News Release

Puma Biotechnology Announces Presentation of Biomarker Findings from a Phase II Study of Alisertib with Paclitaxel versus Paclitaxel Alone in Metastatic or Locally Recurrent Breast Cancer at the 2023 ASCO Annual Meeting

LOS ANGELES, Calif., June 4, 2023 – Puma Biotechnology, Inc. (NASDAQ: PBYI), a biopharmaceutical company, announced the presentation of biomarker findings from a Phase II study of alisertib plus paclitaxel versus paclitaxel alone (Clinicatrials.gov identifier NCT02187991) in metastatic hormone receptor positive (HR+) and triple negative (TN) breast cancer at the 2023 American Society of Clinical Oncology (ASCO) Annual Meeting held June 2-6 in Chicago and online. The Phase II trial was conducted through The US Oncology Network. The results of this trial were published by Joyce O'Shaughnessy et al. (*Jama Network Open*, April 2021) and showed that the addition of alisertib to paclitaxel improved progression-free survival (PFS) among enrolled patients compared with paclitaxel alone (HR, 0.56; 95%CI, 0.37-0.84; P = .005).

The poster (Abstract #1037, poster #258), entitled, "Association of C-MYC, MYC target gene, and unfolded protein response (UPR) expression with clinical benefit from the oral aurora kinase A (AURKA) inhibitor, alisertib (A), in combination with paclitaxel (P) compared with P alone in patients (Pts) with HER2-negative metastatic breast cancer (MBC)," was presented at the Breast Cancer – Metastatic Poster Session by Sara A. Byron, Ph.D., Integrated Cancer Genomics Division, Translational Genomics Research Institute (TGen), part of City of Hope, on June 4 at 8:00 a.m. CDT. A copy of the poster is available on the Puma Biotechnology website.

Archival tissue samples from patients enrolled in the clinical study were analyzed at TGen. Of the 140 patients enrolled in the trial, 45 from the alisertib plus paclitaxel arm and 51 from the paclitaxel arm had sufficient tissue available for next generation sequencing, and 31 from the alisertib plus paclitaxel arm and 35 from the paclitaxel arm had enough for RNA sequencing/gene set enrichment analysis. The most frequently mutated genes were *PIK3CA* (45%) and *TP53* (44%). No mutations were significantly associated with response or resistance to alisertib plus paclitaxel, including those in *PIK3CA, TP53, AKT1*, *HER2,* and *CDH1*.

Increased MYC RNA expression was observed in tumors from patients who did not derive clinical benefit from paclitaxel alone (defined as PFS less than 6 months) compared to those with benefit from paclitaxel alone (defined as PFS greater than or equal to 6 months). Increased MYC RNA expression was not observed in patients who did not appear to benefit from alisertib plus paclitaxel. Elevated expression of genes involved in MYC activation and in unfolded protein response (a pro-survival mechanism) were enriched in alisertib plus paclitaxel responders compared to paclitaxel responders and were associated with poor response to paclitaxel alone. In 12 patients with exceptional response to alisertib plus paclitaxel (defined as PFS greater than or equal to 12 months), increased expression of genes involved in MYC activation and in epithelial to mesenchymal transition (a hallmark of cancer progression and metastasis) was observed in comparison to cancers from patients whose disease

progressed within 6 months of initiating alisertib + paclitaxel (n=11) or those with exceptional response to paclitaxel alone (n=4).

"There continues to be a need for new drugs for the treatment of metastatic ER-positive, HER2-negative breast cancer and triple negative breast cancer," said Joyce A. O'Shaughnessy, M.D., the Celebrating Women Chair in Breast Cancer Research at Baylor University Medical Center, Texas Oncology, and Chair of Breast Cancer Research for the US Oncology Network in Dallas, Texas. "The results of this study and the subsequent biomarker analysis demonstrate that the addition of alisertib to paclitaxel may help to identify which patients are likely to derive the most benefit from alisertib and helps to identify biomarker focused populations that can be studied in future clinical trials of alisertib."

Sara Byron, Ph.D., Research Associate Professor in the Integrated Cancer Genomics Division at TGen, added, "We are pleased to have collaborated with Dr. O' Shaughnessy on evaluating the effect of alisertib in this breast cancer trial. The biomarkers that were associated with clinical benefit to alisertib appeared to be the ones associated with an aurora kinase A inhibitor like alisertib, and we are hopeful that this work will help identify future patient populations that may benefit from alisertib."

Alan H. Auerbach, Chief Executive Officer and President of Puma Biotechnology, said, "We are very pleased with the results of this biomarker analysis. We are committed to and focused on the development of alisertib in biomarker defined populations who may derive the greatest benefit from treatment with alisertib. This biomarker analysis will be very helpful to the design of the future trials of alisertib that we are planning in hormone receptor positive HER2-negative breast cancer."

About Puma Biotechnology

Puma Biotechnology, Inc. is a biopharmaceutical company with a focus on the development and commercialization of innovative products to enhance cancer care. Puma in-licensed the global development and commercialization rights to PB272 (neratinib, oral), PB272 (neratinib, intravenous) and PB357. Neratinib, oral was approved by the U.S. Food and Drug Administration in 2017 for the extended adjuvant treatment of adult patients with early stage HER2-overexpressed/amplified breast cancer, following adjuvant trastuzumab-based therapy, and is marketed in the United States as NERLYNX® (neratinib) tablets. In February 2020, NERLYNX was also approved by the FDA in combination with capecitabine for the treatment of adult patients with advanced or metastatic HER2-positive breast cancer who have received two or more prior anti-HER2-based regimens in the metastatic setting. NERLYNX was granted marketing authorization by the European Commission in 2018 for the extended adjuvant treatment of adult patients with early stage hormone receptor-positive HER2-overexpressed/amplified breast cancer and who are less than one year from completion of prior adjuvant trastuzumab-based therapy. NERLYNX is a registered trademark of Puma Biotechnology, Inc.

In September 2022, Puma entered into an exclusive license agreement for the development and commercialization of the anti-cancer drug alisertib, a selective, small molecule, orally administered inhibitor of aurora kinase A. Initially, Puma intends to focus the development of alisertib on the treatment of small cell lung cancer and breast cancer.

Further information about Puma Biotechnology may be found at https://www.pumabiotechnology.com.

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