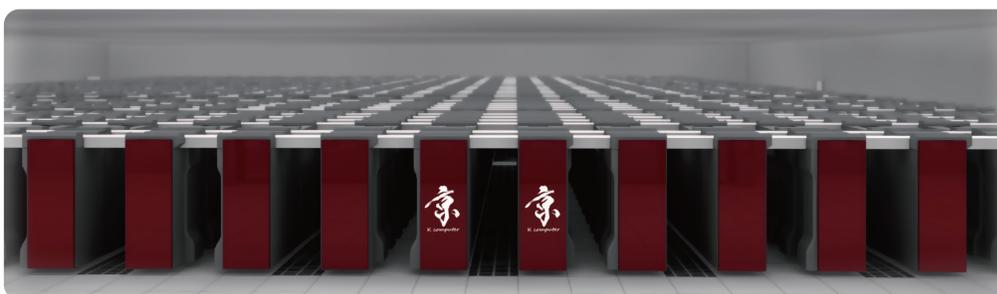
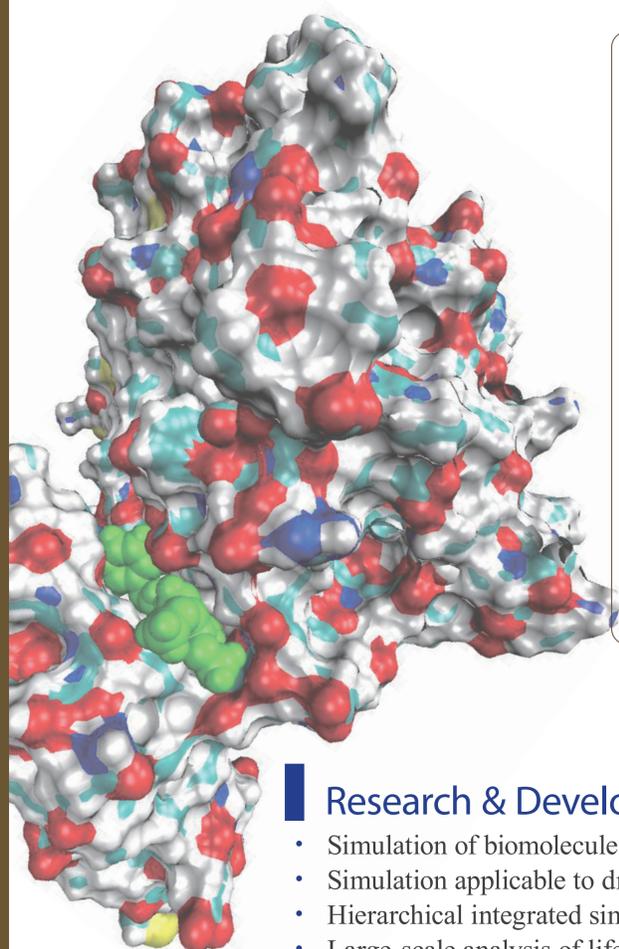


Supercomputational life science in Japan

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Abstract

The Japanese New Supercomputer—named “K” after the character 京, which stands for 10 to the 16th power—is an essential tool for advancing science and technology. The potential K offers for expanding basic research in materials science and the life sciences is clear. The HPCI Strategic Program, K computer project, is a five-year program of the Ministry of Education, Culture, Sports, Science and Technology (MEXT) aimed at fostering significant social and academic breakthroughs in five strategic fields: 1 Computational Life Science and Applications in Drug Discovery and Medical Development, 2. New Materials and Energy Generation, 3. Global change and the mitigation of natural disasters, 4. Industrial innovation, and 5. The origin of matter and the universe. In the field of Computational Life Science, we, RIKEN, have been developing applied computational sciences, collaborating with other universities and research institutes. In addition, we offer a number of technical workshops and seminars to the social and academic communities, and are working to develop human networks in computational life sciences.



The TOP500-ranked K computer system, currently in the configuration stage, has 672 computer racks equipped with a current total of 68,544 CPUs. This half-built system achieved the world's best LINPACK benchmark performance of 8.162 petaflops (quadrillion floating-point operations per second), to place it at the head of the TOP500 list. In addition, the system has recorded high standards with a computing efficiency ratio of 93.0%. This is the first time since June 2004, when the 'Earth Simulator' took first place, that a Japanese supercomputer has been ranked first on the TOP500 list. Broader utilization of the K supercomputer will commence in November 2012, following peer review of applications from interested researchers. A formal Request for Proposals will be issued early in the summer of 2012.

Research & Development

- Simulation of biomolecules under cellular environments
- Simulation applicable to drug design
- Hierarchical integrated simulation for predictive medicine
- Large-scale analysis of life data

Promotion of Computational Science and Technology

- Management of computational resources
- K computer user support

Public Outreach Activities

• Education

We provide support programs for high schools, universities and industries to encourage efforts computational life sciences.

• Workshops

We offer workshops for users and developers, and provide programming skills to enable effective and efficient utilization of advanced computational resources, including the K computer.

• Human Network

We organize symposia and seminars to introduce our HPCI program activities to life science communities.

• Public Relations

We disseminate information to increase public understanding and support of our program.



K computer

The original meaning for the *kanji* character “京”, a “large gate” is also appropriate, since the computer represents a new gateway to computational science. The name honors the past and links to the future.