GeneStrat NGS Executive Summary

Biodesix is a leading data-driven diagnostic solutions company with a focus in lung disease. The Company develops and offers non-invasive diagnostic tests that address important clinical questions for patients with diseases of the lung. One significant problem currently faced by healthcare providers and their patients is ensuring that patients diagnosed with cancer, and especially advanced cancer, receive the correct therapy expeditiously and, when possible, using less invasive means. Next Generation Sequencing (NGS) testing has emerged in the oncology space as a solution to this problem with proven clinical utility to drive appropriate treatment and improved health outcomes.[i] However, turnaround time for test results and therefore time to treatment remains an issue in NGS testing in oncology, as most available tests can require as many as 14 days from specimen collection for results.[ii,iii]

Biodesix has developed an analytically and clinically validated blood-based NGS genomic assay called the GeneStrat NGS genomic test to address this turnaround time issue for patients diagnosed with advanced cancer with results in 72-hours. The GeneStrat NGS genomic test, assigned Z-Code Z00W6, is a qualitative laboratory developed test (LDT) performed in the Biodesix laboratory located in Boulder, Colorado (NPI 1538559919). Designed to provide targeted, actionable mutation information to physicians treating patients with advanced/metastatic cancer, the GeneStrat NGS genomic test uses targeted high-throughput, parallel-sequencing technology to enable reproducible detection and analysis of circulating tumor DNA and RNA across all major classes of somatic mutations (SNVs, indels, CNVs, fusions and exon skipping) from whole blood.

The GeneStrat NGS genomic test targets 52 genes (containing a number of variants of therapeutic interest) across multiple cancer types, including lung, colorectal, breast, pancreatic, thyroid and others. The majority of these genes and variants of interest are already covered by Novitas for Medicare beneficiaries under the existing Local Coverage Determination L35396 *Biomarkers for Oncology*.[iv] The ThermoFisher NGS technology on which the GeneStrat NGS genomic test was built has broad application for liquid biopsy clinical use and currently has positive Medicare coverage from Novitas for testing of tissue specimens.[i] Established clinical guidelines recommend that testing of lung cancer specimens for specific gene alterations that impact therapy selection is important for selection of efficacious targeted therapies or avoidance of therapies that may not provide clinical benefit.[v] The results of the GeneStrat NGS assay provide relevant, actionable mutation information to physicians treating patients with cancer in the shortest timeframe currently available on the market. The intended population for GeneStrat NGS includes patients diagnosed with either recurrent, relapsed, refractory, metastatic, or advanced stage III or IV cancer who have not been previously tested with the same test using NGS for the same cancer content, and who have decided to seek further cancer treatment.

GeneStrat NGS Key Points:

I. **GeneStrat NGS is a non-invasive liquid biopsy assay measuring 52 genes.**
   - Requires minimal plasma to render results, a critically important factor for patients diagnosed with advanced cancer.

II. **Test results are available within 72 hours of receipt of the sample in the Biodesix laboratory.**
   - Unprecedented 3-day turnaround time for results for clinicians and their patients.

III. **All samples received and tests performed in a highly regulated CLIA certified clinical laboratory.**
   - Biodesix actively maintains a high-complexity CLIA certified, CAP accredited, NYS CLEP approved and ISO 13485 certified clinical laboratory.

[i] National Coverage Determination (NCD) 90.2 for Next Generation Sequencing (NGS) Accessed on 19APR2021. https://www.cms.gov/medicare-coverage-database/details/ncd-details.aspx?ncdid=372&KeyWord=Next%20generation&KeyWordLookUp=Title&KeyWordSearchType=Exact&bc=CAAAAAAAAAAA

[ii] Bowling M, et al. J Clin Oncol 36, 2018 (suppl; abstr e18519)

[iii] Lee Y, Clark EW, Milan MSD, Champagne C, Michael KS, Awad MM, Barbie DA, Cheng ML, Kehl KL, Marcoux JP, Rabin MS, Rotow JK, Sands JM, Jänne PA, Oxnard GR. Turnaround Time of Plasma Next-Generation Sequencing in Thoracic Oncology Patients: A Quality Improvement Analysis. JCO Precis Oncol. 2020 Sep 21;4:PO.20.00121. doi: 10.1200/PO.20.00121. PMID: 33015530; PMCID: PMC7529535.

[iv] Local Coverage Determination (LCD) Biomarkers for Oncology L35396. Available from https://www.cms.gov/medicare-coverage-database/details/lcd-details.aspx?LCDId=35396. Accessed 30 July 2021.

[v] Thompson J., et al. J Clin Oncol 36, 2018 (suppl; abstr e18519).