Tritium concentration in the environment and genomic DNA.

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Tritium released into the environment is taken into our body through foods and breathe. Cancer is one of the most considered diseases caused by low level tritium. Tritium dose is measured in Sievert unit and controlled for radiological protection and total tritium dose is already estimated by some simulation codes such as NORMTRI which was used in our study.
On the other hand, the range of tritium β ray is about 5 to 10 μm in water. This is much shorter than human cell size. Cancer is initiated by damage on gene. In the case of eukaryotic cell including human cell, gene is localized in nucleus. Thus, tritium distribution in the cell and concentration in genomic DNA could be another index to assess tritium impact.
In order to assess tritium impact, to estimate total translation factor from tritium facility to genomic DNA may be important. Concentration and distribution of tritium in the environment is already estimated. Thus, in this study, we are planning to measure relationship between tritium concentration in the environment and in DNA, and to analyze tritium transfer from foods to DNA. As model organism, *E.Coli* (Bacillus coli) was chosen. This is because *E.Coli* has little nutrient requirement and it is easy to control the tritium/hydrogen ratio in cultivate environment. Although the cell structure of eukaryote (*E.Coli*) is very different from that of prokaryote (animal cell), it is said that the bio synthesis scheme of nucleic acid (DNA) is not different between these two organisms. We are planning to cultivate *E.Coli* under controlled tritium/hydrogen ratio. Therefore result of this study is expected to give useful information to estimate tritium intake into DNA. In addition the comparison of prokaryote and eukaryote may suggest the differences of biological effect of tritium on DNA coming from the environment.
We plan to integrate previous and out result, and investigate evaluation system of intake and impact of tritium in genomic DNA from environmental tritium.