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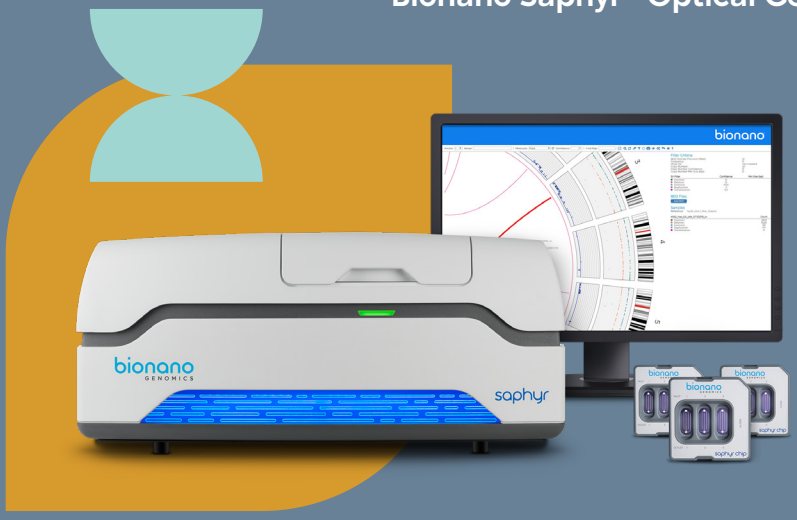
Redefine Cell Line QC with Optical Genome Mapping

Characterizing cell line genomic integrity and editing events is of critical importance to R&D and QC/CMC teams working in cell and gene therapy programs.

Traditional cytogenetic and NGS methods have significant limitations in variant class coverage, resolution, turnaround time and scalability. This necessitates using a constellation of these methods to characterize and monitor genomic integrity and gene-editing events (off- and on-target) which can be complicated, time-consuming, and expensive.

Bionano Saphyr® Optical Genome Mapping system



The Bionano Saphyr® Optical Genome Mapping system delivers game-changing high performance and comprehensive variant class coverage with an unbiased, genome-wide approach and digital readout — without revealing proprietary sequence data.

Move Your Program Forward with Optical Genome Mapping

	OGM	Karyotype	ddPCR	Microarray	NGS Panel
Genome-wide, Unbiased Detection	✓	✓	✗	✓	✓
High Resolution	✓	✗	✓	✓	✓
Variant Class Coverage	✓	✓	✗	✓	✓
Limit of Detection (VAF%)	✓	✓	✓	✗	✓
Time-to-Result	✓	✗	✓	✓	✓
Sample-to-Answer Workflow	✓	✗	✓	✓	✗
Automated Variant Calling	✓	✗	✓	✓	✓
Cost	✓	✓	✓	✓	✗

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Move Forward with Us

Several early adoption sites, including both academic research foundations and commercial biotechnology organizations, have shared their experiences with OGM across a variety of applications

Organization	Application	Methods	Findings
CiRA Foundation (Japan)[1]	Evaluating the effects of CRISPR-Cas9 gene editing	Performed a stringent genomic integrity assessment of CRISPR-Cas9 edited iPSC subclones, using WGS, karyotyping and OGM	OGM uniquely identified unexpected chromosomal translocations and inversions introduced by gene editing
Oklahoma Medical Research Foundation (USA)[2]	Evaluating the effects of prolonged cell culture on induced pluripotent stem cells (iPSCs)	Measured the effects of cell culturing in two iPSC lines in parallel for 50 passages and examined them at multiple time points using OGM	OGM identified substantial changes in the iPSC line genomes, including deletions, insertions, balanced translocations and inversions
Verve Therapeutics (USA)[3]	Evaluating genomic integrity after CRISPER-Cas genome engineering in a primary liver cell line used in drug development	Assessed for chromosomal rearrangements and large insertions or deletions in a liver cell line treated with a single course gene editing drug in development	They showed that no additional SVs accumulated after treatment when compared with untreated controls
bit.bio (UK)[4]	Cytogenetic quality control of iPSCs	Assessed the cytogenetic health of iPSC banks at commercial scale	They adopted OGM in-house as a single workflow solution, replacing an outsourced two-assay process, reducing TAT from 5 weeks to 1 week and improving the quality of SV data

See How OGM Can Support Your Cell QC Needs

The Bionano Saphyr® system is available through either a rental agreement or purchase. Installation, training, software, and support are included.

Tell us about you project at **bionano.com/contact-us** and our team will reach out to you.

"We were immediately impressed by the quality of data produced by Saphyr. It also reduced costs per sample and turnaround time from 5 weeks to under 1 week. We've gained unprecedented clarity as to the genetic health of our cell lines."

Arran Constantine | Scientist MSAT, bit.bio

Commenting on adoption of OGM in-house for quality control of iPSCs

References: 1. *Kitano et al.* Mol Ther Methods Clin Dev. 2022;26:15-25. doi: https://doi.org/10.1016/j.omtm.2022.05.010 2. Dubose *et al. Genes*. 2022; 13(7):1157. doi: https://www.mdpi.com/2073-4425/13/7/1157 3. Verve Therapeutics press release. April 26, 2022. https://ir.vervetx.com/news-releases/news-release-details/verve-therapeutics-presents-comprehensive-analyses-target 4. Bit.bio website. May 5, 2022. https://www.bit.bio/blog/how-our-culture-enables-new-technologies

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