Nobel Prize-winning TRACE technology on B·R·A·H·M·S KRYPTOR

The unique measurement principle at the heart of our expertise in highly sensitive and specific diagnostics

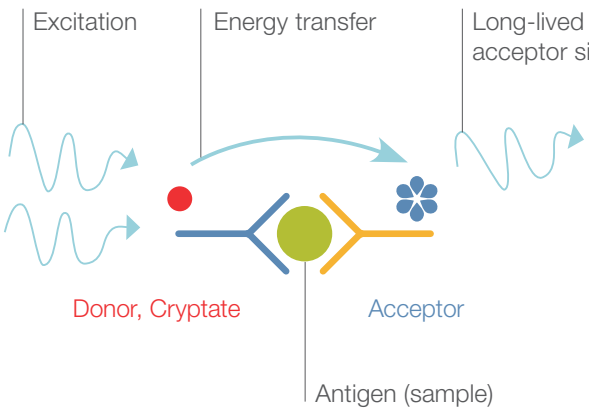
Introduction

B·R·A·H·M·S™ KRYPTOR™ analyzers are fully automated random access immuno analyzers to optimize the daily routine in clinical and research laboratories, particularly in a specialty diagnostics set-up. The measurement principle of B·R·A·H·M·S KRYPTOR analyzers is based on Nobel Prize® winning TRACE™ Technology (Time-Resolved Amplified Cryptate Emission), which measures the signal that is emitted from an immuno-complex with time delay.

TRACE method was based on a fundamental research which won Prof. Jean-Marie Lehn, the Nobel Prize for Chemistry in 1987.

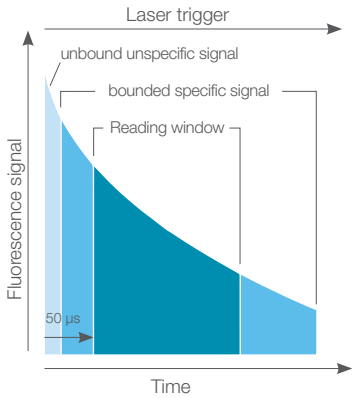
TRACE principle

The basis of the TRACE Technology is non-radiative energy transfer from a donor to an acceptor, which is part of a chemically modified, light-collecting algal protein (e.g. XL 665). The spectral overlap between donor emission and acceptor absorption spectra on the one hand, intensify the fluorescent signal of the cryptate and on the other hand it extend the life span of the acceptor signal, permitting the measurement of temporally delayed fluorescence. TRACE ensures that only signals of interests are measured by excluding unbound and unspecific signals.



Detection technique

When the sample is excited with a nitrogen laser at 337 nm, the donor (e.g. cryptate) emits a long-life fluorescent signal in the millisecond range (e.g. at 620 nm), while the acceptor (e.g. XL 665) generates a short-life signal in the nanosecond-range (e.g. at 650 nm). When the two components are bound in an immunocomplex, both the signal amplification and the prolongation of the life span of the acceptor signal occur at 665 nm, so that it can be measured over microseconds. Signal detection is delayed by 50 µs to isolate the long signal emitted by immuno complex from short signals of unbound fluorophores. This long-lived signal which is proportional to the concentration of the analyte of interest is measured by selecting the spectral and temporal information. Spectral information is collected by separating the wavelength at 665 nm. Temporal information is collected by time resolved measurement which is set to 50 µs on B·R·A·H·M·S KRYPTOR.



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Reliable prevention of interference

Non-specific signals, e.g. the signals of the short-life and unbound acceptor (e.g. XL 665) and the medium-specific interference signals conditional upon the natural fluorescence of the sample, are eliminated by temporal delay of the fluorescence measurement. The signal generated by the cryptate (e.g. at 620 nm) serves as an internal reference and is measured simultaneously with the long-life acceptor signal (e.g. at 665 nm) which is the specific signal. Interfering influences, e.g. from turbid sera, are automatically corrected by means of the internally calculated ratio of the intensities at these wavelengths.

Benefits of TRACE

- No wash and separation steps
- High-sensitivity is not affected by deviations in color or by turbidity
- High precision and reliability
- Optimized workflow
- Unbound/unspecific signals are not detected and therefore not interfering with the result
- B·R·A·H·M·S KRYPTOR technology has proven to ensure highest precision and reproducibility

Clinical Diagnostics

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