[Back to Basics: How Biomarkers are Used in Oncology Research](http://www.conversantbio.com/blog/back-to-basics-how-biomarkers-are-used-in-oncology-research)

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A biomarker is defined as a quantifiable indicator of a biological, pathological, or therapeutic response process occurring in the human body. It is found in blood, other body fluids and tissues and is particularly helpful for researchers to understand the normal and abnormal processes. Oncology research in particular, focuses on identifying and measuring certain protein and molecular expressions that are associated with neoplasia.

[Advances in proteomics, genomics and molecular pathways](http://www.nature.com/nrc/journal/v5/n11/full/nrc1739.html) have generated many biomarker candidates with potential clinical value. Particularly, applications in the clinical setting, which include:

* Risk Assessment for certain cancers
* Diagnostic markers for oncologic processes (pre-clinical)
* Staging and identifying metastatic disease
* Identifying the aggressiveness or grade of the cancer
* Predicting treatment response based on the biomarker profile
* Identifying pharmacokinetic dosing for specific patients
* Monitoring treatment response

The concept of [personalized cancer medicine](http://www.massgeneral.org/cancer/services/treatmentprograms.aspx?id=1544) is relatively new, and current translational research matches molecularly targeted treatments to specific genetic abnormalities that enable cancer cells in a patient’s tumor to thrive. Even emotional stress has specific measurable associated biomarkers that show a correlation with pathologic processes.

Although stress per se does not cause cancer, the clinical and experimental data indicate that factors such as mood, coping mechanisms and social support can significantly influence the underlying cellular and molecular processes that facilitate malignant cell growth. As cancer treatment evolves towards a more patient-specific approach, consideration of the influence of [bio-behavioural factors](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3146042/)provides a novel perspective for mechanistic studies and new therapeutic targets.

By analyzing human cancer cell lines derived from various tumor types, researchers are able to identify which genetically-defined subgroups within cancers are sensitive to new molecular-targeted therapies, and this in turn informs the selection of patients for subsequent clinical trials investigating the drugs.

Early detection and accurate disease classification are hallmarks for any successful treatment program, and drives the desire for [more effective clinical biomarkers.](http://informahealthcare.com/doi/pdf/10.1586/14789450.2014.899908) With better understanding of cancer biology and rapid development of more advanced proteomics technologies, some of these novel protein-based biomarkers will have considerable potential to translate into routine clinical practice.

Recent research even shows the value of epidemiological studies using biomarkers. As an example, it has long been known that [red meat is associated with increased health issues](http://cebp.aacrjournals.org/content/20/6/1107.abstract?sid=f0ef5218-ca0a-41b5-948b-10cc7584e7e1), including cancer. To identify the potential cancer risk of people who consumed a high meat diet, scientists identified several biomarkers found in urine and found a measurable correlation with meat intake and cancer risk.

The current research into all aspects of cancer is soaring, and there are many clinical trials investigating biomarkers, known and still yet to be known, and the potential for targeting therapies and diagnosis according to the specific patient profile.

Conversant Bio can help you optimize your research by using specific sample inclusion criteria set by you. Gain access to a variety of tissue samples such as breast, lung, colorectal, prostate, melanoma, ovarian, and other solid tumor cancers.

**References:**

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