biology and medicine. His research in this area occupied much of his attention, to the extent that his younger colleagues in physics complained. Then, I will show that Nishina and others left a considerable impact to later research in this field in Japan. While Nishina's own publications on this topic were not many, his collaborators and students, such as Nakaizumi Masanori, Murati Kōiti, Moriwaki Daigorō, Tajima Eizō, Yamazaki Fumio, and Mori Nobutane, later played important roles in the studies of radiation effects and nuclear medicine. Finally, I will place this early nuclear biological and medical research by Nishina and others in transnational contexts. I will show how their studies resonated with those of overseas scholars, George Hevesy, Niels Bohr, Ernest Lawrence, and Nikolay Timofeev-Ressovsky.