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For immediate release

## Argonne-University of Chicago joint venture bolsters genomic sequencing capabilities

ARGONNE, Ill. (June 9, 2008) – The Institute for Genomics and Systems Biology (IGSB), a joint venture of the U.S. Department of Energy's (DOE) Argonne National Laboratory and the University of Chicago, has acquired two new instruments that provide an enhanced ability to sequence genomes more quickly and broadly.

"Sequencing used to be like locating a golf ball by searching only on the fairway, but not the rough," said IGSB Director Kevin White. "It used to be that only species that could be cultivated, or grown in pure culture, could be sequenced. The capabilities of the new Roche 454 FLEX and Illumina Solexa Genome Sequencer now allow scientists that use the machines to skip the cultivation step. Eliminating that step will save time and speed up the research process, while maintaining accurate sequencing results."

The 454 FLEX is ideally suited for studying microbial communities by *de novo* sequencing. It provides 400,000 DNA fragments of about 250 base pairs each – or 100 million base pairs per run – that represent either a significant part of the genome of a single organism or a random snapshot of parts of multiple genomes.

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genomic sequencing – add one

The Solexa Genome Sequencer is targeted at resequencing. Compared to the Roche 454 FLEX, it generates more but shorter reads, creating 40 million reads with a current read length of 18 to 36 base pairs – or about 1 billion base pairs per run – depending on the application.

The machines were purchased to facilitate research for three Argonne Laboratory-Directed Research and Development projects. A project led by Michael Miller, a terrestrial ecologist, and Folker Meyer, a computational biologist in IGSB, will enhance our understanding of soil CO<sub>2</sub> sequestration capability on the microbial level.

In another project, Argonne's soil ecology group is using metagenome sequencing to study the microbial population in chronoserries plots at DOE's Fermi National Accelerator Laboratory. In a third project, Argonne's environmental remediation program is studying the role played by microbial communities in subsurface remediation of inorganic contaminants using metagenome sequencing.

IGSB's sequencing group plays an active role in the design and optimization of experiments using DNA sequencing technology, such as developing and optimizing protocols for DNA isolation from environment as diverse as subsurface soil and plant leaves. The group also works with researchers to develop protocols for DNA extraction and to conduct downstream bioinformatics analyses.

The new machines are also open to other Argonne and University of Chicago researchers who need genetic samples sequenced. In the near future, the sequencing instruments will be available to select peer-reviewed proposals from researchers from other organizations.

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Argonne's genomics research is primarily funded DOE's Office of Science, which supports research that provides a fundamental scientific understanding of plants and microbes necessary to develop strategies for sequestering carbon gases, producing biofuels and cleaning up waste.

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