

BioNano Genomics Highlights Results from Next-Generation Mapping Study of Large Yellow Croaker Published in *BMC Genomics*

First whole genome map assembly by next-generation mapping with the Irys® System for non-model aquatic animal genome

SAN DIEGO, CA – October 15, 2015 – BioNano Genomics, Inc., the leader in physical genome mapping, today announced results from a study validating the ability of next-generation mapping to construct the first whole-genome map for large yellow croaker. The large yellow croaker is an economically important commercial fish in China and East Asia that faces environmental challenges. The Irys® System was used to map the genome to better explore functional genes that may be useful in breeding new large yellow croaker varieties with traits to ensure population sustainability.

Findings from the study, entitled "[Rapid construction of genome map for large yellow croaker \(*Larimichthys crocea*\) by the whole-genome mapping in BioNano Genomics Irys System](#)," were published online in the peer-reviewed journal *BMC Genomics*.

The study, conducted by Xiao, *et al*, at the Key Laboratory of Healthy Mariculture, Fisheries College at Jimei University, China, and Genergy Ltd where the first Irys System was installed in China, assessed BioNano's high-throughput next-generation mapping (NGM) technology to assemble the first whole-genome map of the large yellow croaker, which facilitates the ongoing genomic and evolutionary studies of the species, marking the first public report on genome map construction by whole-genome mapping for aquatic organisms. Success with this demonstrates a promising application of whole-genome mapping for other non-model organisms in a rapid and reliable manner.

Han Cao, Ph.D., Chief Scientific Officer of BioNano Genomics, commented, "This study demonstrates a valuable example of real-world application to rapidly construct whole-genome map without reference using the Irys System. The alternatives being extremely time- and labor-consuming, the use of the Irys System to generate a physical map identifying functional genes for the species facing environmental challenges is very appealing to researchers. The study provides a framework reference to assemble whole genome *de novo* maps for non-model species, further advancing genomics research by enabling sequence assembly studies, evolutionary investigations and map-based gene identification studies. The publication further validates the speed, throughput, accuracy, unbiased complete coverage and ease of use of BioNano Genomics' revolutionary next-generation mapping technology and illustrates how this technology can positively impact the ecological and commercial aspects of breeding."

Construction of the yellow croaker's whole genome map was validated using the draft genome sequences obtained from previous studies through a hybrid 'super-scaffolding' alignment. These findings have the potential to open up opportunities to explore functional genes that may be useful in breeding new large yellow croaker varieties with enhanced economic traits and higher anti-infection characteristics to meet modern aquaculture industry requirements.

About the Irys® System

The Irys® System can provide valuable insights about the biology of the genome based on information about the order, orientation, arrangement, and interaction of genomic components. Irys also works as a complement to read-based sequencing technologies to yield long-range genomic information, identify structural variations and bridge repeats and other complex elements in the genome. The Irys System uses IrysPrep® Reagents to extract and label long DNA molecules and the IrysView and IrysSolve® software to provide powerful *de novo* assemblies and analysis of the genome.

About BioNano Genomics

BioNano Genomics, Inc., the leader in next-generation mapping (NGM), provides customers with genome analysis tools that advance human, plant, and animal genomics and accelerate the development of clinical diagnostics. The Company's Irys® System uses NanoChannel arrays integrated within the IrysChip® to image genomes at the single-molecule level with average single-molecule lengths of about 350,000 base pairs, which leads the industry. The long-range genomic information obtained with the Irys System helps decipher large, complex DNA repeats, which are the primary cause of inaccurate and incomplete genome assembly.

On its own, next-generation mapping with the Irys System enables detection of structural variants, many of which have been shown to be associated with human disease as well as complex traits in plants and animals. As a companion to next-generation sequencing, next-generation mapping with the Irys System integrates with sequence assemblies to create contiguous hybrid scaffolds that reveal the highly-informative native structure of the chromosome.

Only BioNano Genomics provides long-range genomic information with the cost-efficiency and throughput to keep up with advances in next-generation sequencing.

The Irys System has been adopted by a growing number of leading institutions around the world, including: National Cancer Institute (NCI), National Institutes of Health (NIH), Wellcome Trust Sanger Institute, Broad Institute of MIT and Harvard, BGI, Garvan Institute, Salk Institute, and McDonnell Genome Institute of Washington University. Investors in the Company include Battelle Ventures, Domain Associates, Legend Capital, Novartis Venture Fund, Federated Kaufmann, Monashee Investment Management, and Gund Investment Corporation.

For more information, please visit us at www.BioNanoGenomics.com.

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