Hokkaido University
Leading Graduate School
Veterinary Science for One Health

The 3rd Leading Special Lecture

Excitements in Changing Scenario of Radiation Biology

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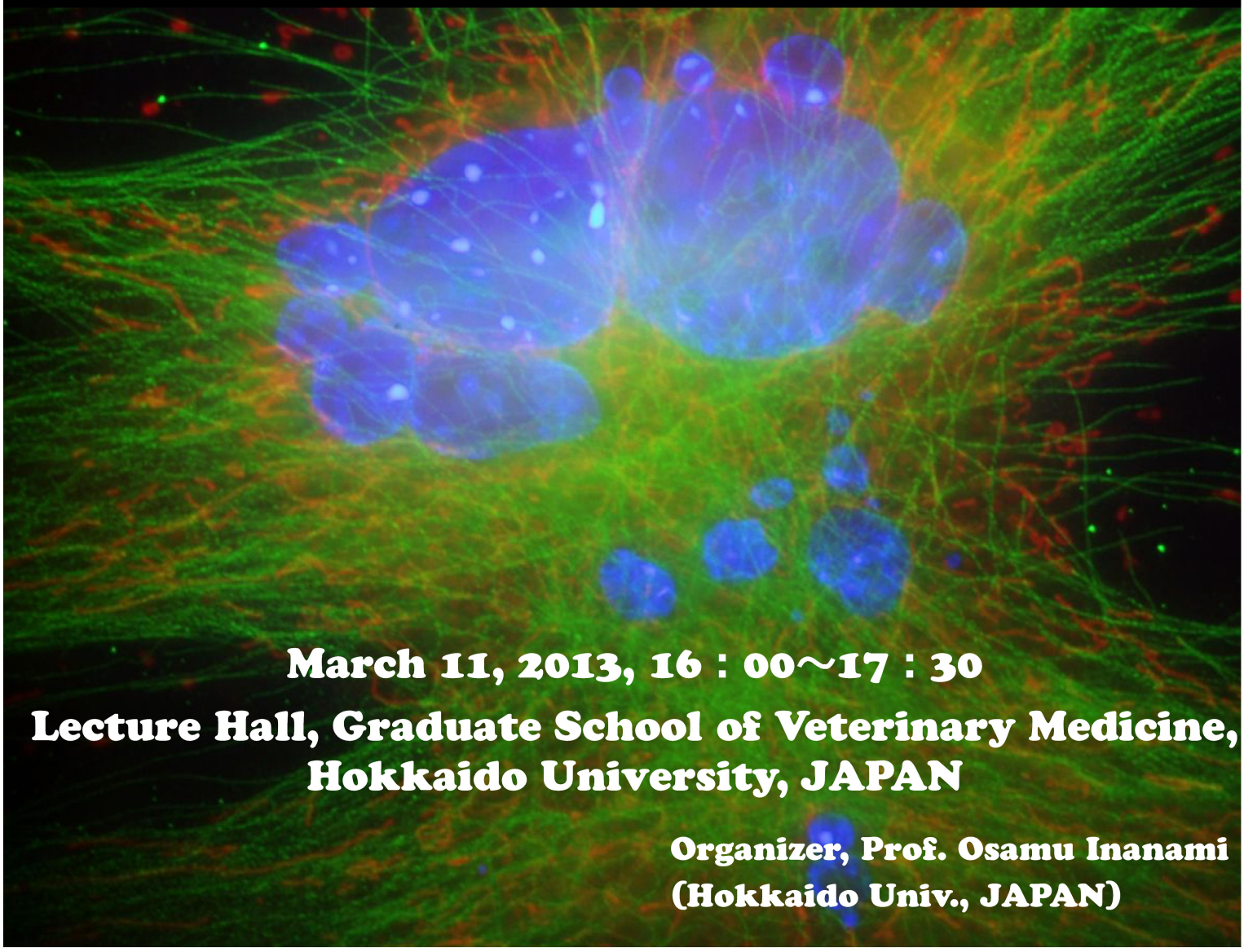

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(Hokkaido Univ., JAPAN)

THE 3rd LEADING SPECIAL LECTURE

EXCITEMENTS IN CHANGING SCENARIO OF RADIATION BIOLOGY : IMPLICATIONS TO ENVIRONMENT AND HEALTH

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Life originated in environment of ionizing radiation but it remained unmindful of human curiosity. At the end of 19th century, the discoveries of X rays and radioactivity revolutionized the world generating unusual hopes among scientists and common people raising the possibilities of treating diseases and panacea for every problem faced. But, harmful effects of radiation became known soon after these discoveries prompting new research for understanding the biological effects of ionizing radiation and thus giving birth to branch of radiation biology. Applications of ionizing radiation and radioisotopes in medical fields progressed rather rapidly and proved to become a familiar specialty as a powerful tool in hospitals to diagnose ailments and treat a variety of diseases including cancer. Extensive research on applications of nuclear energy found variety of novel applications in diverse areas ranging from biomedical research to weapon development. Radiation biology aims at understanding the biological effects of ionizing radiation to evaluate and predict the risk and to mitigate the injurious effects on public health. In modern times, radiation technology has been adequately exploited to optimize its uses in research, medicine, military, agriculture and industry. Over the past years, basic radiobiological research has significantly advanced our understanding of concepts and mechanisms of radiation action on living beings leading to formulation of radiation protection strategies for safety of individuals, progeny and human race. Radiobiological research has made important contributions to determine permissible dose limits to occupational workers and general population. The role of ionizing radiation in carcinogenesis and cancer radiotherapy owes heavily to radiation biological research progress. However, recent results in radiobiology have compelled scientists to re-examine the central dogma of radiation effects on living systems. The observed non-targeted effects called bystander effect, genetic stability and radio-adaptability phenomena have generated new excitements in research as these results have significant implications to radioprotection and cancer therapy protocols. I will broadly outline the hopes and challenges of nuclear technology in new millennium aimed to develop new strategies relevant to environment and human health. This talk is designed to give a brief account of basic aspects of radiation biological principles together with a review of emerging new paradigm with implications to using nuclear radiation for improvement of quality of life of people.

A Summary of 3rd Leading Special Lecture, Graduate Program of Hokaido University, March 11, 2013

Prof. Kaushala P. Mishra, Ph. D

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Visiting Professor
Tokyo Institute of Technology, Tokyo, Japan

EDUCATION:

B.Sc. University of Allahabad India 1966
M.Sc. University of Allahabad India 1968
Ph.D. University of Gujarat India 1979

OFFICIAL POSITION:

Vice Chancellor: Nehru Gram Bharati University (Deemed-to-be University of UGC) Jan., 2010 onwards
Ex Head: Radiation Biology and Health Sciences Division, Bhabha Atomic Research Center, Mumbai.
Retired as Scientific Officer H+ and Head of Division, BARC in 2006
Adjunct Professor: Institute of Technology, Manipal Academy of Higher Education (MAHE), Manipal 2002-2006
Adjunct Professor: Dept of Life Science, Mumbai Univ, Mumbai 2006-2009

ACADEMIC POSITION:

Fellow: The National Academy of Sciences, India, 2001
Fellow: Maharashtra Academy of Sciences, elected in 2001
Fellow: Microscopy Society of India, 2005
Fellow: International Academy of Physical Sciences, 2010

POSITION IN PROFESSIONAL SOCIETY:

Vice President: Vice President, Asian Association of Radiation Research, 2009-2012
Counselor: International Association of Radiation Research 2007-2011.
President: Indian Biophysical Society, 2005-2008
President: Indian Society for Radiation Biology, 2005-2007 and 2007-2009
President: Section of Biochemistry, Biophysics and Mol. Biology, 88th Indian Science Congress (2000-01)
Vice President: Asian Association of Radiation Research 2005-2009
Vice President: Society of Free Radical Research of India, 2003
Vice President: Bioelectrochemical Society of India 2003
Council Member: International Association of Radiation Research, 2008-2011
National Executive Council Member: Indian Biophysical Society, 1999-2001
General Secretary: Indian Biophysical Society, 2003
Executive Council Member: Asia -Pacific ESR Society, 2001-2003
Editor-in-Chief in Editoriaal board: Indian Journal of Radiation Research
Co-Editor: International J. Low Radiation, 2002 onwards
Co-editor: SFRR News Bulletin, 2003 onwards
Intl. Editorial Board Member: International Monogram series- Current Topics in Biophysics
Intl. Editorial Board Member: International Journal of Radiation Biology, 2009 onwards
Intl. Editorial Board Member: Journal of Environment, Pathology, Toxicology and Oncology since 2008
Editorial Board Member: Iranian J. Radiation Research, 2003 onwards

CURRENT MAJOR RESEARCH AND EDUCATIONAL INTERESTS:

- Use of Biotechnology and bioinformatics tools in cancer research
- Radiation Biology/Low Dose Radiat. Effect, Free Radical Biology, Oxidative Stress
- Cell Biotechnology

AWARDS/HONOURS:

Received **Medal of Honor in Radiobiology from Medical Academy**, Kazakhstan, Nov 19, 2010
Received **Annual Award of Society of Cancer Research And Communication**, Nov., 2010
Honored as **Icon of Allahabad by Indian Management Association**, Allahabad. Chapter, Allahabad.2010
Honored with conferment of **Fellowship of International Academy of Physical Sciences**, 2010
Awarded **Honorary Professorship 0by Kazakhstan Medical Academy**, Semipalatinsk, Kazakhstan, 2007
Awarded **Life Time Achievement Award of Indian Society for Radiation Biology**, 2006
Awarded **Distinguished Professor Visiting Fellowship by Sydney University**, Australia,2005
Received **Distinguished Science Award of Asia-Pacific ESR Society**, 2004
Received **ESR Spectroscopy Research Promotion Diplom Award from International EPR Society**, 2004

PUBLICATIONS (FOR RECENT 5 YEARS):

Vasumathy R, Pandey BN, **Mishra KP,** Oxidative stress-mediated apoptotic death in human peripheral blood lymphocytes treated with plasma from gamma-irradiated blood, J Environ Pathol Toxicol Oncol. 2012;31(1):1-6

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Pereira RV, Kumar A, Pandey BN, Jagtap AG and **Mishra KP**, Radiosensitization in human breast carcinoma cell by thymoquinone: role of cell cycle and apoptosis, Cell Biology International, 2011, 35:1025-9. PMID: 21557727.

Tiwari P, Kumar A, Balakrishnan S, Kushwaha HS, **Mishra KP**, Silibinin-induced apoptosis in MCF7 and T47D human breast carcinoma cells involves caspase-8 activation and mitochondrial pathway, Cancer Investigation. 2011, 29:12-20.

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Rajwade RP, Pande R, **Mishra KP**, Kumar A, Pandey BN, Hydroxamic Acids Analogous Against Breast Cancer Cells: 2D-QSAR and 3D-QSAR Studies, QSAR Comb. Sci. 28, 2009, No. 11-12, 1500–08.

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Rastogi L, Feroz S, Pandey BN, Jagtap A, **Mishra KP**, Protection against radiation-induced oxidative damage by an ethanolic extract of Nigella sativa L. Int J Radiat Biol. 2010 :86(9):719-31.
Bhosle SM, Ahire VR, Henry MS, Thakur VS, Huilgol NG, **Mishra KP**, Augmentation of radiation-induced apoptosis by ellagic acid., Cancer Invest. 2010 Mar;28(3):323-30.
Gupta S, Yadav BS, Kesharwani R, **Mishra KP**, Singh NK,The Role of Nanodrugs for Targeted Drug Delivery in Cancer Treatment,2010, Archives of Applied Science Research, 2 (1) 37-51
Yadav BS, Pokhariyal M, Ratta B, Rai G, Saxena M, Sharma B, **Mishra KP**, Predicting Secondary Structure of Oxidoreductase Protein Family Using Bayesian Regularization Feed-forward Backpropagation ANN Technique. 2010, J Proteomics Bioinform, 3: 179-182. doi:10.4172/jpb.1000137
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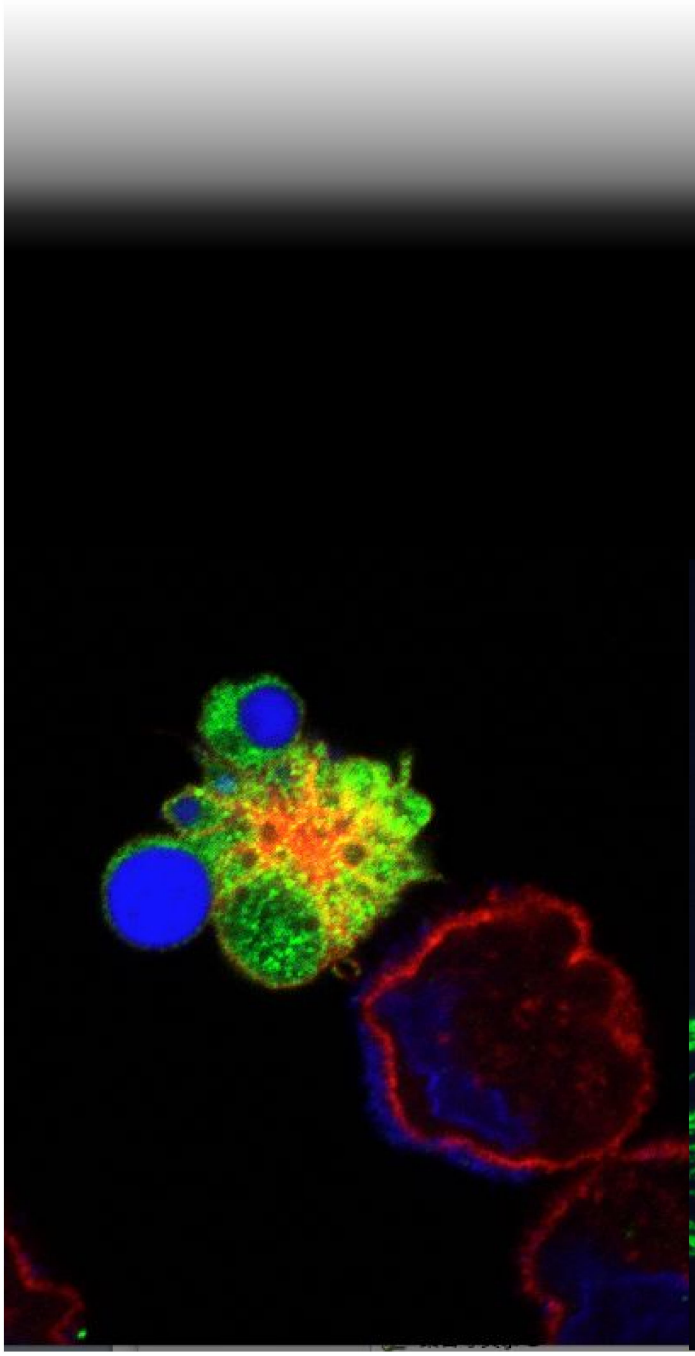

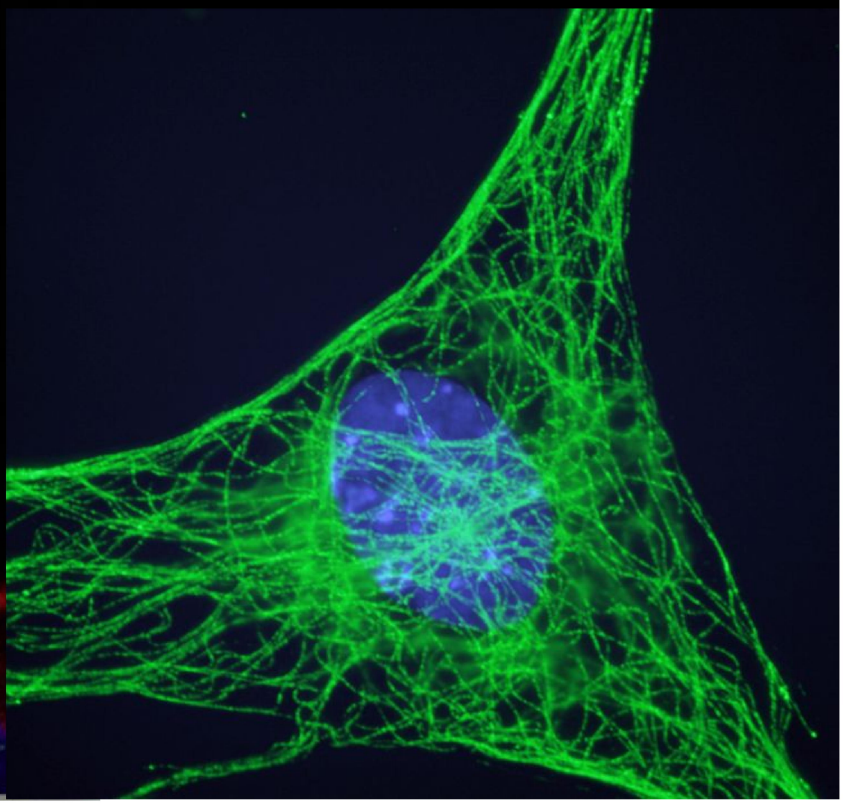

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