

FOSTERING THE NEXT GENERATION

白眉 — The Hakubi Project

A Unique Opportunity for Outstanding Young Talent

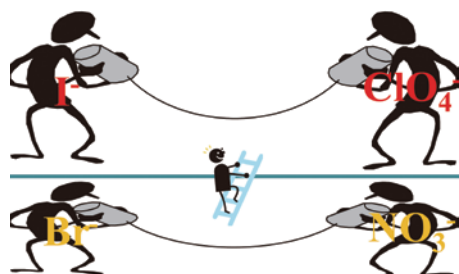
The Hakubi Project was established by Kyoto University in 2009 to foster outstanding young researchers. The program recruits twenty international researchers per year as associate and assistant professors. It gives them a valuable opportunity to devote themselves entirely to their research. The project is open to any researcher in any academic field. For further information please refer to the following website.

WEB www.hakubi.kyoto-u.ac.jp/eng

CHEM Unveiling the 125-year-old Mystery of Water

The origin of specific ion effects at the air-water interface.

Water is everywhere. Nevertheless, we human beings still don't fully understand this fundamental liquid. For example, we can't explain why some ions (e.g. SO_4^{2-}) in water precipitate proteins and prevent unfolding, while others (e.g. I) block the precipitation and increase the unfolding. Ions must play a role at the protein-water interface, but the origin of such specific ion effects, known as the Hofmeister effects, have been veiled for 125 years. Using a novel experimental method, Dr. Shinichi Enami found that ions interact with specific partners over long distances at the air-water interface. Furthermore, he showed evidence that such long-range specific ion effects are mediated by hydrogen-bonding networks of water at the interface. These findings may have significant implications —from reactions on droplets surfaces in the atmosphere to protein behavior in our bodies.

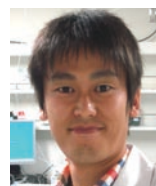


Ions interact with specific partners
via H-bond network of interfacial water

Dr. Shinichi Enami

*Associate Professor, The Hakubi Center
for Advanced Research*

www.rish.kyoto-u.ac.jp/labs/shiotani_lab/enami_web.pdf



HIST Islamic Dialogues with China

Uncovering the Wisdom of Chinese-speaking Muslims.



Chinese-speaking Muslims have inspired many researchers to seek a “dialogue among civilizations.” Establishing their own communities throughout China around the 16th century, they have maintained their own beliefs under non-Muslim political rule and social pressures, surviving until the present day as a minority.

Dr. Tatsuya Nakanishi is working to elucidate the wisdom which enabled their survival and co-existence with non-Muslims in China. How have they harmonized Islamic ideas with Chinese society and culture: Islamic law with Chinese law, Islamic mysticism with Chinese traditional thoughts (Confucianism, Buddhism, Taoism), and

traditional Islam in China with Islamic revivalism or modernism? Dr. Nakanishi endeavors to unlock these secrets by investigating original historical materials in Chinese, Arabic, Persian, and Turkish, in addition to undertaking fieldwork to uncover new privately-owned historical sources.

Dr. Tatsuya Nakanishi

Program-Specific Assistant Professor, The Hakubi Center for Advanced Research

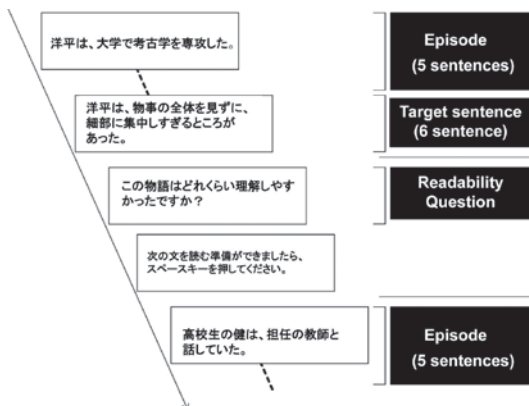
www.hakubi.kyoto-u.ac.jp/eng/02_mem/h24/nakanishi.html





PSHGH Episodic Memory Retrieval for Story Characters in Autism Spectrum Disorder

It is easier for people with autism to remember other people with autism.



with ASD characteristics may be able to help people with ASD.

Dr. Hidetsugu Komada's group has examined the recognition of stories among people with autism spectrum disorder (ASD). Story episodes (featuring characters with ASD or typically developing [TD] characters) and congruence (congruent or incongruent) were manipulated, and they found significant differences between ASD and TD groups in the recognition times. Whereas TD people retrieved TD episodes faster than ASD episodes, people with ASD retrieved congruent ASD stories faster than incongruent ASD stories. The results show that people with ASD deeply encode stories with congruent ASD episodes when reading stories about characters with ASD. ASD and TD groups reacted differently to those who are similar to themselves, and their patterns of doing so also differed. In terms of clinical implications, the study suggests that people



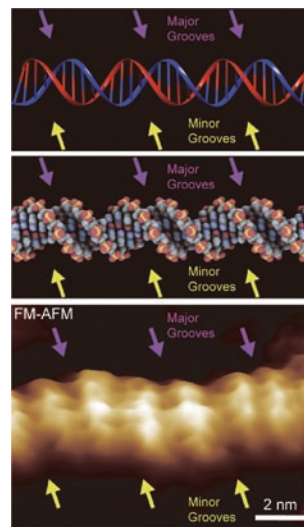
Dr. Hidetsugu Komeda

Program-Specific Associate Professor, The Hakubi Center for Advanced Research
researchmap.jp/komeda/?lang=english

NANO DNA Double Helix Resolved “Under a Microscope”

Major and Minor grooves, and individual phosphate groups identified.

The double helix structure of deoxyribonucleic acid (DNA) was first elucidated by Watson and Crick, based on X-ray studies, over a half century ago. Surprisingly, however, no one has ever been able to see the well-known double helix structure under a microscope. Dr. Kei Kobayashi, Dr. Hirofumi Yamada, and their colleagues recently developed an ultrahigh-resolution frequency modulation atomic force microscope (FM-AFM) that can visualize atoms and molecules in liquid environments. They successfully visualized the detailed structures of the DNA double helix in water. The major and minor grooves, and even individual phosphate groups were identified under a microscope for the first time. This work is a significant milestone in real-space biological imaging, and the FM-AFM will definitely be a powerful tool to elucidate the structures and functions of individual biomolecules *in vivo*.



Dr. Kei Kobayashi (left)

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Dr. Hirofumi Yamada (right)

Associate Professor, Graduate School of Engineering
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What's in a Name?

The term hakubi (白眉), literally means ‘white eyebrows’ in Japanese (白 : white, 眉 : eyebrows). The word originates from a Three Kingdoms era (220-280 AD) Chinese legend: “Three kingdoms saga (三国志)”. According to the legend, one of the kingdoms, called Shu (蜀), was home to five brothers with extraordinary talents. The fourth brother; 馬良季常 (Baryo Kijo), who was particularly outstanding, had white hairs in his eyebrows, and so the term hakubi has come to refer to particularly talented individuals.

