

# DISCOVERING THE UNTOLD STORIES OF EVOLUTION: ONE WOMAN'S CHALLENGE

*Evolutionary biology has made great strides in recent years through advancements in technologies such as DNA analysis. Working actively at the frontlines of this headline-making field is Dr. SAITOU Marie of the Norwegian University of Life Sciences. Here she speaks about the fascination of using science to unravel the mysteries of life and the new challenges she plans to take on.*

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Evolutionary biology employs the vast power of science to answer riddles about how living things have evolved since time immemorial. It is a field of intense interest, having made significant advancements in recent years due to innovations in technologies such as DNA analysis. Dr. Svante Pääbo, an evolutionary biologist who was the first in the world to successfully sequence the Neanderthal genome, was awarded the Nobel Prize in Physiology or Medicine in 2022. Ambitious research is currently underway around the world, and one Japanese researcher working actively on the frontiers of this field is Dr. SAITOU Marie, principal investigator (equivalent to assistant professor) at the Norwegian University of Life Sciences. "Since we can now analyze DNA contained in ancient bones, we are gaining a deeper understanding of extinct plants and animals. The true joy of evolutionary biology is to use this data to discover the unknown stories behind evolution," she says.

A study on Neanderthals published in 2021, based on research Saitou carried out during her postdoctoral period in New York, focused on the fact that analysis of DNA contained in their ancient bones exhibited a mutation of

"Genome sequencing and editing technologies are making advancements day by day, so I have to keep on learning. I often exchange opinions with researchers from other countries, who give me insights into their knowledge and expertise," says Dr. SAITOU Marie of the Norwegian University of Life Sciences. LISA MARIE BAUGE FJELLSBØ

the growth hormone receptor gene, which is associated with metabolism and growth. A study was conducted on children with malnutrition in Africa, where many people today carry this mutation, and it was found that a lower percentage of those children with the mutation had developed serious symptoms than those without it. Meanwhile, in a test in which both genome-edited mice with the same mutation and regular mice were fed a low-calorie diet, the male genome-edited mice became smaller



than the regular mice, and the females larger. Those results led Saitou to the conclusion that a similar phenomenon may have occurred in Neanderthals' bodies, increasing their chances of overcoming starvation, with men becoming smaller to save energy and women storing energy more efficiently to get through pregnancy.

Though analytical techniques are constantly advancing, such research still involves the ongoing process of trial and error. According to Saitou, "We often get results that were totally unexpected. But it's fascinating to see our studies develop in directions we had never imagined."

Saitou became interested in evolutionary biology when she was a college student. "I've always loved literature and the natural sciences, and I thought evolutionary biology had the double appeal of being a field of scientific study and one that looks at evolution as the long story of life." After earning her doctorate from the University of Tokyo, she went to the United States to pursue her studies further. Her research on Neanderthals and other endeavors were highly appraised by the Norwegian University of Life Science, and in 2020 she established her own research group there.

Since she had always been shy and not particularly adept at English, Saitou never dreamt that she would be active on the global stage someday, but she is now leading



Joining Saitou (sixth from left) are researchers from her research center at the Norwegian University of Life Sciences hailing from such countries as Jamaica, the U.K. and South Korea. In addition to managing a research budget and recruiting talent for her research team, Saitou lectures in a graduate course attended by some 80 students. "Although it's hard work, it is also very rewarding because I can make various decisions at my discretion." DOMNIKI MANOUSI

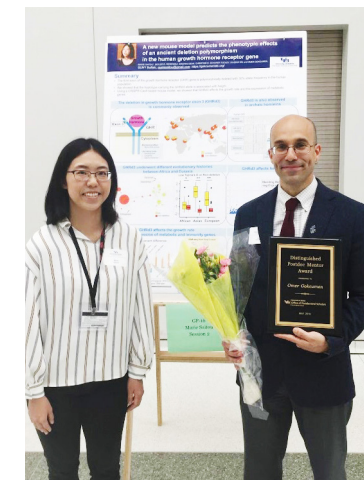
researchers from around the world in her team to take on new challenges. "Since I regularly interact with people of different nationalities and backgrounds, my horizons have broadened both personally and research-wise, and I have become able to think more freely."

She now plans to expand her research to include the study of life forms other than human beings, such as salmon. Understanding the evolution of living things can benefit a wide range of fields, from medicine to the environment. "Cancer cells, for example, develop from mutations. Evolutionary biology could be very helpful in elucidating their mechanisms and causal factors. In such a way, I want to contribute to industry and society," says Saitou. "I wish to continue using modern technology to unlock long-unsolved mysteries. And someday, I hope to discover facts that have never crossed anyone's mind." ●



In 2022, Saitou (front row, far right) was awarded the Recognition Prize of the First Marie Skłodowska Curie Award, which was established to contribute to the further advancement of female Japanese researchers. "This kind of award is very significant as the first step in promoting women in the sciences. I hope there will be more awards that put a spotlight on a broad range of people—not only those in academia, but also dedicated researchers in companies and those in outlying regions of the country."

EMBASSY OF THE REPUBLIC OF POLAND IN JAPAN



When working as a postdoctoral fellow in the United States, Saitou studied under Professor Omer Gokcumen (right) at the State University of New York in Buffalo, where she immersed herself in her research, including the study of Neanderthal DNA. Behind her is a poster describing the results of her research.