Institute of Molecular and Cell Biology
A*STAR

PRESS RELEASE

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A*STAR scientists to play key role in landmark project to study genomes of 10,000 vertebrates

International project will generate important genetic information to benefit research and conservation efforts around the world

1. Scientists from A*STAR's Institute of Molecular and Cell Biology (IMCB) are participating in the Genome 10K Project to create a collection of tissue and DNA samples for 10,000 species of animals and sequence their genomes and analyse them to reveal their complete genetic heritage. Led by Prof Byrappa Venkatesh, who heads the Comparative Genomics Laboratory at IMCB and who is one of the chairpersons of the Genome 10K committee, the A*STAR scientists are part of an international team of about 70 leading scientists from major zoos, museums, research centres and universities in North and South America, Europe, Asia and Australia.

2. The Genome 10K Project aims to build up an invaluable repository of DNA sequences for conducting comparative studies on a scale never done before. This will enable scientists to understand the genetic basis of adaptive changes that occur in vertebrates and predict how animals respond to climate change, pollution, emerging diseases, and competition, and thus help in conservation efforts. Having complete animal genomes at hand will also enable scientists to compare animal and human genomes, and reconstruct the evolutionary history of the human and other vertebrate genomes.

3. Nobel Laureate Dr Sydney Brenner, who is Scientific Advisor to A*STAR Chairman and co-heads the IMCB laboratory with Prof Venkatesh, said, “The most challenging intellectual problem in biology for this century will be the reconstruction of our biological past so we can understand how complex organisms such as ourselves evolved. Genomes contain information from the past – they are molecular fossils – and having sequences from vertebrates will be an essential source of rich information.”

4. Said Prof David Haussler, Professor of Biomolecular Engineering at University of California, Santa Cruz, and one of the initiators of the Genome 10K project, “For the first time, we have a chance to really see evolution in action, caught in the act of changing whole genomes. This is possible because the technology to sequence DNA is thousands of times more powerful now than it was just a decade ago, and is poised to get even more powerful very soon.” The other two initiators of the project are Dr Stephen J. O’Brien, Chief of the Laboratory of Genomic Diversity at the National Cancer Institute and Prof Oliver A. Ryder, Director of Genetics at the San Diego Zoo's Institute for Conservation Research and Adjunct Professor of Biology at UC San Diego. The proposal for the project, launched in April 2009, is outlined in a paper entitled “A proposal to obtain whole genome sequence for 10,000 vertebrate species”, which will be published in the *Journal of Heredity* on November 5, 2009.

5. Said Prof Venkatesh, “This project will not only generate sequences of all important vertebrate genomes that we were contemplating to sequence, but also will give us access to the latest sequencing technologies and sequence analysis tools for genomic studies in Singapore.” Agreeing, Prof Neal Copeland, Executive Director of IMCB, added, “We are delighted and honoured that IMCB is participating in this momentous project, which is a fine example of the international nature of science. Following the successful revelation of the fugu genome in 2002, IMCB is looking forward to making even more important contributions to the international field of genomics through the Genome 10K project and remains committed to using the tools of modern science to make important, basic discoveries that will advance the understanding of the human genome and diseases.”

Milestones in comparative genomics by IMCB

6. Prof Venkatesh is well-known for his experience and success in sequencing fish genomes, including that of the famed fugu (or pufferfish) and elephant shark. His laboratory at IMCB, which comprises 14 scientists including DNA sequencers, bioinformaticians and wet-lab biologists, has published significant findings on the human and fish genomes in renowned journals such as *Nature*, *Science*, *PLoS Biology* and *Genome Research*. Major genome projects in which IMCB has taken the lead in recent years include:

- 2000: Initiated and led the International Fugu Genome Consortium
- 2002: Sequenced and annotated the complete fugu genome
- 2005: Identified the elephant shark as a novel model vertebrate genome
- 2007: Secured generous funding from the National Institutes of Health, USA, to sequence the whole genome of the elephant shark

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AGENCY FOR SCIENCE, TECHNOLOGY AND RESEARCH

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Notes to the Editor:

The research proposal described in the press release can be found in the following article, “A proposal to obtain whole genome sequence for 10,000 vertebrate species”, published in the 5 Nov 2009 online issue of *Journal of Heredity.*
Authors: Genome 10K Community of Scientists
(For the full author list, please refer to the article in *Journal of Heredity* online.)

About the Institute of Molecular and Cell Biology (IMCB)
The Institute of Molecular and Cell Biology (IMCB) is a member of Singapore's Agency for Science, Technology and Research (A*STAR) and is funded through A*STAR's Biomedical Research Council (BMRC). It is a world-class research institute that focuses its activities on six major fields: Cell Biology, Developmental Biology, Genomics, Structural Biology, Infectious Diseases, Cancer Biology and Translational Research, with core strengths in cell cycling, cell signalling, cell death, cell motility and protein trafficking. Its achievements include leading an international consortium that successfully sequenced the entire pufferfish (fugu) genome. The IMCB was awarded the Nikkei Prize 2000 for Technological Innovation in recognition of its growth into a leading international research centre and its collaboration with industry and research institutes worldwide. Established in 1987, the Institute currently has 35 independent research groups with more than 400 staff members.

For more information about IMCB, please visit www.imcb.a-star.edu.sg

About the Agency for Science, Technology and Research (A*STAR)
The Agency for Science, Technology and Research (A*STAR) is the lead agency for fostering world-class scientific research and talent for a vibrant knowledge-based and innovation-driven Singapore. A*STAR oversees 14 biomedical sciences, and physical sciences and engineering research institutes, and seven consortia & centre, which are located in Biopolis and Fusionopolis, as well as their immediate vicinity.

A*STAR supports Singapore's key economic clusters by providing intellectual, human and industrial capital to its partners in industry. It also supports extramural research in the universities, hospitals, research centres, and with other local and international partners.

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About the Genome 10K Project
The Genome 10K project aims to assemble a genomic zoo — a collection of DNA sequences representing the genomes of 10,000 vertebrate species, approximately one for every vertebrate genus. The trajectory of cost reduction in DNA sequencing suggests that this project will be feasible within a few years. Capturing the genetic diversity of vertebrate species would create an unprecedented resource for the life sciences and for worldwide conservation efforts.

The growing Genome 10K Community of Scientists (G10KCOS), made up of leading scientists representing major zoos, museums, research centres, and universities around the world, is dedicated to coordinating efforts in tissue specimen collection that will lay the groundwork for a large-scale sequencing and analysis project.

For more information, please visit http://genome10k.soe.ucsc.edu/