

- Radiation measurement
- Low dose radiation effect
- Education and cooperation

Inter-regional association for nuclear accident

### 1. Research brief and purpose

This newly established lab conducts research and development into personal dosimetry and environmental radiation monitoring in preparation for a nuclear hazard. The lab specializes in track detection and luminescence method for personal dosimetry with image analysis, and in development on commercial product for a new automated biological cell culturing system for low-dose effect. This lab provides radiation education not only to students but also to local governments.

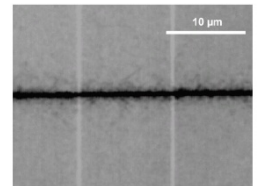
### 2. Establishments and current research subjects

#### ○Establishments

##### 「Visualization of radiation and measurement on nuclear reaction」

Invisible radiation can be visualized using its ionization processes in some materials.

Nuclear emulsion (photographic sensitive material) and CR-39 plastic (eyeglass lens material) are typical materials which can realize the visualization of radiation. This lab utilized these materials as radiation detector for space radiation dosimetry and for measurement on nuclear reactions for heavy ion cancer therapy. Current research efforts are concentrated in practical use of the “fluorescent nuclear track detector (FNTD)” which is a single crystals of aluminum oxide. This technique will be utilized as personal dosimeter. Right figure shows a track image of 400 MeV/n Krypton ion.



##### 「High speed imaging microscope」

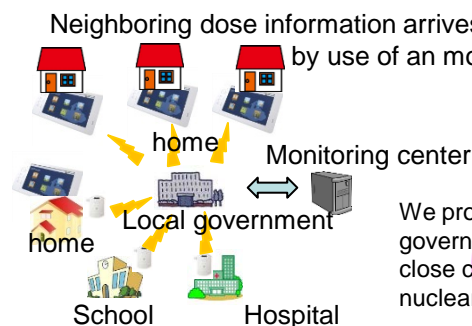
Those visualization techniques need microscope, and radiation measurements need “statistics” for the analysis. We’ve commercialized a microscope which can get microscopic images with a speed of 1cm<sup>2</sup>/min (100 times faster than traditional microscope) for this purpose under corporation with SEIKO precision, Inc. It is now utilized as routine personal dosimetry with CR-39 plastic detection for Japanese astronauts.



#### ○Research subjects

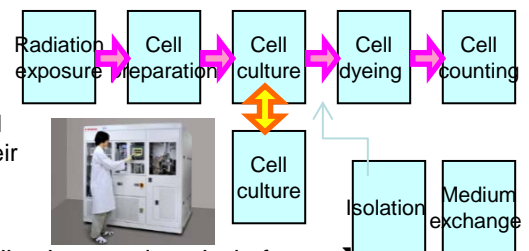
##### 「Dose information quick transfer system」

##### 「Automated cell analysis system for low-dose effect」



We promote knowledge spread in local government staffs and residents for their close cooperation in preparation for a nuclear hazard.

Automatic mass disposal of the cell culture and analysis for observing the rare phenomenon by low-dose radiation.



【 cell culture and analysis factory】

### 3. The appealing points and future views

#### Preparation (research)

- Radiation measurement
- Low dose radiation effect
- Radiation use

#### Association (outreach)

- Personnel training and education
- Knowledge spread
- Community outreach

Build communities strong against disasters

(Medicine / engineering corporation)

#### Message for student

We can realize the technology and knowledge exchange / fusion between the different fields (physics, biology, chemistry, engineering, information, international, education, communication, medical, environment, industry) on “radiation safety” with local government and companies.