May 10, 2011

Biocept, Inc. Announces Peer Reviewed Article in Journal of Oncology

Biocept Demonstrates Multiple Phenotypes of Circulating Tumor Cells (CTCs) in Cancer Patients

San Diego, California: ? Biocept, Inc., a privately?held laboratory testing company focused on the detection, enumeration and analysis of circulating tumor cells (CTCs) in cancer patients, today announced the publication of a paper describing the identification of different CTC phenotypes using its proprietary Cell Enrichment and Extraction (CEETM) platform. The paper, appearing in the Journal of Oncology and entitled “Detection of EPCAM?Negative and Cytokeratin?Negative CTCs in Peripheral Blood”, supports a growing belief that there are many cancer patients with CTCs that don’t meet the standard criteria by which a CTC is defined and, importantly, detected in current practice. The Biocept technology platform may allow more sensitive and comprehensive CTC tests for cancer patients.

David Hale, Executive Chairman of Biocept, said “We are very excited with these results, as they support the potential of Biocept’s CEETM platform, not only to provide more sensitivity than current methods and detect more CTCs from the same blood sample, but also to derive more information about, and offer new insights into, a patient’s cancer”. He continued, “We are very optimistic that better treatment decisions, and, ultimately, better patient outcomes, will result”.

CTCs are very rare in the blood of cancer patients, ranging from 1 to over a thousand in a standard 10 ml blood sample, which may contain 50?100 billion normal red or white blood cells. To be able to count or analyze CTCs, an enrichment process is necessary. Enrichment from blood is typically achieved using antibodies to EpCAM (Epithelial Cell Adhesion Molecule), a protein found on the surface of epithelial cells that enables them to bind to each other and to the extracellular matrix. CTCs are normally detected after capture using antibodies to cytokeratin (CK), an intracellular structural protein typically found in epithelial cells. However, EpCAM and CK are not expressed in all tumor cells of epithelial origin, nor in many other tumor types such as sarcomas and malignant melanomas. EpCAM and CK can also be down?regulated or absent in tumor cells undergoing the epithelial?to?mesenchymal (EMT) transition, a process by which tumor cells become less rigid and more pliable, presumably facilitating their migration into blood vessels and capillaries to establish metastases.

With the CEETM platform Biocept’s scientists used an antibody mixture, or cocktail, in addition to an anti?EpCAM antibody, for CTC capture. These antibodies were directed to a range of cell surface antigens, some more typically seen on epithelial–type cells, and others on mesenchymal?type cells. They also used CEE?EnhancedTM staining (CEE?E) for CTC detection, which is a unique in situ staining method that fluorescently labels the capture antibodies bound to CTCs. This enables the detection of all specifically captured CTCs, including those that are CK?negative. Biocept scientists evaluated blood samples from 24 stage IV metastatic breast cancer patients, and demonstrated that after capture with the antibody cocktail, 15 of 24 (63%; range 1?60 CTCs) stained positively with anti?CK antibodies, and all 24 were positive for additional CK?negative, CEE?E positive CTCs (100%; range 1?41; median=11). HER2 FISH was performed on the captured cells, and both CK?positive and CK? negative/CEE?E positive cells were found with amplified HER2 genes, confirming them as tumor cells. A key finding from this study is that the peripheral blood of cancer patients contains CTCs different from those captured and detected with standard approaches employing only antibodies to EpCAM and CK, (i.e., CK? negative, CEE?E positive).

Stephen Mikolajczyk, Senior Director of R&D and principal scientist at Biocept and lead author on the paper, commented, “We think it is important for the cancer community to recognize that CTCs are heterogeneous, like the tumors they come from, and focusing on a single CTC sub?population, such as an EpCAM+/CK+ phenotype, excludes cells from analysis that may contain valuable information that is highly relevant for some patients.”