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RI-Biomics Technology for the Advance Radioisotope Application in Modern Life

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The RI-Biomics Center opened at ARTRI in the fall of 2013, and is a facility dedicated to improving the quality of life by developing advanced radioisotope applications in domains from basic biological sciences to the pharmaceutical industry. The RI-Biomics Center supports the research interests of a wide range of investigators from multiple disciplines, including academic biomedical sciences and the pharmaceutical industry, to elucidate the phenomena of life and evaluate the pharmacokinetics of drug candidates and medical bio-materials. We designed, build, and have put into routine use a radioisotope based total analysis system to handle the needs of a wide range of experiments from classic ^3H , ^{14}C based pharmacokinetic studies to small-animal molecular imaging studies using micro-SPECT/CT/PET, 7.0 T small-animal MRI, fluorescence optical imaging devices and autoradiography, etc.

The centre was designated as an Advanced Research Center for Nuclear Excellence in 2012 for development of RI-Biomics Bio-sensing application technology such as evaluation technology of life phenomena using 3D-ADMET(3-dimensional absorption, distribution, metabolism, excretion, toxicity study as advanced pharmacokinetic research), development of high value drug/functional food/medical devices or materials as well as advanced technology including GLP-like non-clinical study for the contribution on the improving quality of human life. The goal of RI-Biomics technology is to contribute to the peaceful application of radiation and radioisotopes through the development of advanced technologies for enhancing understand life phenomena. In pursuit of this goal our research focusses on the development of new technologies such as: a) SPECT/PET based 3D-ADMET study and classic $^{14}\text{C}/^3\text{H}$ based ADME study for support the pharmacokinetic information of new drug or toxicant from small synthetic chemicals to big biologics such as antibody, biomolecules, nano-materials and polymers); b) Radioisotope based biosynthesis of high value herbal resources used to alternative medicine to support the advanced evaluation for traditional medicines; c) Study of radiation effects on the living organisms such as microorganisms, cells, plant and experimental animals such as fishes and rodents; and d) Development of experimental systems for the study of radiation or radioisotope application such as screening the highly radiation-sensitive experimental animals, etc.

In addition, we are involving the professional and public education systems with the University of Science and Technology (UST), Korea

Association for Radiation Application (KARA) and National Research Foundation of Korea (NRF), etc., to contribute the enhancing public acceptance for radiation. In the future, we will start a programme sharing the effects of radiation on living organism and environment to enhancing the public acceptance of nuclear & radiation technology. After the Fukushima Daiichi nuclear disaster the public were seized with fear surrounding nuclear and radiation application. Currently we propose convergence research to enhance the public acceptance.

Country/Organization invited to participate

Korea, Republic of

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