Preface

The National Institute of Radiological Sciences (NIRS) is Japan’s leading medical research institution dedicated to comprehensive research on radiation and human health. Since its initial establishment in 1957, NIRS has carried out various scientific activities related to a wide range of radiological science topics, involving basic and applied science as well as clinical medicine. This annual report summarizes our accomplishments and research outcomes in fiscal year 2014 (April 2014 – March 2015).

NIRS aims to conduct scientific research and development by integrative efforts of a multidisciplinary approach. Based on the knowledge and technologies related to radiation and radiological science, NIRS continues to contribute to society, both in protecting people from radiation injury and in promoting medical use of radiation to overcome health problems. With new opportunities and challenges, NIRS has further advanced and strengthened its collaboration with various organizations and institutions. Scientific outcomes of our research activities have been shared not only with experts of scientific societies but also with the general public and with international organizations, such as the World Health Organization (WHO), International Atomic Energy Agency (IAEA), United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR), and International Commission on Radiological Protection (ICRP).

Efforts to integrate the expertise in various scientific fields are essential for the innovative development in radiological science. Many scientific achievements in NIRS, including cancer therapy with carbon ion beams, molecular imaging in the brain and in malignant tumors, and even basic research on the effects of radiation, are based on the intensive collaboration among the scientists and experts of different fields.

The most striking outcome of these joint efforts at NIRS can be seen by the successful development of cancer radiotherapy with carbon ion beams. This year marked the 20th anniversary of participation by NIRS in carbon ion beam radiotherapy since the first clinical trial was started in 1994. The total number of patients who have participated in clinical studies has reached over nine thousand. Significant improvements have been accomplished during the past two decades in treatment planning, irradiation techniques and treatment in combination with chemotherapy, resulting in excellent treatment outcomes and better prognosis of patients.

Molecular imaging research also requires the joint efforts of multi-disciplinary experts. New molecular imaging probes and new instruments are the key elements for detection of abnormal proteins in the brain of patients with cognitive disorders. Similarly, the development of new molecular probes for tumor imaging has opened a new application of cancer treatment technology known as targeted radionuclide therapy.

NIRS will continue its strong efforts to establish a solid base of comprehensive scientific research in radiological science. I would like to express my sincere appreciation to all the organizations, institutions, collaborators and friends of NIRS for their valuable contributions and support given to the institute.

Yoshiharu Yonekura, M.D., Ph.D.
President