Bionano Corporate Overview

December 2024

Safe harbor statement - This presentation contains forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. Words such as “may,” “will,” “expect,” “plan," anticipate,” “estimate,” “intend,” “should,” “believe,” “would,” “could,” “potential,” “outlook,” “guidance,” “goal” and similar expressions (as well as other words or expressions referencing future events, conditions or circumstances and the negatives thereof) convey uncertainty of future events or outcomes and are intended to identify these forward-looking statements. Forward-looking statements include statements regarding our intentions, beliefs, projections, outlook, analyses or current expectations concerning, among other things: (i) our expectations regarding product uptake, revenue growth, market development and adoption of OGM, including growth in publications highlighting the utility and applications of OGM; (ii) our growth prospects and future financial and operating results; (iii) growth of our OGM system installed base and sales of our flowcells; (iv) increase in the adoption and utilization of OGM; (v) the impact of our investment in R&D and commercial and educational initiatives, including timely and successful launch of our planned product developments and clinical study results; (vi) our ability to stay in front of competitors' improvements; (vii) our estimates of anticipated market opportunity and underlying assumptions; (viii) our quarterly and annual revenue outlook; (ix) the anticipated benefits and success of our collaborations; (x) the anticipated benefits of our cost savings initiatives and our ability to realize the planned savings; and (xi) other statements that are not historical facts.

Each of these forward-looking statements involves risks and uncertainties. Actual results or developments may differ materially from those projected or implied in these forward-looking statements. Factors that may cause such a difference include the risks and uncertainties associated with: (i) the impact of global and macroeconomic events, such as recent and potential future bank failures, inflation, supply chain disruptions, and the ongoing Ukraine-Russia and Israel-Hamas conflicts and related sanctions, on our business and the global economy; (ii) challenges inherent in developing, manufacturing and commercializing products; (iii) our ability to further deploy new products and applications and expand the markets for our technology platforms; (iv) third parties’ abilities to manufacture our instruments and consumables; (v) our expectations and beliefs regarding future growth of the business and the markets in which we operate; (vi) the accuracy of our estimates; (vii) our ability to obtain financing to fund our operations and continue as a "going concern"; (ix) the success of our cost savings initiatives and our ability to realize the planned savings; (x) he success of products competitive with our own; (xi) changes in our strategic and commercial plans; and (xii) the application of generally accepted accounting principles which are highly complex and involve many subjective assumptions. We are under no duty to update any of these forward-looking statements after the date of this presentation to conform these statements to actual results or revised expectations, except as required by law. You should, therefore, not rely on these forward-looking statements as representing our views as of any date subsequent to the date of this presentation. Except as required by law, neither we nor any other person assumes responsibility for the accuracy and completeness of the forward-looking statements contained in this presentation.

More information about these and other statements, risks and uncertainties is contained in our filings with the U.S. Securities and Exchange Commission, including, without limitation, our Annual Report on Form 10-K for the year ended December 31, 2023 and in other filings subsequently made by us with the Securities and Exchange Commission. All forward-looking statements contained in this presentation speak only as of the date on which they were made and are based on management’s assumptions and estimates as of such date. We do not undertake any obligation to publicly update any forward-looking statements, whether as a result of the receipt of new information, the occurrence of future events or otherwise except as required by law.

To supplement our financial results reported in accordance with U.S. generally accepted accounting principles (GAAP), we have provided certain non-GAAP financial measures, including gross margin and operating expense in this presentation. A description of these non-GAAP financial measures as well as a reconciliation to the nearest GAAP financial measures are included at the end of the Company’s earnings release issued associated with this presentation, which has been posted on the investor relations page of the Company’s website. Because of the non-standardized definitions of non-GAAP financial measures, the non-GAAP financial measures as used in this presentation and the associated reconciliation table have limits in its usefulness to investors and may be calculated differently from, and therefore may not be directly comparable to, similarly titled measures used by other companies. For certain non-GAAP financial measures we do not provide guidance for the most directly comparable GAAP measures and similarly we cannot provide a reconciliation between our most directly comparable GAAP measures without unreasonable effort due to the unavailability of reliable estimates for certain components which are not within our control and may vary greatly between periods and could significantly impact our financial results calculated in accordance with GAAP.

We believe that non-GAAP financial measures in this presentation are useful to investors and analysts as a supplement to our financial information prepared in accordance with GAAP for analyzing operating performance and identifying operating trends in its business. We believe these measures allow for greater transparency with respect to key financial metrics we use in assessing our own operating performance and making operating decisions. These non-GAAP financial measures are not meant to be considered in isolation or as a substitute for comparable GAAP measures and should be read in conjunction with our consolidated financial statements prepared in accordance with GAAP.

Bionano is transforming the way the world sees the genome

Pioneered a method for structural variant (SV) detection called optical genome mapping (OGM)

- **OGM consolidates 3 legacy cytogenetic methods** into one assay
- **It complements sequencing** as a new tool
- **Consistently finds more actionable variants** in days vs. weeks at a substantially lower cost

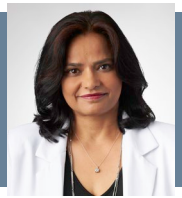
Commercial stage, tools & Dx Co with TTM of $36.6 M in sales with platform for genome analysis

- **Strategic focus on driving growth in utilization** of OGM consumables supported by the existing install base of ~360 OGM systems
    - Revenue growth through *menu expansion* and end-to-end workflow improvements
- **Targeting academic medical centers and commercial reference labs:** research applications are cancer, cell and gene therapy, and constitutional genetic disease
- **Estimated OGM TAM:** $10B and 10K labs running ~10M samples/year + 2.4M samples for cell and gene therapy

Executive Team

Erik Holmlin, PhD
President and Chief Executive Officer
Joined 2011

Mark Oldakowski
Chief Operating Officer
Joined 2014



Alka Chaubey, PhD
Chief Medical Officer
Joined 2020

Traditional methods in use today for SV detection are outdated and leave a significant number of questions unanswered

Traditional cytogenetics requires multiple methods that are labor intense, time-consuming, repetitive & costly

Karyotyping

Up to 4 weeks for results

FISH
(fluorescence *in-situ* hybridization)

4-6 different probes per sample & successive testing

Microarrays

Detect CNVs only

Clinical utility of traditional cytogenetic analysis is severely limited

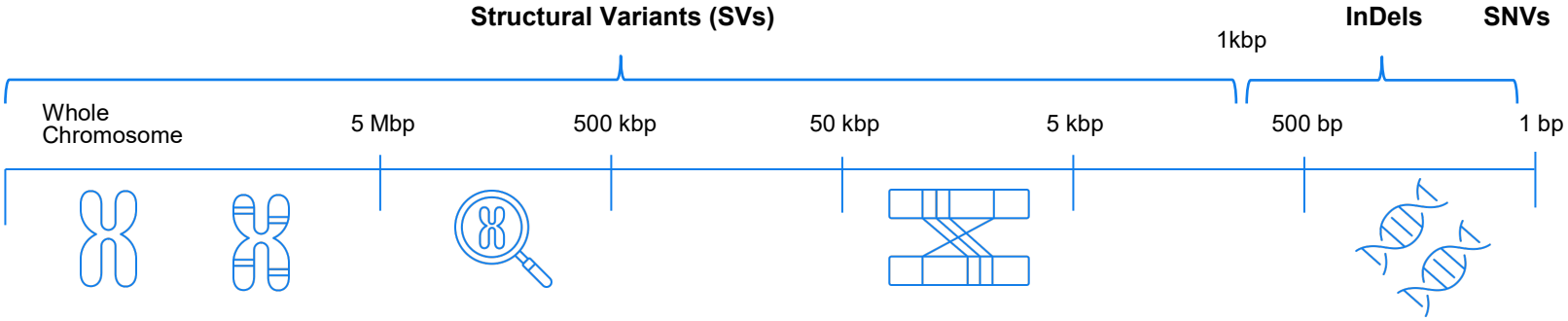
Only 50% of testing is useful for guiding therapy

As many as 20% of prognostic scores for Rx selection may be wrong

86% of cell & gene therapy programs are halted, due partly to limitations in genome analysis tools

Source: L.E.K interviews, research and analysis; Statistical Bulletin on Health Development in China 2021; Department of Woman and Child Health Services of the NHC; management estimates; Cell & Gene Therapy Market - Global Outlook & Forecast 2022-2027 (marketresearch.com); Cell & Gene Therapy Market - Global Outlook & Forecast 2022-2027 (researchandmarkets.com)

OGM detects all classes of SVs in one assay, replacing classical cytogenetics, and bridges the gap to sequencing



Medical Society Recommendations

Cytogenetics | **Sequencing**

National Comprehensive Cancer Network®

Cancer

World Health Organization

Karyotyping | **FISH (targeted)**

Coverage Gap

SVs in this size range were mostly undetectable

Short-read

ACMG American College of Medical Genetics and Genomics

Constitutional Genetic Disease

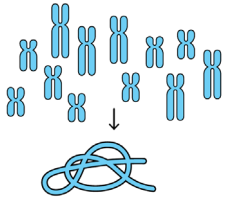
American Academy of Pediatrics DEDICATED TO THE HEALTH OF ALL CHILDREN®

Array (gains and losses only)

Long-read

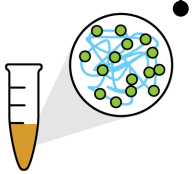
Bionano OGM

OGM uses single molecule imaging of sequence specific patterns on ultra-high molecular weight DNA to reveal SVs

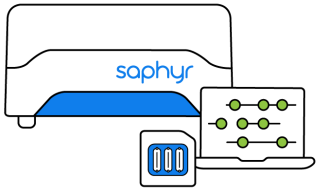


Isolate ultra-high molecular weight (UHMW) DNA

1 Prep

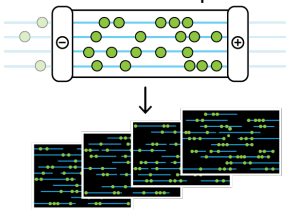


2 Label & Stain specific sequences across the entire genome

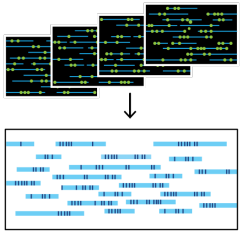


3 Transfer labeled DNA into cartridge for scanning

Image

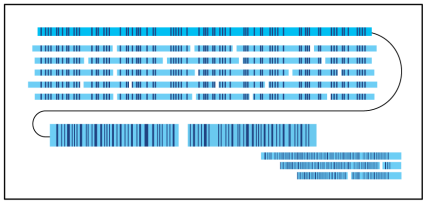


4 Load, linearize, & image labeled and stained DNA in repeated cycles to scan copies of the whole genome

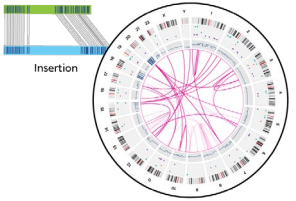


5 Algorithms convert images of molecules into digital maps

Map



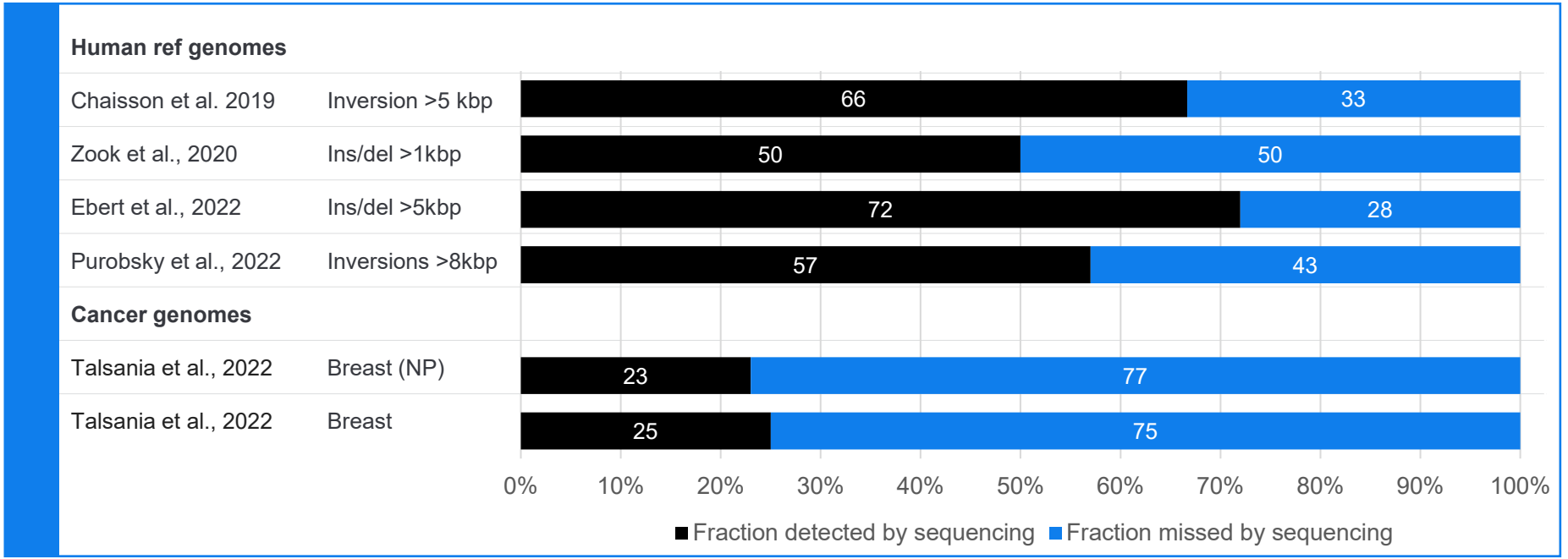
6 Algorithms align molecules to reference maps to construct consensus genome maps



Visualize and curate SVs in the genome browser.

Interpret 7

Published studies consistently show that OGM outperforms long-read sequencing for detection of structural variations



Chaisson, et al. *Nat Commun.* 2019;10(1):1784., Zook, et al. *Nat Biotechnol.* 2020;38(11):1347-1355; Ebert, et al. Science. 2021;372(6537). Porubsky, et al. Cell. 2022;185(11):1986-2005.e26. Talsania, et al. Genome Biol. 2022;23(1):255.

Bionano provides an end-to-end solution for comprehensive structural variant detection with OGM

End -to- End Solution

- Sample-to-interpreted report in as few as 3 days for up to 10,000 samples per year per instrument
- VIA™ software integrates OGM data for all classes of SVs together with NGS and array data in a single view
- Computation solutions developed in collaboration with NVIDIA
- Bionano sells and supports all components of the workflow

Strategy Update:
Our Plan to Succeed

bionano™

Strategic pillars underpinning the transformed Bionano

Enable adoption of **VIA™ software** for more OGM utilization at routine use sites

Leverage existing customer base to increase utilization and drive **menu expansion**

Improve efficiencies across the organization by leveraging beach head into current customers

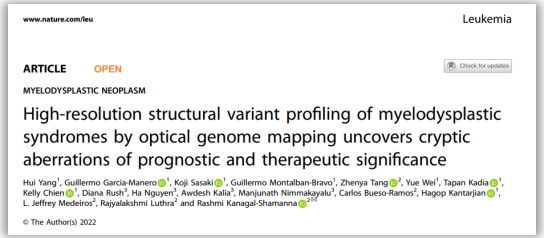
Reduce OpEX & Cash needs

Improve **GM profile**: ⬇ COGS through product optimization & ⬆ utilization

Maintain initiatives for OGM **reimbursement**

Key publications show evidence of OGM as a superior alternative to traditional cytogenetic methods & sequencing (NGS or LRS) for SV detection

Heme malignancy


www.nature.com/leu

Leukemia

ARTICLE OPEN

MYELODYSPLASTIC NEOPLASM

High-resolution structural variant profiling of myelodysplastic syndromes by optical genome mapping uncovers cryptic aberrations of prognostic and therapeutic significance

Hui Yang[1], Guillermo Garcia-Manero[1], Koji Sasaki[1], Guillermo Montalban-Bravo[1], Zhenya Tang[2], Yue Wei[1], Tapan Kadia[1], Kelly Chien[1], Diana Rush[3], Ha Nguyen[3], Awdesh Kalia[3], Manjunath Nimmakayalu[3], Carlos Bueso-Ramos[2], Hagop Kantarjian[1], L. Jeffrey Medeiros[2], Rajyalakshmi Luthra[2] and Rashmi Kanagal-Shamanna[2]

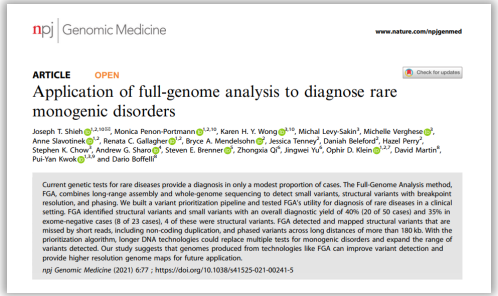
© The Author(s) 2022

THE UNIVERSITY OF TEXAS MD Anderson Cancer Center

- OGM prognostic scores were different for **17 to 21%** of study subjects
- OGM revealed additional pathogenic variants in **13%** of study subjects

https://www.nature.com/articles/s41375-022-01652-8#Abs1

Constitutional


npj Genomic Medicine

www.nature.com/npjgenmed

ARTICLE OPEN

Application of full-genome analysis to diagnose rare monogenic disorders

Joseph T. Shieh[1,2,10✉], Monica Penon-Portmann[1,3,10], Karen H. Y. Wong[1,10], Michal Levy-Sakin[1], Michelle Verghese[1], Anne Slavotinek[1,2], Renata C. Gallagher[1,4], Bryce A. Mendelsohn[1], Jessica Tenney[1], Daniah Beleford[1], Hazel Perry[1], Stephen K. Chow[1], Andrew G. Sharo[1], Steven E. Brenner[1], Zhongxia Qi[5], Jingwei Yu[5], Ophir D. Klein[1,2,7], David Martin[8], Pui-Yan Kwok[1,3,9] and Dario Boffelli[8]

Current genetic tests for rare diseases provide a diagnosis in only a modest proportion of cases. The Full-Genome Analysis method, FGA, combines long-range assembly and whole-genome sequencing to detect small variants, structural variants with breakpoint resolution, and phasing. We built a variant prioritization pipeline and tested FGA's utility for diagnosis of rare diseases in a clinical setting. FGA identified structural variants and small variants with an overall diagnostic yield of 40% (20 of 50 cases) and 35% in exome-negative cases (8 of 23 cases). 4 of these were structural variants. FGA detected and mapped structural variants that are missed by short reads, including non-coding duplication, and phased variants across long distances of more than 180 kb. With the prioritization algorithm, longer DNA technologies could replace multiple tests for monogenic disorders and expand the range of variants detected. Our study suggests that genomes produced from technologies like FGA can improve variant detection and provide higher resolution genome maps for future application.

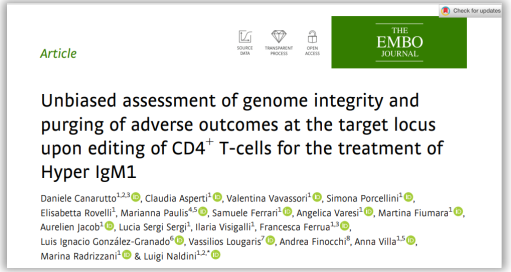
npj Genomic Medicine (2021) 6:77 ; https://doi.org/10.1038/s41525-021-00241-5

UCSF

- OGM findings resolved genetic diseases that were previously undiagnosed
- OGM resulted in incremental **increase in diagnostic yield of 12%** in rare disease cohort

https://www.nature.com/articles/s41525-021-00241-5

Gene therapy


Article

THE EMBO JOURNAL

Unbiased assessment of genome integrity and purging of adverse outcomes at the target locus upon editing of CD4^{+} T-cells for the treatment of Hyper IgM1

Daniele Canarutto[1,2,3], Claudia Asperti[1], Valentina Vavassori[1], Simona Porcellini[1], Elisabetta Rovelli[1], Marianna Paulis[4,5], Samuele Ferrari[1], Angelica Varesi[1], Martina Fiumara[1], Aurelien Jacob[1], Lucia Sergi Sergi[1], Ilaria Visigalli[1], Francesca Ferrua[1,3], Luis Ignacio González-Granado[6], Vassilios Lougaris[7], Andrea Finocchi[8], Anna Villa[1,5], Marina Radrizzani[1] & Luigi Naldini[1,2,*]

SR-Tiget — San Raffaele Telethon Institute for Gene Therapy

- OGM detected **11 nonrecurring SVs** outside of the target locus
- OGM analysis showed that **20-50%** of the edited cells expressing the rescued gene did not undergo precise editing

https://www.embopress.org/doi/epdf/10.15252/embj.2023114188

Strategic assemblance of end-to-end OGM workflow

Q1’ 2017
Commercial launch of Saphyr ® system

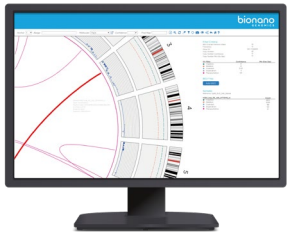
Q4’ 2021
Acquires BioDiscovery software solution NxClinical™ for genome-wide variant analysis from NGS and microarray data types

Q1’ 2024
Full commercial launch of Stratys™ system, which offers high throughput capabilities for new clinical and translational research applications

Q1’ 2018
Introduces DLS chemistry, method for improving its single-molecule optical genome maps

Q4’ 2022
Acquires Purigen Biosystems - automated nucleic acid extraction and purification solutions using proprietary isotachophoresis (ITP) technology on the Ionic® system; OGM kit anticipated second half 2024

Q2’ 2023
Launch of VIA™ software, a new platform for visualization, interpretation and reporting across OGM, microarray and NGS data types. Version with expanded capabilities released in May 2024

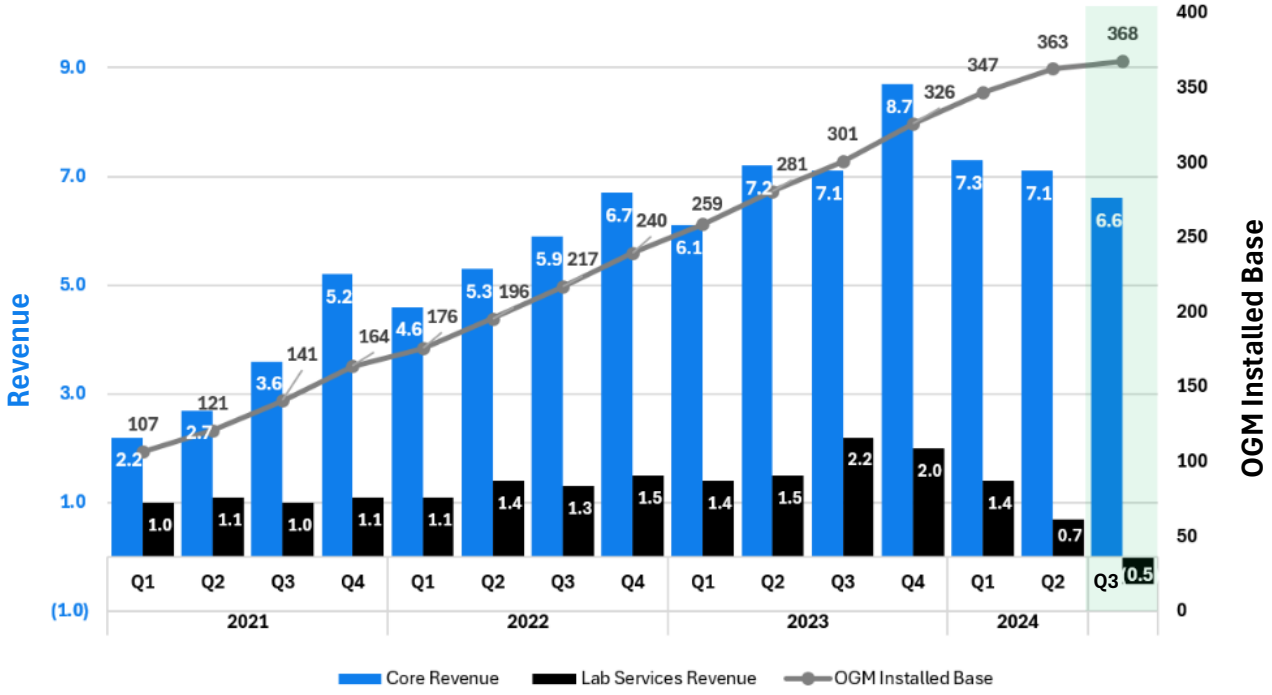


bionano

Financial Review

bionano™

Financial highlights as of September 30th, 2024



- **Q3 revenues: $6.1M (-35% vs Q3'23)**
  - $6.6M core product & software sales offset by a $0.5M write-down of aged receivables
- **GAAP gross margin of (139)%; non-GAAP gross margin 26%**
- **GAAP OpEx $35.5M; non-GAAP OpEx $16.1M**
- **Q3 OGM installed base: 368 (+22% vs Q3'23)**
- **Q3 flowcells sold: 7,835 (+27% vs Q3'23)**

$23.4M* Cash, Cash Equivalents, and Available-for-Sale Securities at End Q3 2024

*$11.4M subject to certain restrictions

Important steps to help us deliver against our vision

Equity Financings

- ✓ Registered direct offering in April 2024, with gross proceeds of ~$10M
- ✓ Registered direct offering in July 2024, with gross proceeds of ~$10M
- ✓ Registered direct offering in October 2024, with gross proceeds of ~$3M
- ✓ Since end of 3Q ATM $1.2M

Projected Cost Savings

- ✓ $100M projected cumulative annual operating expense reduction by Q1 2025, compared to Q1 2023

A highly disciplined approach will position company for future streamlined growth

Significant milestone for OGM with establishment of Category I CPT code for OGM in hematological malignancy analysis

- **Editorial panel of the American Medical Association (AMA) established a new Category I Current Procedural Terminology (CPT) code for the use of OGM** in cytogenomic genome-wide analysis to detect structural and copy number variations related to hematological malignancies
- **CPT code is a key component in obtaining reimbursement** for the Bionano Laboratories OGM-Dx™ HemeOne laboratory developed test from third party payors

American Medical Association (AMA) CPT Code for OGM	
Code #	88XX0
Final Code #	TBD
Code Type	NEW
Category	Molecular Pathology; Optical Genome Mapping
Long Code Descriptor	Cytogenomic genome-wide analysis, hematologic malignancy, structural variations and copy number variations, optical genome mapping (OGM)

Bionano is focused on accelerating revenue growth, operating efficiently, and raising capital that will allow us to extend our cash runway

Streamlined Business Focus

- Adoption of VIA™ software driving OGM utilization across clinical sites
- Leverage existing customer / install base to increase utilization and drive menu expansion
- Maintain initiatives for OGM reimbursement
- Improve GM profile: COGS & sample pull through

2024 Guidance

OGM FY'24 Total Revenue Guidance:
$28 – $30M

OGM Installed Base YE'24:
370 – 380 systems

4Q'24 Revenue Guidance:
$6.0 – $7.0M

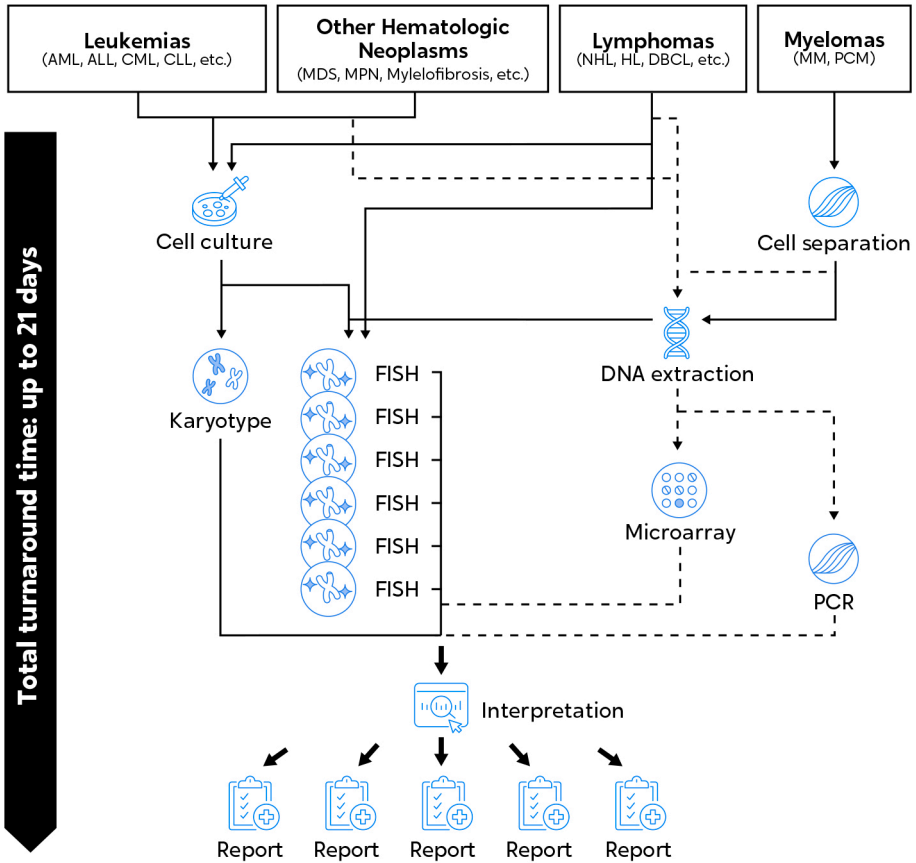
Thank you.

bionano™

Primary Appendix

bionano™

Traditional Cytogenetic Lab Workflow



Vs.

The OGM Workflow

Leukemias
(AML, ALL, CML, CLL, etc.)
Other Hematologic Neoplasms
(MDS, MPN, Mylelofibrosis, etc.)
Lymphomas
(NHL, HL, DBCL, etc.)
Myelomas
(MM, PCM)

Total processing time: 3-5 days

- Isolation and labeling
- DNA imaging
- Analysis and reporting

DNA molecules linearization and imaging in the Saphyr® Instrument

From raw data to final report, through Bionano Solve™, Access™, and VIA™ Software

OGM Has a Unique Position in the Genomics Market

NGS Landscape

illumina
Solexa

ULTIMA GENOMICS
UG 100

Element Biosciences
AVITI

PacBio
Onso

SINGULAR GENOMICS
G4

illumina
Novaseq

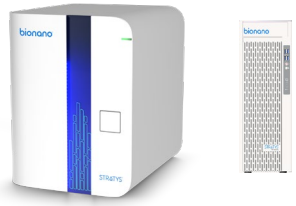
LRS Landscape

Oxford NANOPORE Technologies
PromethION 24

Revio

OGM Landscape

Saphyr system



Stratys system

bionano

Clinical Trial Sites and PIs Influence Guidelines and Reimbursement

Brynn Levy, PhD
Columbia

Board ISPD, Co-Editor Prenatal Diagnosis, CGC Founding Member

Aaron Bossler, MD, PhD
University of Iowa

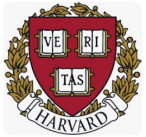
AMA CPT Editorial Committee Member

Rashmi Kanagal-Shamanna
MD Anderson

AMP BOD, CGC BOD, NCCN Liaison

Ravindra Kolhe, MD, PhD
Augusta University

US and Canadian CAP, AACR/ASCO visibility, NCI match PI, TSO500 driver for Illumina



Adrian Dubuc, PhD
Harvard

Former CGC president, and Harvard

Barb Dupont, PhD,
Greenwood Genetic Center

Constitutional (Agilent validation, Affy validation , Illumina FDA sequencing validation consortium)

Jim Broach, PhD
Penn State Medical College

Track record of success with Bionano technology

Gordana Raca, PhD
CHLA

CGC President, NCCN Liaison
ACMG Technical Standards

Saurabh Gupta, PhD
Quest – Med Fusion

Quest, high volume

Anwar Iqbal, PhD
University of Rochester

CGC Founder, NY state

Yassmine Akkari, PhD
Nationwide Childrens

AMCG lab QA, AMP training and ed chair, CGC President

Ulrich Broeckel, MD
Medical College of Wisconsin

NIH initiatives on clinical pharmacogenomics

Stephen C. Peiper, MD
Chairman & Senior Vice President of Enterprise Pathology

Roger Stevenson, MD
Founder of Greenwood Genetic Center

World renowned geneticist

Aleksandar Rajkovic, PhD, MD
UCSF Chief Genomics Officer

Stuart Lindsay Distinguished Professor in Experimental Pathology

Teresa Smolarek, PhD
Cincinnati Children's Hospital

Director, Genetics and Genomics Diagnostic Laboratory

Peter Bui, PhD, FACMG
Quest Diagnostics

National Chief Director, Cytogenetics

James S Blachly, MD
Comprehensive Cancer Center OSU

National Comprehensive Cancer Network

Recent Publications from Our Clinical Trials Span our Target Markets

		Genetic Disease			Cancer				
REFERENCE	COHORT SIZE	FSHD	Prenatal	Postnatal	AML/CML//MPN/MDS	ALL/CLL	Lymphoma	MM/PCM	Solid Tumor
University of Iowa Stence, et al., 2021	351	●							
University of Augusta Sahajpal, et al., 2023	114		●						
Ningbo Women & Children Xie, et al., 2024	204		●						
Multisite trial Iqbal, et al., 2023	404			●					
Multisite trial Broeckel, et al., 2024	597			●					
Radboud University Neveling et al., 2021	52				●	●		●	
Multi-site Pang et al. 2022	80				●	●	●	●	
Augusta, Emory Sahajpal et al. 2022	69				●		●	●	
M.D. Anderson Yang et al., 2022	101				●				
Cancer Genomics Consortium Levy et al., 2022	100				●				
Hannover Medical School Lühmann et al., 2023	142					●			
Penn State Med Goldrich et al., 2021	20								●

● Peer-reviewed