

Receptor Capture Assay

The receptor capture invention provides a rapid, ultra-sensitive, and economical method for measuring transcription factor ligands (analytes) and for measuring transcription factor activity. The technology is based on amplification of a nucleic acid-tracer that correlates with the presence of the ligand or transcription factor activity.

One embodiment of the invention has recently been commercialized by Eichrom Technologies as a rapid and sensitive assay that measures dioxins and dioxin-like compounds. The assay, called Procept, is based on the quantitative measurement of Aryl Hydrocarbon receptor activation induced by the presence of dioxin in a sample. Procept has been validated as EPA SW-846 Method 4430.

When the detection or measurement of analyte takes place by the method of the present invention, an appropriate transcription factor is contacted in the presence of required reagents or cell factors, with known concentrations of an analyte or analytes of interest, or alternatively, is contacted with an unknown sample that might possibly contain a suspected analyte of interest. The resulting set of analytes is then detected by any of several methods of the invention, in order to correlate concentrations of known and unknown samples of the analyte and to determine the presence of the analyte in a sample (e.g., of soil, food, blood, tissue, etc.).

In another embodiment, the invention could provide a rapid, sensitive, and economical assay for detecting changes in transcription factor activation in an organism exposed to disorders, toxicants, toxins, or infectious agents. Such assays would have utility in detecting changes in transcription activation in an animal or human for any desirable purpose. Detection of these activation events provides for diagnostic capabilities and, due to the same, these assays may be employed to determine if transcription factors isolated from an organism have already been activated by, for example, exposure to dioxins or anthrax.

When the method of the present invention is employed to detect or measure transcription factor activation, tissue believed to contain the transcription factor is treated to obtain the transcription factor in a form sufficiently purified to allow for determination of the activated state by the methods of the invention. This determination may be readily employed to detect disorders or the exposure of an organism (e.g., plant life, wild animals, pets, domestic livestock, and/or humans) to toxicants, toxins, or infectious agents of interest.