



## Investigation of microbiomes in “Fossa Magna”, a great geographic rift dividing Honshu island of Japan with intriguing environments

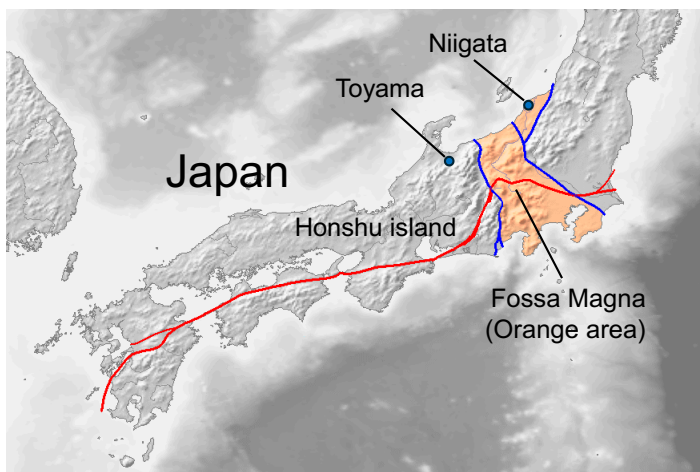
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In Japan, the border dividing Toyama and Niigata prefectures is a geologically and biologically attractive area where there are numerous hot springs with extreme environments: low and high pHs, high temperatures, and excess metal ions. The area is called the Fossa Magna where Honshu island was connected by two ancient islands, both of which were made when Japan had left from the Asian Continent. There are now high mountains of 3,000-meters range, steep ravines, and hot springs with various unique properties.

In our new project (April 2024 - March 2029), we will investigate microbiomes of these extreme environments (hot springs) and study their biological characteristics. Another important purpose of this project is to look for biotechnologically important enzymes that could be useful in the chemicals- and pharmaceuticals-production industries based on the microbiome data. We are also interested in discovering and isolating microorganisms from those extreme environments that have ancient genetic characteristics and features.

Our team has three principal investigators (PIs), two of them are belonging to Toyama Prefectural University (Taku Oshima and Tamotsu Kanai). The other PI belongs to Niigata University (Takashi Abe). They are all microbiologists, and each has specialties on biochemistry, genomics, or bioinformatics. Participants in this project will collect microbiome samples from hot springs, sequence their genomes, and search for



interesting enzymes from these bacteria and/or archaea under supervisions of these PIs. Finally, the interesting enzymes will be expressed in *E. coli* (or in other hosts) and their activities will be investigated. By the end of this project, you will have a fundamental knowledge on genomics, bioinformatics, and biochemistry. We sincerely hope you to join our project!

## Further Information of Toyama

Learn more about “Toyama Prefectural University”

- <https://www.pu-toyama.ac.jp/english/index.html>
- Department of Pharmaceutical Engineering, Faculty of Engineering  
<https://www.pu-toyama.ac.jp/english/faculty.html#09>

Learn more about “Toyama”

- Pharmaceutical industry in Toyama  
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