VIII. RESEARCH ACTIVITIES

VIII-I. SUMMARY OF RESEARCH ACTIVITIES

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VIII-I-1. MEETINGS AND SEMINARS

Specialists' Meetings Held in the FY 2010

1. Meeting for Neutron Capture Therapy Using Reactor- and Accelerator-Based Neutron Sources
2. Total Micro-Element Analysis System and Its Application in Kyoto University Reactor
3. Chemistry and Technology of Actimide Elements
4. Abnormal Protein Aggregation and the Folding Diseases, and Their Protection and Repair System
5. Neutron Imaging
6. The Specialist Research Meeting on Condensed Matter Physics Research Using Short-Lived Nuclei and Radiations (III)
7. Progress on Small-Angle Neutron Scattering - Spectrometer and Analysis Suitable for Compact Neutron Source -
8. Proceedings of the 2nd Specialist Research Meeting on MIEZE/N(R)SE Spectroscopy II
9. Development and Application of Useful Radiotracers
10. Effect of Radiation on the Non-human Biota
11. Positron Beam Techniques for Sciences and Engineering
12. Does the Result of Radiation Carcinogenesis Support LNT Hypothesis
13. Radioactive Waste Management
14. Fusion of Radiation Biology and Molecular Biology

Workshops Organized in the FY 2010

1. Development and Application of Accelerator Neutron Source in KURRI III
2. Proceedings of the Specialist Research Meeting on Development and Applications of Devices for Neutrons IV
3. Workshop on Materials Irradiation Effects and Applications

Special Meeting Held in the FY2010

Meeting on the Future Project of the Kyoto University Research Reactor Institute

VIII-I-2. COLLABORATION RESEARCH AND VISITING SCIENTISTS

Visiting Scientists

The number of project researches	12
(The number of allotted research subject)	(96)
The number of general joint researches	74
The total man-days of visiting scientists	2275

VIII-I-3. EXPERIMENTAL RESEARCH

VIII-I-3-1. LIST OF PROJECT RESEARCH

[Project 1]	Fundamental and Developmental Research on Physical and Chemical Characteristics of Actinides
[Project 2]	Project Research on Material Science Using Short-Lived Nuclei and Radiations
[Project 3]	Project Research on the Abnormal Aggregation of Proteins by UV and Gamma ray-irradiation and Study of Repair Mechanism
[Project 4]	Development of Neutron Optical Devices and its Application to New Neutron Spectrometer and Imaging
[Project 5]	Trace Elemental Analysis Using Research Reactor
[Project 6]	Deuterium Exchages in the Biological Macromolecules for a Neutron Analysis
[Project 7]	Analyzing Tumor Microenvironment and Exploiting its Characteristics for Controlling Malignant Solid Tumors

[Project 9] Studies on Radiation Safety Control at Accelerator Facilities

[Project10] Project Research on the New Applicant Development Using the Characteristics of the Particles from the Neutron Capture Reaction

[Project 11] Participation of Aneuploidy on Radiation-induced Cellular Malignant Transformation

[Project 12] Irradiation Effects on Microstructural Evolution in Materials Irradiated by Particles with High Energy

VIII-I-3-2. LIST OF COLLABORATION RESEARCH

1. Slow Neutron Physics and Neutron Scattering

CO1-1 Development of Multilayer Neutron Mirror for Doppler Shifter (22041)

CO1-2 Fosucing SANS Development for KURRI (22046)

CO1-3 Novel Analyzing Method of Amount of Hydrogen in Metal Alloy Utilizing Small-Angle Neutron Scattering (22057)

2. Nuclear Physics and Nuclear Data

CO2-1 Neutron Flux Measurements of Newly Developed Neutron Collimator (22018)

CO2-2 Characterization of a White Neutron Beam from Thermal to 10 keV for Calibration of Neutron Detectors (22034)

CO2-3 Study on the Neutron Capture Cross Sections of Fission Product Nuclei (22035)

CO2-4 Measurement of the Photofission Cross-Section of Pa-231 by the Fission Track Method (22039)

CO2-5 Test Measurement for Investigating Fast Neutron Capture Reaction with a $LaBr_3$ Detector (22065)

CO2-6 Experiments on Reaction Rates in the Accelerator-Driven System (ADS) with14 MeV Neutrons at the Kyoto University Critical Assembly (KUCA) (CA22101)

3. Reactor Physics and Reactor Engineering

CO3-1 Development on In-reactor Observation System Using Cherenkov Light (II) (22054)

CO3-2 Development of Subcriticality Measurement for Accelerator-Driven Reactor (V) (CA22102)

CO3-3 Measurements of Reactivity Worth of Rare-Earth Elements (II) (CA22103)

CO3-4 Development of Measurement Technique of Thermal Neutron Directional Distributions in a Nuclear Reactor Using a Compact Directional Neutron Sensor (CA22104)

CO3-5 Quantification of Neutron and γ Ray Fields for Subcriticality Determination (III) (CA22105)

CO3-6 Accelerator Neutron Dosimetry Using Composite-gas-filled Proportional Counting Tube (CA22106)

4. Material Science and Radiation Effects

CO4-1 Small Angle Neutron Scattering Measurements of Sodium Oleate by KUR-SANS System (22003)

CO4-2 Radiation-Induced Luminescence for Applying to Retrospective Dosimetry (22016)

CO4-3 Absorption Spectroscopy with the Coherent THz Radiation from Linac Electron Beams (22020)

CO4-4 Preliminary Research for Application of Hydrogen Atom Encapsulated in Cage of Silsesquioxanes (22022)

CO4-5 The State Analysis of Gold on Magnetite Using ^{197}Au Mössbauer Spectroscopy (22023)

CO4-6 Coherent Excitation of Superionic Conduction (22024)

CO4-7 Dependence of Spatial Resolution with Wavelength in the Scanning Near-Field THz-wave Microscopy with CTR (22027)

CO4-8 EO Sampling of Coherent Transition Radiation with Optical Cherenkov Radiation (22036)

CO4-9 Complex Structure of Ions Coordinated with Hydrophilic Polymer. 11: (22040)

CO4-10 Kinetics Study on Release Behavior of Tritium Produced in neutron-irradiated Li_2TiO_3 (22053)

CO4-11 Neutron Irradiation Effects of Superconducting Magnet Materials at Low Temperature (22060)

CO4-12 The State Analysis of Gold Catalysis Prepared by a New Method Using ^{197}Au Mössbauer Spectroscopy (22064)

CO4-13 ^{129}I Mössbauer Spectroscopic Study of Hydrated and Dehydrated MMX-type Chain Complexes (22067)

5. Geochemistry and Environmental Science

CO5-1 Thermal History of Metamorphic Rocks with a Dike (22001)

CO5-2 Radiometric Dating for Paleoemvironmental Study of East Asia (22002)

CO5-3 Concentration Changes of Elements on Kosa Event (22021)

CO5-4 Study on Thermal History of Hydrothermally Altered Rocks Based on Fission Track Dating (22029)

CO5-5 Soil Remediation by Photolysis Reaction and Elution with Organic Substances (22031)

CO5-6 Study of Earth and Planetary Matters by Thermoluminescence (22037)

CO5-7 Gamma-Irradiation Effect on Wasted Natural Agricultural Products (Coffee Beans, Indian Corns, and Rice Shells) Toward the Re-Use Purpose (22045)

CO5-8 Cathodoluminescence Study of Nanodiamond Formation in Meteorites (22047)

CO5-9 Determination of Trace Amount of Halogens Using Radiochemical Neutron Activation Analysis (RNAA) (22052)

CO5-10 Root Uptake of Iodine by Orchardgrass in Water Culture (22059)

6. Life Science and Medical Science

CO6-1 Characterization of Clustered DNA Damage Induced by Ionizing Radiation Specifically (22007)

CO6-2 TMZ may not be Incompatible with BPA-based BNCT (22013)

CO6-3 Boron Neutron Capture Therapy with Novel Boron Compounds for Pleural esothelioma (22015)

CO6-4 Development of BNCT for Clear Cell Sarcoma (22025)

CO6-5 Determination of Trace Elements in Pancreata and Testes of Zn-deficient Mice (22042)

CO6-6 A New Reagent for Disulfide-Coupled Protein Folding (22061)

CO6-7 The Preliminary Neutron Experiment for Neutron Biology Using 4CND (22062)

7. Neutron Capture Therapy

CO7-1 Irradiation Characteristics of D_2O Facility in KUR with Low-enriched Uranium Fuel (22004)

CO7-2 Development of New Boron Carriers for Boron Neutron Capture Therapy (BNCT) (22006)

CO7-3 Dodecaborate Lipid Liposomes as New Vehicles for Boron Delivery System of Neutron Capture Therapy (22008)

CO7-4 Hyaluronan-Conjugated Liposomes as Carrier of Sodium Borocaptate for Tumor Targeting in Boron Neutron Capture Therapy (22009)

CO7-5 Enhanced the Effect of Boron Neutron Capture Therapy -Design of Boron-containing Nanoparticles with Highly Tumor-accumulating Character- (22010)

CO7-6 Boron Neutron Capture Therapy for Extramammary Paget's Disease (22011)

CO7-7 Tumour Growth Suppression by Gadorinium Neutron Capture Therapy with Intra-arterial Administration of Gadoteridol-Entrapped Water-in-Oil-in-Water Emulsion as Novel Gadrinium Carrier in VX-2 Rabbit Hepatic Cancer Model (22012)

CO7-8 Serious Radiation Necrosis after BNCT on Grade III Glioma of von Recklinghausen's Disease – Case Report (22014)

CO7-9 Boron Neutron Capture Therapy for Malignant Brain Tumors Using Epithermal Neutron (22017)

CO7-10 Development Teserch on Boron Neutron Capture Therapy for Malignant Brain Tumors (Improvement of a Further Therapeutic Efficacy) (22032)

CO7-11 Tumor Accumulation and Neutron Capture Efficacy of ε-Poly-Lysine Based Polyamines Conjugate with Boron Clusters (22033)

CO7-12 The study of the BNCT Effect Using the Boron Carriers on Oral Squamous Cell Carcinoma Cell (22038)

CO7-13 Boron Neutron Capture Therapy for Malignant Pleural Mesothelioma (22038))

CO7-14 Influence of the Sonoporation to the Boron Neutron Capture Therapy in Oral Squamous Cell Carcinoma (22049)
CO7-15 Clinical Studies on BNCT for 2 Cases of Recurrent Head and Neck Cancer (22050)
CO7-16 Clinical Study of Boron Neutron Capture Therapy for Oral Cancer (22051)

8. Neutron Radiography and Radiation Application

CO8-1 Transmission Electron Images Using ^{204}Tl (22026)
CO8-2 Catalytic Decomposition Characteristics of Satellite Propulsion Thruster Using Neutron Radiography Technology at Kyoto University Research Reactor Institute (KUR) (22068)

9. TRU and Nuclear Chemistry

CO9-1 Adsorptivity of Polyvinylpolypyrrolidone Irradiated by γ-Ray in HNO_3 to Metal Ions (22063)

10. Health Physics and Waste Management

CO10-1 Damage of USB Semiconductor Memory by Radiation Exposure (22043)

12. *Others*

CO12-1 Approach for Structural Analysis of Boundary Lubrication Film by Means of Neutron Reflectometry (22030)
CO12-2 Specification of As in Seaweeds (22044)
CO12-3 Effect of Co-cultured Silicon Particles on Neural Stem Cell (22058)
CO12-4 Mössbauer Spectra Measurements of Synthetic and Natural Magnetites (22066)

VIII-I-3-3. LIST OF ORIGINAL RESEARCH

OR1 Significance of Manipulating Tumor Hypoxia and Radiation Dose Ratein Terms of Local Tumor Response and Lung Metastatic Potential