

## CONTENTS

<b>I. ANNUAL SUMMARY OF EXPERIMENTAL RESEARCH ACTIVITIES</b>		1
<b>I-1. PROJECT RESEARCHES</b>		2
<b>Project 1</b>	Development on Neutron Imaging Application	
	Y. Saito (R4P1)	3
<b>PR1-1</b>	Measurements of multiphase flow dynamics using neutron radiography Y. Saito <i>et al.</i> (R4P1-1)	4
<b>PR1-2</b>	Effect of Water Accumulation in Polymer Electrolyte Fuel Cell and the Cell Performances due to the Difference in the Surface Pressure H. Murakawa <i>et al.</i> (R4P1-2)	5
<b>PR1-3</b>	Influence of Luminance Scatter in Darkbox for Visualization by using Neutron Radiography H. Umekawa <i>et al.</i> (R4P1-3)	6
<b>PR1-4</b>	Effect of the moisture content of high-strength concrete on the spalling phenomenon under fire M. Yoshioka <i>et al.</i> (R4P1-5)	7
<b>PR1-5</b>	Effects of the mixer shape in a flow-type supercritical hydrothermal reactor as evaluated by neutron radiography K. Sato <i>et al.</i> (R4P1-6)	8
<b>PR1-6</b>	Neutron Imaging of Plant Roots in Soil Containing Organic Materials U. Matsushima <i>et al.</i> (R4P1-7)	9
<b>PR1-7</b>	Development of a method for quantitative estimation of neutron imaging M. Kitaguchi <i>et al.</i> (R4P1-8)	10
<b>PR1-8</b>	Observation of Lithium Migration in NASICON-Type Solid Electrolyte by Means of Neutron Radiography S. Takai <i>et al.</i> (R4P1-9)	11
<b>PR1-9</b>	Flow Visualization of Liquid Infiltrating into Complex Structures M. Kaneda <i>et al.</i> (R4P1-10)	12
<b>Project 2</b>	Advancement of integrated system for dose estimation in BNCT	
	Y. Sakurai (R4P2)	14
<b>PR2-1</b>	Establishment of characterization estimation method in BNCT irradiation field using Bonner sphere and ionization chamber (VI) Y. Sakurai <i>et al.</i> (R4P2-1)	15
<b>PR2-2</b>	Study on neutron energy spectrometry for epi-thermal neutrons S. Yoshihashi <i>et al.</i> (R4P2-2)	16
<b>PR2-3</b>	Development of Bonner Sphere Spectrometer using Small Lithium-Glass Scintillator for Intense Neutron Beams A. Masuda <i>et al.</i> (R4P2-3)	17
<b>PR2-4</b>	Improvement of the SOF detector system for energy-dependent discrimination and long-term stability M. Ishikawa <i>et al.</i> (R4P2-4)	18
<b>PR2-5</b>	Improvement of Absolute Fast Neutron Flux Intensity Monitor for BNCT I. Murata <i>et al.</i> (R4P2-5)	19
<b>PR2-6</b>	Neutron Image Sensor for Boron Neutron Capture Therapy M. Taniguchi <i>et al.</i> (R4P2-7)	20
<b>PR2-7</b>	Preliminary survey of nuclide for epithermal neutron measurement using gel detector K. Tanaka <i>et al.</i> (R4P2-8)	21
<b>PR2-8</b>	Development and evaluation of 3D gel dosimeter for the measurement of dose distribution in BNCT S. Hayashi <i>et al.</i> (R4P2-11)	22

<b>PR2-9</b>	Establishment of beam-quality estimation method in BNCT irradiation field using dual phantom technique (VI) Y. Sakurai <i>et al.</i> (R4P2-12) .....	23
<b>PR2-10</b>	Development of real-time boron-concentration estimation method using gamma-ray telescope system for BNCT Y. Sakurai <i>et al.</i> (R4P2-13) .....	24
<b>PR2-11</b>	Development of scintillator for thermal neutron detector in BNCT N. Matsubayashi <i>et al.</i> (R4P2-14) .....	25
<b>PR2-12</b>	Quantitative Measurement of 478 keV Prompt Gamma-rays of Boron-neutron Capture Reaction S. Komura <i>et al.</i> (R4P2-15) .....	26
<b>PR2-13</b>	Visualization of Boron Dose Distribution on a Borosilicate Glass Plate by Neutron Irradiation A. Nohtomi <i>et al.</i> (R4P2-16) .....	27
<b>PR2-14</b>	Investigation of Thermal Neutron-Induced Soft Errors in Semiconductor Devices H. Tanaka <i>et al.</i> (R4P2-18) .....	28
<b>PR2-15</b>	Dosimetric Characteristics of Optimized Bolus for Boron Neutron Capture Therapy T. Takata <i>et al.</i> (R4P2-19) .....	29
<b>PR2-16</b>	Three dimensional humanized oral cancer in vitro model for BNCT K. Igawa <i>et al.</i> (R4P2-23) .....	30
<b>PR2-17</b>	Boron-10 uptake distribution in 3D oral cancer model using CR-39 solid state nuclear track detector K. Igawa <i>et al.</i> (R4P2-24) .....	31
<b>Project 3</b>	Project Research on Advances in Isotope-Specific Studies Using Multi-Element Mössbauer Spectroscopy M. Seto (R4P3) .....	33
<b>PR3-1</b>	Intensity tensor for Fe <sup>2+</sup> at the M1 site of diopside by single crystal Mössbauer spectroscopy K. Shinoda <i>et al.</i> (R4P3-1) .....	34
<b>PR3-2</b>	Electrical conductivity and the iron valence state of silicate glasses up to Mbar pressures I. Mashino <i>et al.</i> (R4P3-3) .....	35
<b>PR3-3</b>	Change in Fe valence state of Fe and Ni substituted Li <sub>2</sub> MnO <sub>3</sub> positive electrode material during different synthetic method by <sup>57</sup> Fe Mössbauer spectroscopy M. Tabuchi and Y. Kobayashi (R4P3-4) .....	36
<b>PR3-4</b>	Research on magnetism and electronic phase in a H-doped iron-based superconductor Y. Kamihara <i>et al.</i> (R4P3-5) .....	37
<b>PR3-5</b>	Experimental Preliminary Approach on the Precipitation Mechanism of Banded Iron Formation (BIF): Part 2. K. Yonezu <i>et al.</i> (R4P3-6) .....	38
<b>PR3-6</b>	<sup>61</sup> Ni Mössbauer Spectroscopy for Hofmann-type Supramolecular Bridging Cyanide Complexes K. KITASE <i>et al.</i> (R4P3-7) .....	39
<b>PR3-7</b>	Chemical species for precursor of supported gold cluster catalysts presumed from Recoil-free fraction in <sup>197</sup> Au Mössbauer spectroscopy H. Ohashi <i>et al.</i> (R4P3-8) .....	40
<b>PR3-8</b>	Recoilless Fraction on <sup>197</sup> Au Mössbauer Spectroscopy (2) Y. Kobayashi and H. Ohashi (R4P3-9) .....	41
<b>PR3-9</b>	EuS property as the energy standard material at <sup>151</sup> Eu Mössbauer spectroscopy R. Masuda <i>et al.</i> (R4P3-10) .....	42
<b>PR3-10</b>	Development of <sup>119</sup> Sn Mössbauer Source S. Kitao <i>et al.</i> (R4P3-11) .....	43

<b>Project 4</b>	Preclinical studies for applying BNCT to veterinary medicine M. Suzuki (R4P4) .....	45
<b>PR4-1</b>	The Basic Study Aimed at Performing the Boron Neutron Capture Therapy for Canine Osteosarcoma R. Iwasaki <i>et al.</i> (R4P4-1) .....	46
<b>PR4-2</b>	Caninization of Anti BSH Antibody Prepared from Rabbit Lymphocytes N. Ueda <i>et al.</i> (R4P4-2) .....	47
<b>PR4-3</b>	Antibody conjugated BNNT/ $\beta$ -1,3-glucan complex as a boron agent for BNCT K. Yamana <i>et al.</i> (R4P4-3) .....	48
<b>PR4-4</b>	Investigation of the relationship between the therapeutic efficacy of boron neutron capture therapy and the persistence of boron in tumors Y. Wada <i>et al.</i> (R4P4-4) .....	49
<b>Project 5</b>	<b>The effect of BNCT on normal tissues</b> M. Suzuki (R4P5) .....	51
<b>PR5-1</b>	Phenotypic Change of Macrophage/Microglia in the Brain after BNCT N. Kondo <i>et al.</i> (R4P5-3) .....	52
<b>PR5-2</b>	The effect of boron neutron capture therapy (BNCT) on esophagus in mice M. Suzuki <i>et al.</i> (R4P5-4) .....	53
<b>PR5-3</b>	The Influence of Boron Neutron Capture Therapy on Bone Growth in Young Mice R. Iwasaki <i>et al.</i> (R4P5-6) .....	54
<b>Project 6</b>	Production of medical RI by reactor irradiation T. Yamamura <i>et al.</i> (R4P6) .....	56
<b>PR6-1</b>	Development of tumor-targeted radiotheranostics probes and its clinical application H. Kimura <i>et al.</i> (R4P6-2) .....	57
<b>PR6-2</b>	Preliminary study on the development of online monitoring system for column separation of $^{177}\text{Lu}$ from $^{nat}\text{Yb}$ irradiated target K. Washiyama <i>et al.</i> (R4P6-4) .....	58
<b>Project 7</b>	Chemical and electronic properties of Actinide compounds and their applications T. Yamamura (R4P7) .....	60
<b>PR7-1</b>	Effect of uranium deficiency in unconventional superconductor $\text{UTe}_2$ Y. Haga <i>et al.</i> (R4P7-1) .....	61
<b>PR7-2</b>	Development of relativistic multireference electron correlation methods for actinide compounds M. Abe <i>et al.</i> (R4P7-2) .....	62
<b>PR7-3</b>	Synthesis of novel phthalocyanine derivatives and effect of substituent on recognition of light actinide and chemical property-4 M. Nakase <i>et al.</i> (R4P7-3) .....	63
<b>PR7-4</b>	Fundamental preparation study to access functional uranium(III) complexes K. Shirasaki <i>et al.</i> (R4P7-4) .....	64
<b>PR7-5</b>	Synthesis of ultra-pure $\text{UTe}_2$ by molten salt flux method S. Kambe <i>et al.</i> (R4P7-5) .....	65
<b>PR7-6</b>	Exploration of new interactions between actinide 5f electron systems and photo-excited organic $\pi$ -electron systems N. Ishikawa (R4P7-6) .....	66
<b>PR7-7</b>	Fundamental Study on Extraction/Separation of Actinides and Their Decay Products for Medical Nuclide Production – Dissolution Methods of $\text{ThO}_2$ by Thermochemical Conversion – T. Suzuki <i>et al.</i> (R4P7-7) .....	67

<b>PR7-8</b>	Potential Another Factor to Give Selective Complex Formation between Monoamide Compounds and Actinyl Ions M. Nogami and T. Yamamura (R4P7-8).....	68
<b>Project 8</b>	Fundamental Research on Decommissioning of Reactor Facility J. Hori (R4P8) .....	70
<b>PR8-1</b>	Neutron Flux Measurement for Activation Modeling of KUR facility T. Sano <i>et al.</i> (R4P8-1) .....	71
<b>PR8-2</b>	Fundamental Research about Radioactive Contamination Survey on Nuclear Reactor Facility S. Fukutani <i>et al.</i> (R4P8-3) .....	72
<b>PR8-3</b>	Neutron Capture Cross-Section Measurements with TC-Pn in KUR for Some Nuclides targeted for Decommissioning S. Nakamura <i>et al.</i> (R4P8-4).....	73
<b>PR8-4</b>	Identification of Nuclear Material in Spent Fuel Y. Nauchi <i>et al.</i> (R4P8-5) .....	74
<b>PR8-5</b>	External Neutron Source for Non-Destructive Analysis of Fuel Debris Y. Nauchi <i>et al.</i> (R4P8-6) .....	75
<b>PR8-6</b>	Study of Non-destructive Analysis Method for Fuel Debris using Neutron Resonance Absorption J. Hori <i>et al.</i> (R4P8-7) .....	76
<b>I-2. COLLABORATION RESEARCHES</b>	.....	77
<b>1. Slow Neutron Physics and Neutron Scattering</b>		
<b>CO1-1</b>	Improvement of multilayer mirrors for neutron interferometer M. Kitaguchi <i>et al.</i> (R4020) .....	78
<b>CO1-2</b>	Development of a Spin Analyzer for Ultra-Cold Neutron S. Kawasaki <i>et al.</i> (R4099) .....	79
<b>CO1-3</b>	Development of High-resolution Cold/Ultracold Neutron Detectors Using Nuclear Emulsion N. Naganawa <i>et al.</i> (R4137) .....	80
<b>CO1-4</b>	Towards to ultra small <i>d</i> -spacing neutron monochromator M. Hino <i>et al.</i> (R4138) .....	81
<b>2. Nuclear Physics and Nuclear Data</b>		
<b>CO2-1</b>	$\beta$ -decay spectroscopy of rare fission products with a $4\pi$ clover detector using an Isotope Separator On-Line KUR-ISOL S. Sakakibara <i>et al.</i> (R4087) .....	82
<b>CO2-2</b>	Development and test of a current-mode $^3\text{He}$ gas neutron detectors for an intense neutron beam T. Matsumoto <i>et al.</i> (R4125) .....	83
<b>CO2-3</b>	Development of neutron resonance analysis technique using a neutron time-of-flight method J. Lee <i>et al.</i> (R4141) .....	84
<b>CO2-4</b>	Technique of Transferring Radioactive Atomic Nuclei Implanted in Dry Ice Film A. Taniguchi <i>et al.</i> (R4153) .....	85
<b>CO2-5</b>	Validation Experiment of Thermal Neutron Scattering Law Data for Innovative Reactor J. Hori <i>et al.</i> (R4158) .....	86
<b>CO2-6</b>	Measurement of C-13 neutron cross-section for new nuclear battery T. Wallace-Smith <i>et al.</i> (R4164) .....	87
<b>CO2-7</b>	Measurement of Energy Resokution in the KURNS-LINAC Pulsed Neutron Facility[3] T. Sano <i>et al.</i> (R4175) .....	88
<b>CO2-8</b>	Search for Tetraneutron Bound State Emitted with Uranium Fission H. Fujioka <i>et al.</i> (R4189) .....	89

### 3. Reactor Physics and Reactor Engineering

CO3-1	Basic Research for Sophistication of High-power Reactor Noise Analysis (V) S. Hohara <i>et al.</i> (R4066) .....	90
CO3-2	Reactor Keinetics Experiment in KUR T. Sano <i>et al.</i> (R4185) .....	91

### 4. Material Science and Radiation Effects

CO4-1	Study on HPLC Elution Behavior of Heavy Lanthanide Metalloufullerenes K. Akiyama <i>et al.</i> (R4006) .....	92
CO4-2	Radiation Tolerance of SiC p+n Junction-Diodes for High-Energy Physics Experiments T. Kishishita <i>et al.</i> (R4008) .....	93
CO4-3	Positron Annihilation Spectroscopy in Neutron-irradiated Fe-Cr Alloys K. Sato <i>et al.</i> (R4009) .....	94
CO4-4	The change of free volume in highly-hydrogenated DLC film due to thermal desorption K. Kanda <i>et al.</i> (R4014) .....	95
CO4-5	Effect of gamma radiation on ultra-micro structure of hardwood cell-wall K. Murata <i>et al.</i> (R4021) .....	96
CO4-6	Investigation of Concentration Dependence on Local Structures at Cd Sites in $Cd_xSr_{1-x}TiO_3$ S. Komatsuda <i>et al.</i> (R4053) .....	97
CO4-7	Hydrogen trapping behavior at vacancy in Fe-Al alloy with electron irradiation F. Hori <i>et al.</i> (R4061) .....	98
CO4-8	Metal nano-composites formation in water solution by electron irradiation reduction F. Hori <i>et al.</i> (R4062) .....	99
CO4-9	Slow Positron Beam Analysis of Polymer Composite Materials Z. Chen <i>et al.</i> (R4067) .....	100
CO4-10	Characterization of Precipitates in Cu alloy using Small-Angle X-ray Scattering Y. Oba and H. Sasaki (R4069) .....	101
CO4-11	Gamma-ray induced photo emission from GaP single crystal wafer: Comparison with GaN T. Nakamura <i>et al.</i> (R4078) .....	102
CO4-12	Porosity control of diamond-like carbon films S. Nakao <i>et al.</i> (R4080) .....	103
CO4-13	Hyperfine Fields in $La_{0.7}Ca_{0.3}Mn_{0.45}Fe_{0.55}O_3$ Measured by Means of Mössbauer and TDPAC Spectroscopies W. Sato <i>et al.</i> (R4082) .....	104
CO4-14	A study of guar-gum hydrogels using small angle X-ray scattering T. Tominaga <i>et al.</i> (R4088) .....	105
CO4-15	Tritium recovery behavior for tritium breeder $Li_2TiO_3$ - $Li_4SiO_4$ biphasic materials with various phase ratios and Pb addition Y. Oya <i>et al.</i> (R4096) .....	106
CO4-16	Study to improve transport and measurement performance of a slow positron beamline A. Kinomura <i>et al.</i> (R4100) .....	107
CO4-17	Complex Structure of Ions Coordinated with Hydrophilic Polymer 23. Iodine Doping with Organic Tissues. A. Kawaguchi and Y. Morimoto (R4101) .....	108
CO4-18	Chemical form of tritium released from neutron-irradiated FLiNaK mixed with Ti powder K. Katayama <i>et al.</i> (R4102) .....	109
CO4-19	Study on $^{99m}Tc$ separation/concentration technology from $^{99}Mo$ by (n, $\gamma$ ) method Y. Fujita <i>et al.</i> (R4112) .....	110

<b>CO4-20</b>	Observation of Low Fluence Irradiated Accident Tolerant Control Rod Material H. Ohta <i>et al.</i> (R4116).....	111
<b>CO4-21</b>	Evaluation of Irradiation Damage on Semiconductor Surfaces during Plasma Etching using the Positron Annihilation Method J. Yanagisawa <i>et al.</i> (R4117) .....	112
<b>CO4-22</b>	Correlation between irradiation defect density and hydrogen isotope retention in tungsten M.I. Kobayashi <i>et al.</i> (R4127) .....	113
<b>CO4-23</b>	Characteristics of Improved Tetrode Configuration for Radiation Tolerant Image Sensor Y. Gotoh <i>et al.</i> (R4144) .....	114
<b>CO4-24</b>	Characterization of YBa <sub>2</sub> Cu <sub>3</sub> O <sub>y</sub> and FeSe <sub>0.5</sub> Te <sub>0.5</sub> superconducting films using a slow positron beam T. Ozaki <i>et al.</i> (R4145).....	115
<b>CO4-25</b>	Neutron irradiation tests for components of ITER plasma diagnostics M. Ishikawa <i>et al.</i> (R4146) .....	116
<b>CO4-26</b>	Study of resonant frequency change with irradiation dose of piezoelectric PZT element M. Kobayashi <i>et al.</i> (R4147) .....	117
<b>CO4-27</b>	Radiation Induced Demagnetization of Neodymium Magnets Y. Fuwa <i>et al.</i> (R4165) .....	118
<b>CO4-28</b>	Fundamental study of damage on tungsten by heat and particle loading K. Tokunaga <i>et al.</i> (R4169).....	119
<b>CO4-29</b>	Vacancy Migration Energy in CrFeNi Medium-Entropy Alloy H. Araki <i>et al.</i> (R4170).....	120
<b>CO4-30</b>	A study on destruction of cesium aluminosilicate compounds by gamma irradiation (4) H. Ohashi <i>et al.</i> (R4173) .....	121
<b>CO4-31</b>	Radiotolerance analysis of <i>Deinococcus sp.</i> strain AKn-1 isolated from the coast of Akina bay in Amami-Oshima Island H. Ohashi <i>et al.</i> (R4174) .....	122
<b>CO4-32</b>	TDPAC Measurement of <sup>111</sup> Cd( $\leftarrow$ <sup>111</sup> In) in Ultrafine Bubble Water M. Tanigaki <i>et al.</i> (R4184).....	123
<b>CO4-33</b>	Low Energy Positron Annihilation Lifetime Spectroscopy of Chromium Oxynitride Epitaxial Films on Magnesium oxide crystalline substrates M. Kitaura <i>et al.</i> (R4187) .....	124
<b>CO4-34</b>	Influence of Hydrogen Isotopes on Growth of Vacancy Clusters in Tungsten-Based Materials Y. Hatano <i>et al.</i> (R4188) .....	125
<b>CO4-35</b>	Magnetic Measurements of Irons in Soda-lime Glass by Mössbauer Spectroscopy K. Okada and Y. Kobayashi (R4192).....	126
<b>CO4-36</b>	Gamma-ray energy separation by shielding material for 1F debris distribution estimation Y. Okuno and N. Sato (R4194).....	127
<b>CO4-37</b>	Study on activation of neutron optical elements in a new research reactor H. Fujioka <i>et al.</i> (R4195) .....	128

## 5. Geochemistry and Environmental Science

<b>CO5-1</b>	Track observation in muscovite irradiated by <sup>241</sup> Am sources and its thermal stability N. Hasebe <i>et al.</i> (R4001) .....	129
<b>CO5-2</b>	Mechanisms of high-pressure transitions in (Mg,Fe) <sub>2</sub> SiO <sub>4</sub> under differential stress N. Tomioka <i>et al.</i> (R4007) .....	130
<b>CO5-3</b>	Experimental evaluation of impact-induced structure transformation of planetary minerals T. Okuchi <i>et al.</i> (R4011) .....	131

<b>CO5-4</b>	Volcanic and Tectonic History of Philippine Sea Plate (South of Japan) Revealed by $^{40}\text{Ar}/^{39}\text{Ar}$ Dating Technique O. Ishizuka <i>et al.</i> (R4013) .....	132
<b>CO5-5</b>	Temporal trends of extractable organochlorine in wild kite ( <i>Milvus migrans</i> ) K. Ito <i>et al.</i> (R4035) .....	133
<b>CO5-6</b>	Determination of Uranium in Local Fallout from A-bomb Using Fission-Track Analysis K. Takamiya <i>et al.</i> (R4042) .....	134
<b>CO5-7</b>	Trace elements and Ar-Ar analyses of extraterrestrial materials R. Okazaki <i>et al.</i> (R4045) .....	135
<b>CO5-8</b>	$^{40}\text{Ar}$ - $^{39}\text{Ar}$ Dating of Extraterrestrial Materials in KURNS N. Iwata <i>et al.</i> (R4068) .....	136
<b>CO5-9</b>	Determination of Abundance of Rare Metal Elements in Seafloor Hydrothermal Ore Deposits by INAA Techniques-9: Behaviour of trace metal elements in gold-rich hydrothermal ore deposits J. Ishibashi <i>et al.</i> (R4077) .....	137
<b>CO5-10</b>	Size distribution of metal elements in the atmospheric aerosols N. Ito <i>et al.</i> (R4089) .....	138
<b>CO5-11</b>	Absorption of alkali metal ions by white radish sprouts (IV) M. Yanaga <i>et al.</i> (R4090) .....	139
<b>CO5-12</b>	Basic Study on Trace Elemental Analysis of Airborne Particulate Matters in an Environment by INAA & PIXE N. Hagura <i>et al.</i> (R4118) .....	140
<b>CO5-13</b>	Ar-Ar Dating for Differentiated Meteorites Y. N. Miura <i>et al.</i> (R4128) .....	141
<b>CO5-14</b>	Halogen and noble gas characteristics of subcontinental lithospheric mantle beneath southwestern North America and northwestern Africa H. Sumino <i>et al.</i> (R4152) .....	142
<b>CO5-15</b>	Determination of Cl, Br and I contents in U. S. Geological Survey reference materials by RNAA S. Shirai <i>et al.</i> (R4166) .....	143
<b>CO5-16</b>	Phase identification and amorphous structure analysis of chondrule-simulated samples Y. Seto <i>et al.</i> (R4186) .....	144
<b>CO5-17</b>	Distribution of radiocesium in forestry area in Fukushima -focusing on inner bark- T. Ohta <i>et al.</i> (R4191) .....	145

## 6. Life Science and Medical Science

<b>CO6-1</b>	Radioresistance Mechanisms Acquired by Adaptive Evolution and their Evolutionary Mechanisms III T. Saito (R4004) .....	146
<b>CO6-2</b>	Integrated approach for structural analysis of a biomacromolecule in a polydispersed solution using analytical ultracentrifugation and small-angle X-ray scattering K. Morishima <i>et al.</i> (R4010) .....	147
<b>CO6-3</b>	Mutational and environmental effects on the dynamic conformational distributions of Lys48- linked di-ubiquitin chains K. Kato <i>et al.</i> (R4012) .....	148
<b>CO6-4</b>	Evaluation of BPA-Uridine conjugates as Smart Drugs for BNCT K. Tanabe <i>et al.</i> (R4022) .....	149
<b>CO6-5</b>	BPA derivative bearing Hoechst unit for BNCT K. Tanabe <i>et al.</i> (R4025) .....	150
<b>CO6-6</b>	Elucidating the Molecular Basis for the Increased Risk of Nuclear Cataract Development with Global Warming N. Yamamoto and T. Takata (R4039) .....	151

<b>C06-7</b>	Elucidation of the effects of dose rate of radiation on normal and tumor tissues T. Watanabe <i>et al.</i> (R4041) .....	152
<b>C06-8</b>	Asp racemization/isomerization in shedding products of cell adhesion molecule 1 is potentially involved in the neurodegeneration induced by elevated pressure A. Yoneshige <i>et al.</i> (R4049) .....	153
<b>C06-9</b>	SAXS analysis for elucidating the inhibitory mechanism of the amyloid precursor of insulin B-chain through the interaction with $\alpha$ B-crystallin Y. Kokuo <i>et al.</i> (R4057) .....	154
<b>C06-10</b>	Detection of the LIM Kinase 1 and Fam81a multimeric complex T. Saneyoshi <i>et al.</i> (R4058) .....	155
<b>C06-11</b>	Structural Analysis of Ceramide Transport Protein (CERT) S. Morita <i>et al.</i> (R4063) .....	156
<b>C06-12</b>	Small-angle X-ray Scattering toward Understanding Chromosomal Modulation by Topoisomerases M. Shimizu <i>et al.</i> (R4072) .....	157
<b>C06-13</b>	Character of DNA damage induced by nuclear plant neutron beams H. Terato <i>et al.</i> (R4073) .....	158
<b>C06-14</b>	Distribution analysis of the chemical modification of the amino acid residues in mice lens structural proteins during age-related cataract S. Matsushita <i>et al.</i> (R4074) .....	159
<b>C06-15</b>	Neutron activation of medicines for development of new imaging methodology A. Toyoshima <i>et al.</i> (R4076) .....	160
<b>C06-16</b>	Polyglycerol Functionalized $^{10}\text{B}$ Enriched Boron Carbide Nanoparticle as an Effective Bimodal Anticancer Nanosensitizer for Boron Neutron Capture and Photothermal Therapies Y. Wang <i>et al.</i> (R4079) .....	161
<b>C06-17</b>	Solution structure of intrinsically disordered protein R. Inoue <i>et al.</i> (R4081) .....	162
<b>C06-18</b>	Oligomeric structure and interaction sites of Dpdc involved in actin bundle network formation H. Koeda <i>et al.</i> (R4083) .....	163
<b>C06-19</b>	Analysis of dynamic structure of intrinsically disordered protein T. Oda <i>et al.</i> (R4084) .....	164
<b>C06-20</b>	Interaction between Mint3 and FIH-1 involved in hypoxia stress responses R. Maeda <i>et al.</i> (R4105) .....	165
<b>C06-21</b>	Analysis of novel p53-DBD aggregate for the development of anti-cancer drug E. Hibino <i>et al.</i> (R4109) .....	166
<b>C06-22</b>	Analysis of the GATA3-nucleosome complex in solution H. Tanaka <i>et al.</i> (R4110) .....	167
<b>C06-23</b>	Measurement of the resistance of the spores of <i>Bacillus subtilis natto</i> to gamma radiation T. Chatake <i>et al.</i> (R4113) .....	168
<b>C06-24</b>	Analysis of water-soluble vitamin K complex from <i>Bacillus subtilis natto</i> T. Chatake <i>et al.</i> (R4114) .....	169
<b>C06-25</b>	Preliminary Study for The Development of New Treatment Method for Myxofibrosarcoma with BNCT T. Fujimoto <i>et al.</i> (R4119) .....	170
<b>C06-26</b>	Development of Boron Cluster-Loaded Nanoparticles for BNCT A. B. Fithroni <i>et al.</i> (R4123) .....	171
<b>C06-27</b>	<i>C9orf72</i> -derived PR poly-dipeptides bind Kap $\beta$ 2: discovery of secondary binding sites E. Mori <i>et al.</i> (R4129) .....	172
<b>C06-28</b>	$^{11}\text{C}$ Medical-isotope Production via $^{12}\text{C}(\gamma, n)^{11}\text{C}$ Reaction with Carbon Nanotubes N. Takahashi <i>et al.</i> (R4130) .....	173

<b>CO6-29</b>	Molecular dynamics analysis of oxidative folding enzyme ER-60 with solution scattering measurement A. Okuda <i>et al.</i> (R4140) .....	174
<b>CO6-30</b>	The regulation of the Kai proteins interaction by the KaiC hexamers that can adopt various kinds of phosphorylation states Y. Yunoki <i>et al.</i> (R4143) .....	175
<b>CO6-31</b>	Small-angle scattering analysis of wheat protein glutenin N. Sato (R4154).....	176
<b>CO6-32</b>	Design, Synthesis, and BNCT Effect of Macrocyclic Polyamine-type Boron Carriers for BNCT S. Aoki <i>et al.</i> (R4180) .....	177
<b>CO6-33</b>	Radiolabeling of composite natural material chicken eggshell membrane via neutron irradiation ${}^6\text{Li}(n,\alpha){}^3\text{H}$ reaction M. Shimizu <i>et al.</i> (R4193).....	178

## 7. Neutron Capture Therapy

<b>CO7-1</b>	Development of Albumin Binding Gadolinium Complexes for MRI-Guided BNCT S. Okada <i>et al.</i> (R4017) .....	179
<b>CO7-2</b>	Iodophenyl-Conjugated <i>closo</i> -Dodecaborate as a Promising Small Boron Agent for BNCT K. Nishimura <i>et al.</i> (R4026) .....	180
<b>CO7-3</b>	Effects of overexpression of <i>LAT1</i> in cancer stem cell-like cells on suppression of tumor growth by boron neutron capture therapy K. Ohnishi <i>et al.</i> (R4027) .....	181
<b>CO7-4</b>	Optimization study of polymer-BPA conjugates for non-clinical study T. Nomoto <i>et al.</i> (R4030) .....	182
<b>CO7-5</b>	Neutron capture therapy using Gd-chelated polymeric drug delivery systems Y. Miura <i>et al.</i> (R4031) .....	183
<b>CO7-6</b>	Lipid-coated boronic oxide nanoparticles as a boron agent for BNCT R. Kawasaki <i>et al.</i> (R4032) .....	184
<b>CO7-7</b>	Combination Effect of Shikonin on BPA-BNCT toward SCCVII Cells-Bearing C3H Mice K. Bando <i>et al.</i> (R4033) .....	185
<b>CO7-8</b>	The Response of Tumor Cells to BNCT Y. Tong <i>et al.</i> (R4036) .....	186
<b>CO7-9</b>	Elucidating the effects of boron neutron capture therapy on host immunity in mice tumor models T. Watanabe <i>et al.</i> (R4040) .....	187
<b>CO7-10</b>	Development of carborane-containing amino acid derivatives for BNCT A. Niitsu <i>et al.</i> (R4043) .....	188
<b>CO7-11</b>	Development of Nano Carriers Installed with Gd(III)-Thiacalixarene Complex for Gd-NCT N. Iki <i>et al.</i> (R4044) .....	189
<b>CO7-12</b>	International Screening study of Boron / Gadolinium Compounds for NCT of malignant tumors, 2022 RR. Zairov <i>et al.</i> (R4047) .....	190
<b>CO7-13</b>	Fluorescent Dodecaborate to Development of Theranostic Type Boron Carrier Y. Hattori <i>et al.</i> (R4051) .....	191
<b>CO7-14</b>	Evaluation of gadolinium biodistribution and tumor-killing effects of surface-modified gadolinium-loaded chitosan nanoparticles for gadolinium neutron capture therapy T. Andoh <i>et al.</i> (R4055) .....	192
<b>CO7-15</b>	Basic research to expand the indication of boron neutron capture therapy to non-neoplastic diseases T. Watanabe <i>et al.</i> (R4056) .....	193
<b>CO7-16</b>	In Vivo Efficacy of BPA-Ionic Liquid as a Novel Compound for BNCT (2) M. Shirakawa <i>et al.</i> (R4059) .....	194

<b>CO7-17</b>	Synthesis of a Novel Boron Compound with Potential Peptide-Related Nuclear Import (2) M. Shirakawa <i>et al.</i> (R4060) .....	195
<b>CO7-18</b>	Construction of novel Boron-containing silica nanoparticles and BNCT experiments F. Tamanoi <i>et al.</i> (R4092) .....	196
<b>CO7-19</b>	Development of Gadolinium-loaded mesoporous silica-based nanoparticles and application to cancer radiotherapy F. Tamanoi <i>et al.</i> (R4093) .....	197
<b>CO7-20</b>	Is the boron neutron capture reaction captured using CR-39 related to boron concentration and cell viability? K. Nakai <i>et al.</i> (R4095) .....	198
<b>CO7-21</b>	L-Phenylalanine Deficiency in Human Tumor Cells Improves BNCT Therapeutic Efficiency Y. Tamari <i>et al.</i> (R4097) .....	199
<b>CO7-22</b>	Mechanism of Glioma Resistance After BNCT Conferred by Glioma Niche N. Kondo <i>et al.</i> (R4103) .....	200
<b>CO7-23</b>	Antitumor effect of boron neutron capture therapy in vulvar cancer mouse model. S. Terada <i>et al.</i> (R4106) .....	201
<b>CO7-24</b>	Anti-tumor effect of boron neutron capture therapy in pelvic human colorectal cancer in a mouse model J. Arima <i>et al.</i> (R4111) .....	202
<b>CO7-25</b>	Research and Development of New Technology for Boron Neutron Capture Therapy M. Xu <i>et al.</i> (R4131) .....	203
<b>CO7-26</b>	Observation of Intracellular Boron Neutron Capture Reaction with a Novel Boron Compound R. Nozaki <i>et al.</i> (R4132) .....	204
<b>CO7-27</b>	Observation of Tumor Tissue Destruction with Boron Neutron Capture Reaction R. Nozaki <i>et al.</i> (R4133) .....	205
<b>CO7-28</b>	Study on Intracellular Protein Destruction by Boron Neutron Capture Reaction Y. Takamura <i>et al.</i> (R4134) .....	206
<b>CO7-29</b>	Attempts to sensitize tumor cells by exploiting the tumor microenvironment Y. Sanada <i>et al.</i> (R4139) .....	207
<b>CO7-30</b>	Enhancement of Tumour Growth Suppression by Bubble Liposome / Ultrasound Stimulation on Intravenous Injection of <sup>10</sup> BSH entrapped PEG Liposome for Boron-Neutron Capture Therapy to Pancreatic Cancer Model <i>in vivo</i> H. Yanagie <i>et al.</i> (R4149) .....	208
<b>CO7-31</b>	The basic research of boron neutron capture therapy for spinal cord gliomas in rat spinal cord glioma models K. Tsujino <i>et al.</i> (R4150) .....	209
<b>CO7-32</b>	Boron neutron capture therapy using folate receptor targeted novel boron carrier for F98 rat brain tumor models K. Tsujino <i>et al.</i> (R4151) .....	210
<b>CO7-33</b>	Development of a Nanomaterial-based Boron Delivery System for BNCT G. Choi <i>et al.</i> (R4160) .....	211
<b>CO7-34</b>	Gadolinium-containing nanoparticles grafted with polyglycerol for magnetic resonance imaging and gadolinium neutron capture therapy of cancer L. Zhao <i>et al.</i> (R4161) .....	212
<b>CO7-35</b>	Development of theranostic agents for boron neutron capture therapy and its companion diagnostics K. Ogawa <i>et al.</i> (R4162) .....	213
<b>CO7-36</b>	Development of Novel Small-molecule Boron Neutron Capture Therapy Drugs Targeting Tumor-specific Enzymatic Activity J. Tsunetomi <i>et al.</i> (R4167) .....	214
<b>CO7-37</b>	Quantitative Evaluation Method of Elemental Contents Related to Activation in Radiation Shielding Concrete T. Takata <i>et al.</i> (R4168) .....	215

<b>CO7-38</b>	Synthesis and evaluation of a novel boron neutron capture therapy agent H. Kimura and M. Suzuki (R4177) .....	216
<b>CO7-39</b>	Investigating Gd-EDTMP as a Neutron Capture Therapy Agent for Mammary Tumor Bone Metastasis in Mouse Models T. Matsukawa <i>et al.</i> (R4178) .....	217
<b>CO7-40</b>	Tumour Growth Suppression by Intra-Tumoural Injection of Gadolinium-Polyplex with Bubble Liposome / Ultrasound Stimulation for Gadolinium-Neutron Capture Therapy to Pancreatic Cancer Model <i>inVivo</i> H. Yanagie <i>et al.</i> (R4179) .....	218
<b>CO7-41</b>	Basic research on new BNCT strategies for melanoma H. Michiue <i>et al.</i> (R4181) .....	219
<b>CO7-42</b>	New boron drug development research targeting pancreatic cancer H. Michiue <i>et al.</i> (R4182) .....	220
<b>CO7-43</b>	Boron-compound diagnostics in the plant using a neutron capture reaction T. Kinouchi (R4183) .....	221
 <b>8. Neutron Radiography and Radiation Application</b>		
<b>CO8-1</b>	Demonstration experiment of detecting the HEU sample using a low-cost inspection system M. Komeda <i>et al.</i> (R4CA01) .....	222
<b>CO8-2</b>	Establishment of a novel mutation breeding using Boron Neutron Capture Reaction (BNCR) M. Kirihata <i>et al.</i> (R4052) .....	223
 <b>9. TRU and Nuclear Chemistry</b>		
<b>CO9-1</b>	Extraction chromatography and solvent extraction of Eu using TEHDGA K. Otsu <i>et al.</i> (R4015) .....	224
<b>CO9-2</b>	Electrochemical Behavior of U in NaCl-CaCl <sub>2</sub> Melt at 823 K T. Murakami <i>et al.</i> (R4048) .....	225
<b>CO9-3</b>	Solid phase analysis of (Zr,Ce)O <sub>2</sub> solid solutions in aqueous systems T. Kobayashi <i>et al.</i> (R4065) .....	226
<b>CO9-4</b>	Solid-liquid extraction and precipitation experiments of <sup>47</sup> Ca for the chemical study of nobelium Y. Kasamatsu <i>et al.</i> (R4126) .....	227
<b>CO9-5</b>	Stability of Cyclic Monoamide Extractants for U(VI) with Longer Side Chains against $\gamma$ -Ray Irradiation in HNO <sub>3</sub> H. Kita <i>et al.</i> (R4157) .....	228
 <b>10. Health Physics and Waste Management</b>		
<b>CO10-1</b>	Application of KURAMA-II to Radiation Monitoring of Soil Separation Facilities in Fukushima Prefecture A. Maekawa <i>et al.</i> (R4016) .....	229
<b>CO10-2</b>	Effective Measures on Safety, Security, Hygiene and Disaster Prevention in Laboratories T. Iimoto <i>et al.</i> (R4085) .....	230
<b>CO10-3</b>	Study of Penetration/Leaching Behavior from Concrete Contaminated with Cs -Analysis of changes in mortar structure accompanied by dry-wet cycles- K. Kondo and I. Sato (R4115) .....	231
<b>CO10-4</b>	Modeling of slope-directed migration of Cs in forest soils Y. Motoie <i>et al.</i> (R4122) .....	232
<b>CO10-5</b>	Geological Standard Samples for Elemental Analysis of Accelerator Concrete G. Yoshida <i>et al.</i> (R4124) .....	233

<b>CO10-6</b>	Particle Size Measurement for Aerosol Particles Generated from Molten Gold Using a High-Frequency Induction Furnace System Y. Oki (R4090) .....	234
<b>12. Others</b>		
<b>CO12-1</b>	Survey on Radioactive Cesium Migration between Environment and Body of Wild Boar ( <i>Sus scrofa</i> ) Living in Fukushima Prefecture M. Fukushima <i>et al.</i> (R4003) .....	235
<b>CO12-2</b>	Synthesis of high-quality crystals for laser shock experiments: Implications for understanding the giant planet interiors Y. Umeda <i>et al.</i> (R4019) .....	236
<b>CO12-3</b>	Neutron Activation Analysis of High Purity Material T. Miura <i>et al.</i> (R4023) .....	237
<b>CO12-4</b>	Development of Value assignment method of Uranium Solution T. Miura and K. Takamiya (R4024) .....	238
<b>CO12-5</b>	Experimental Study of Superposition of Coherent Transition Radiation Using a Ring-type Resonator N. Sei and T. Takahashi (R4038) .....	239
<b>CO12-6</b>	The Third-year Trial to Analyze the Texture of Roof-tile: Toward Detailed Provenancial Studies of Excavated Ceramics by INAA M. Tomii <i>et al.</i> (R4050) .....	240
<b>CO12-7</b>	Study for activity measurement technique of radioactive xenon gases using a plastic scintillator T. Yamada <i>et al.</i> (R4064) .....	241
<b>CO12-8</b>	Development of Compensation Method for Faster Measurement with SPND C. H. Pyeon <i>et al.</i> (R4071) .....	242
<b>CO12-9</b>	SEM-EDS analysis of sprayed and dried particles from fine particles of (U,Zr)O <sub>2</sub> for decommissioning of Fukushima Daiichi Nuclear Power Plant A. Toyoshima <i>et al.</i> (R4075) .....	243
<b>CO12-10</b>	Testing of a N <sub>2</sub> -NBM readout setup at KUR CN-3 H. Ohshita <i>et al.</i> (R4094) .....	244
<b>CO12-11</b>	Structural Analysis of Additives in Lubricants by Small-Angle X-ray Scattering T. Hirayama <i>et al.</i> (R4120) .....	245
<b>CO12-12</b>	Nanostructural Analysis of Lubricant/Metal Interface by Neutron Reflectometry T. Hirayama <i>et al.</i> (R4121) .....	246
<b>CO12-13</b>	Study of Isotope Separation via Chemical Exchange Reaction R. Hazama <i>et al.</i> (R4155) .....	247
<b>CO12-14</b>	Development of neutron phase imaging system with Talbot-Lau interferometer for medium power reactor source Y. Seki <i>et al.</i> (R4156) .....	248
<b>CO12-15</b>	Fiber-reading Radiation Monitoring System with an Optical Fiber and Red-emitting Scintillator at the <sup>60</sup> Co Radiation Facility III S. Kurosawa <i>et al.</i> (R4171) .....	249
<b>II. PUBLICATION LIST (April 2022 – March 2023)</b>	.....	250