

OpGen Announces Sequence Assembly and Finishing of First Reference Genome of Domestic Goat - See more at: <http://opgen.com/news/press-releases#sthash.IZ7mrXIV.dpuf>

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Whole Genome Mapping Technology Plays Integral Role in International Study

Gaithersburg, Md.—December 26, 2012—OpGen, Inc. today announced its ARGUS® Whole Genome Mapping System technology was used in combination with next-generation sequencing (NGS) to produce the first, high-quality reference genome of the domestic goat. The study, which was led by BGI-Shenzhen and Kunming Institute of Zoology, Chinese Academy of Sciences was published online today in Nature Biotechnology. The paper, titled [Sequencing and automated whole-genome optical mapping of the genome of a domestic goat \(*Capra hircus*\)](#), demonstrates the value, efficiency and cost effectiveness of OpGen's Whole Genome Mapping in de novo assemblies of large, complex genomes.

"This independent technology provides not only the validation of the genome sequencing, but also provides the large-scale chromosome structure information that cannot be detected by sequencing," said Xun Xu, Deputy Director, BGI-Shenzhen. "The experience in these genome assembly projects shows that the physical whole genome map should be the standard for any reference genome to be assembled in the future."

Goats are an important economic resource in many developing countries around the globe, including China and India. However, despite their agricultural and biological importance, breeding and genetic studies of goats have been hindered by the lack of a high-quality reference genome sequence. The goat genome is the first high-quality reference genome for small ruminant animals and may help to advance the understanding of distinct ruminant genomic features from non-ruminant species.

Although generating draft assemblies from NGS is relatively easy, finishing a sequence to the chromosome level is still difficult and costly. The findings show that a single NGS platform, when combined with Whole Genome Mapping, can produce a finished assembly much faster and less expensively than other currently available mapping strategies such as bacterial artificial chromosome (BACs) or fluorescence in situ hybridization (FISH). This approach sets the gold standard in large genome de novo assembly, eliminating the need for genetic maps which can be very time consuming.

"By incorporating Whole Genome Mapping, we were able to overcome the limitations of NGS' short read scaffolds to produce long super-scaffolds and finish the assembly to the near chromosome level," said Wen Wang, Deputy Director, Kunming Institute of Zoology, Chinese Academy of Sciences and an author of the paper. "We could not have completed the project without OpGen's technology."

In the study, OpGen's ARGUS® system produced 100,000 single molecule restriction maps in three hours. This resulted in 30 times the physical coverage of the goat genome. The company's Genome Builder™ software generated long super-scaffolds by combining single molecule map data with sequence scaffolds generated by NGS and subsequent assembly. Specifically, the metric of assembly (N50) was improved eightfold by combining Whole Genome Mapping with NGS over NGS alone.

“While we continue to demonstrate the value of Whole Genome Mapping for assembly, quality control and validation of microbial genomes, we are pleased to expand its applications as a critical, complementary technology enabling investigators to provide complete and accurate long-range genomic information in complex, de novo projects,” said Richard Moore, M.D., Ph.D., chief scientific officer of OpGen and an author of the paper. “This paper is the first of many we expect to be published over the next year which will validate OpGen’s Whole Genome Mapping technology as a solution for the de novo assembly of the spectrum of genomes from microbes to mammals.”

About ARGUS® Whole Genome Mapping System

OpGen’s ARGUS® Whole Genome Mapping System is the only commercially available technology that can provide a high-resolution, complete visual map of a whole genome and individual chromosomes. The company’s unique single molecule analysis technology provides a whole genome view that complements genome assembly and enables scientists to identify highly repetitive regions, tandem repeats and translocations that are very difficult to identify and clarify with sequencing alone. Sequencing projects can now be finished and validated with less investment in time, cost and computational effort.

About OpGen, Inc.

OpGen, Inc. is a leading innovator in providing rapid, accurate genomic and DNA analysis systems and services. The company’s ARGUS® Whole Genome Mapping System, GenomeBuilder™ and MapIt® Services provide high-resolution, whole genome maps for sequence assembly and finishing, strain typing and comparative genomics in the life sciences market. OpGen’s powerful technology dramatically improves the quality of data and time-to-results by providing sequence information from single DNA molecules more rapidly and less expensively than previously possible. The company is dedicated to positively influencing individual healthcare outcomes, advancing scientific research and enhancing public health by delivering precise, actionable information and results to customers in the life science and healthcare communities. OpGen’s customers include leading genomic research centers, biodefense organizations, academic institutions, clinical research organizations and biotechnology companies. For more information, visit www.gbbetasite.com/opgen