



RIKEN

A LEADER OPENING UP TO THE WORLD

RIKEN is Japan's most comprehensive research organization for basic and applied science. With institutes and facility sites across Japan and collaborations with research institutions worldwide, RIKEN is at the forefront of research in fields spanning the entire range of the natural sciences, from developmental biology and neuroscience to quantum physics and computer science. In 2012, RIKEN added the identification of element 113 and its contribution to the international Encyclopedia of DNA Elements (ENCODE) project to its long list of scientific achievements. Two new large-scale facilities, the RIKEN X-ray free-electron laser, known as SACLA, and the K computer, opened for shared use by Japanese and foreign researchers. RIKEN is also attracting an increasing number of foreign researchers, who are drawn by the institute's world-class research, state-of-the-art facilities and comfortable work conditions.

Lucky number 113

The RIKEN Wako campus, just outside Tokyo, is home to the RIKEN Nishina Center for Accelerator-Based Science where Kosuke Morita and his team created element 113. The team, from institutions across Japan and China, started the experiment in 2003 and since then has identified atoms of element 113

three times. The last and to date most unambiguous data was collected in experiments at the RIKEN Linear Accelerator and reported in September 2012. By firing zinc atoms at a bismuth film, the team produced a very heavy ion followed by a chain of six consecutive alpha decays identified as products of an isotope of element 113. "This has been a painstakingly long experiment," says Morita. "First, we had to create the 108th, 110th, 111th and 112th elements. This gave us confidence that we had the right experimental conditions to produce element 113. For our next challenge, we look to the uncharted territory of element 119 and beyond."

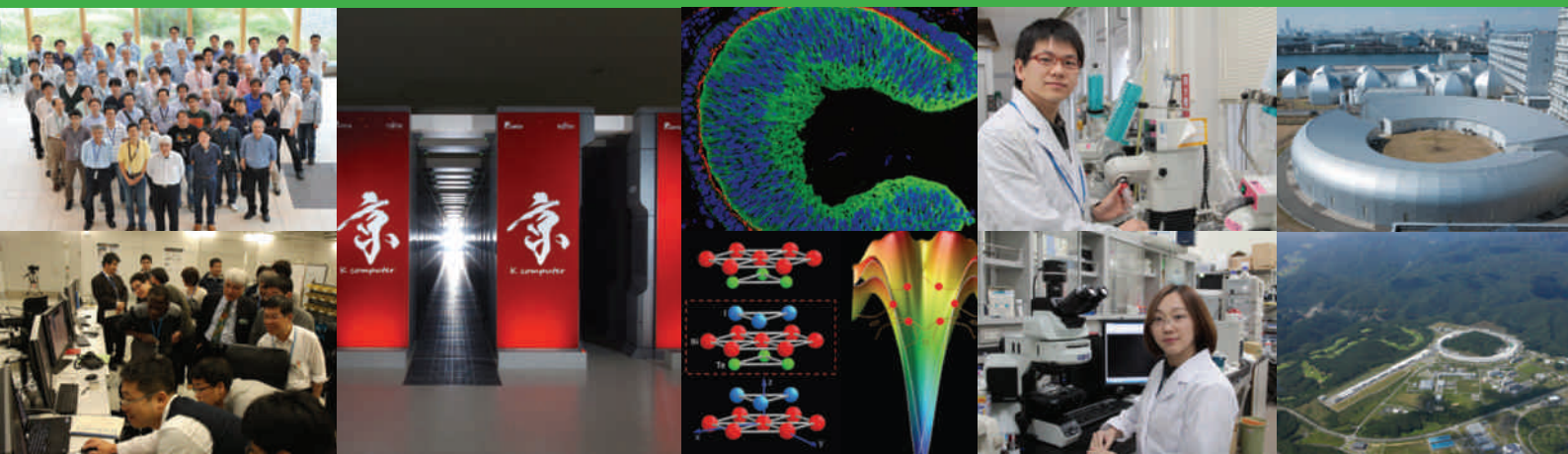
The ENCODE project

A group of researchers led by Piero Carninci, team leader of the RIKEN Omics Science

Center in Yokohama, contributed to the ENCODE project, an international research project funded by the National Human Genome Research Institute (NHGRI). ENCODE aims to identify all functional elements encoded in the human genome. Carninci's team contributed to the project by mapping RNA-transcribed regions using data on transcription starting sites gathered by RIKEN's original Cap Analysis Gene Expression (CAGE) technique. "Scientists at the RIKEN Omics Science Center are particularly pleased with this work because the CAGE technology, which was developed earlier, was employed as one of the standard technologies for analysing the output of the genome," explains Carninci. "This international collaboration is in line with the centre's mission to understand the function of the genome."



The **RIKEN Nishina Center for Accelerator-Based Science** is a leading accelerator complex where theoretical and experimental scientists collaborate in their exploration of the mysteries of nuclei. The centre has two main divisions: an experimental division, for accelerator research, and a theoretical division, for fundamental research in nuclear physics. The accelerators can handle a wide variety of different nuclei, providing unique opportunities for researchers to study the structure and properties of nuclei in great detail.



First-class facilities available to all

Two celebrated additions to RIKEN's suite of state-of-the-art large-scale facilities opened in 2012. SACLA, RIKEN's new X-ray free-electron laser, and the K computer are now available for shared use.

Located in Harima next to the SPring-8 synchrotron radiation facility, SACLA generates a very special X-ray laser beam equipped with the shortest wavelength in the world and extremely fast pulses. The facility will enable researchers to shed light on the nanoworld in three dimensions. Filming chemical reactions and unravelling the structure of biomolecules and nanostructures are examples of what can be achieved thanks to SACLA's ultra-fast beam.

RIKEN's K computer was developed in collaboration with Fujitsu and with the support of the Japanese government. The

supercomputer twice took first place in rankings of the world's fastest supercomputers and has won numerous awards. In September 2012 it opened for shared use by researchers in industry and academia. This supercomputing resource will provide researchers with unprecedented computing power, opening up opportunities for simulations at scales and complexities never before attempted.

Working at RIKEN

The proportion of foreign scientists working at RIKEN has increased steadily over the past 10 years. Thanks to programmes that create such positions as the Foreign Postdoctoral Researcher and the International Program Associate for PhD students, RIKEN is becoming increasingly attractive to young, non-Japanese researchers looking for an experience abroad. "RIKEN is a world-leading institution. I came here for an internship and liked it so much that I decided to stay for my PhD," explains Tong Bu, a PhD student from China. The quality of the research is the main reason young scientists choose RIKEN. "There are a lot of good scientists here, doing research that is cutting-edge," explains Philipp Gubler, a postdoctoral researcher coming from Switzerland. What appeals to Aron Beekman, who came from the Netherlands, is the fact that "everyone at RIKEN is really focused. It is a really stimulating and efficient work environment." Franco Nori, head of the digital materials team at the RIKEN Advanced

Science Institute, adds: "Many research visitors describe RIKEN as among the best places in the world to do research. There are many outstanding groups, and the environment is conducive to excellence."

Foreign researchers joining RIKEN are supported in a number of ways. The staff at the dedicated Central Help Desk is fluent in English and offers support at every step of the relocation process, from finding accommodation to opening a bank account and organizing childcare. Helplines in English are available and dedicated web pages offer foreign staff all the information they need to settle down in Japan. "Everyone gets first-class treatment here, that's why you never feel alone or unsupported," concludes Piero Carninci from the RIKEN Omics Science Center.

The RIKEN Omics Science Center and the RIKEN Brain Science Center are two of the few institutions in Japan to use English as their official work language, a clear sign that RIKEN is committed to facilitating exchange with researchers from outside Japan. These new exchanges will provide a powerful stimulus for new research into unexplored areas of science and consolidate RIKEN's presence on the international stage. For more information about job opportunities at RIKEN, please visit www.riken.jp. ■

The **RIKEN Omics Science Center** aims to advance the field of Omics, the comprehensive study of molecules in living organisms, by developing a system called the "life science accelerator" (LSA). The LSA is a multi-purpose, large-scale analysis system that rapidly analyses molecular networks, combining unique biological resources, human resources, technologies, know-how and essential administrative ability.



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