

Direct Detection of Active Monomeric Prolactin

B·R·A·H·M·S Prolactin KRYPTOR –
Revealing Macroprolactin Interference

Physiological role of Prolactin

The pituitary hormone prolactin (PRL) plays an important role in lactation following pregnancy and in several other biological processes such as immunoregulation or angiogenesis.¹ Prolactin can be found in 3 different forms in a patient's serum²: the monomeric prolactin (mPRL), a dimeric form usually referred to as "big prolactin" (bPRL), and a large complexed form termed macroprolactin or "big big prolactin" (bbPRL). Of these 3 forms only mPRL is physiologically active (figure 1).

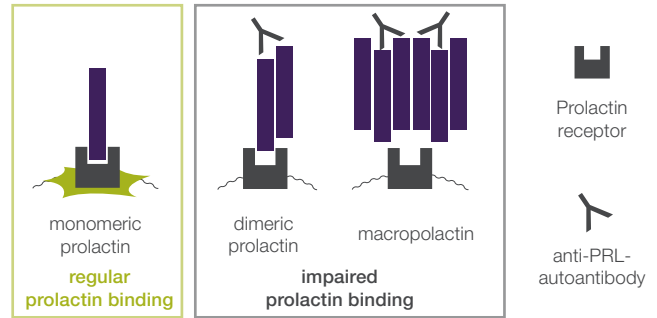


Figure 1 Different isoforms of prolactin and their physiological activity. ^{modified 4}

Revealing Macroprolactin interference

A hyperprolactinemia is defined as a high level of active monomeric prolactin (mPRL). There are several pathological reasons for hyperprolactinemia such as pituitary adenomas, hypothalamic and pituitary diseases, chest wall diseases, hypothyroidism and hepatorenal disorders.³ An increased level of macroprolactin (macroprolactinemia) is clinically not relevant.^{4,5} Distinguishing between prolactin and macroprolactin is necessary to avoid misinterpretation of results.

In order to provide reliable results most available methods for prolactin detection require additional investigations.⁶

Thermo Scientific™ B·R·A·H·M·S™ Prolactin KRYPTOR™ shows minimal macroprolactin interference and therefore offers a valuable tool for identification of hyperprolactinemia (figure 2).^{7,8}

Thermo Scientific B·R·A·H·M·S Prolactin KRYPTOR can be used either for direct measurement of monomeric prolactin or as a confirmation for initial determination obtained on another instrument.

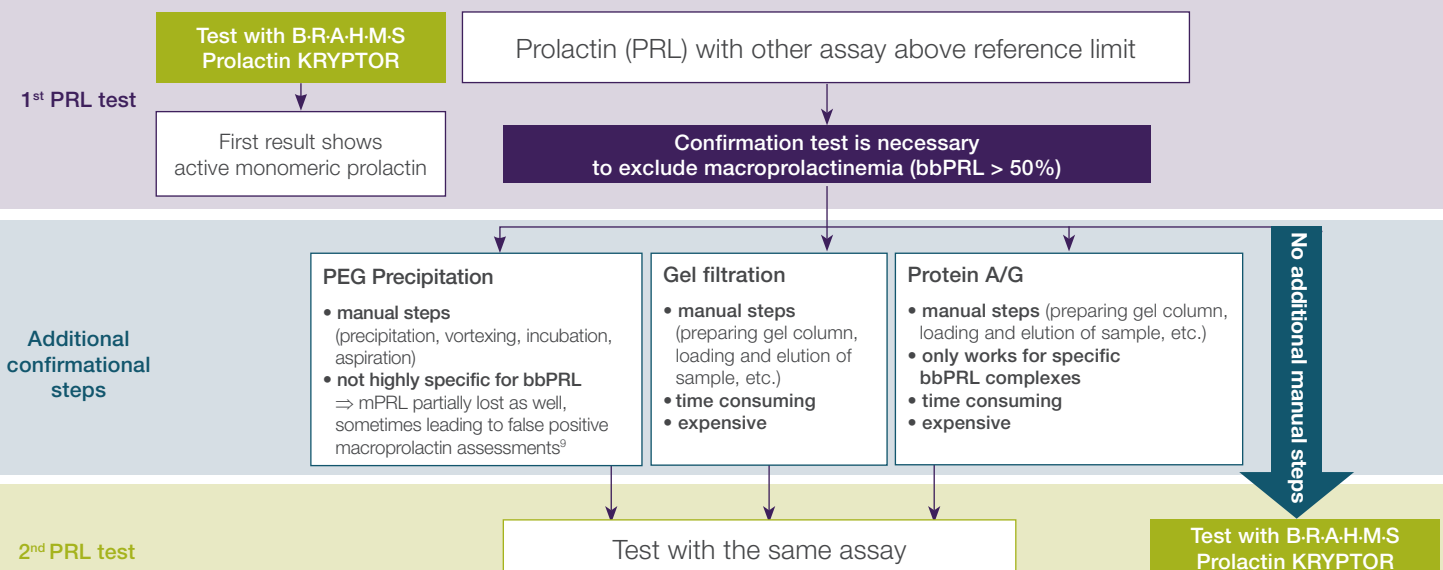


Figure 2 Different options for reliable determinations of active monomeric prolactin. ^{6,7}

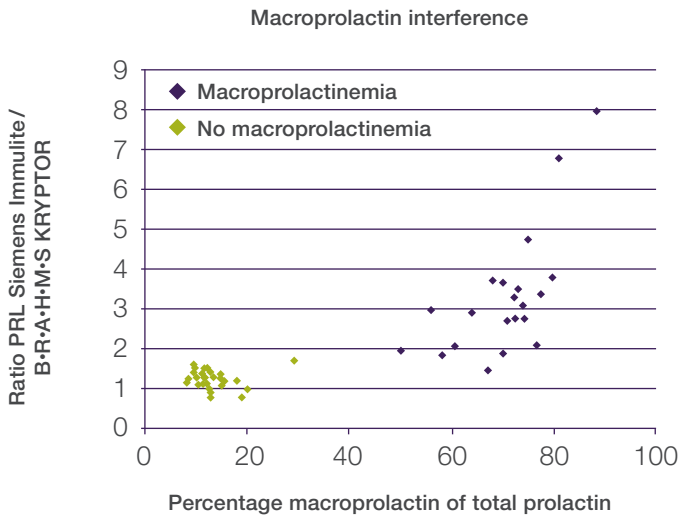


Figure 3 The use of B-R-A-H-M-S Prolactin KRYPTOR as the reference method can identify macroprolactin interference on Siemens Immulite platform. In samples with macroprolactinemia, results of the competitor assay are 2-8 fold higher than those measured with B-R-A-H-M-S Prolactin KRYPTOR.^{modified 6}

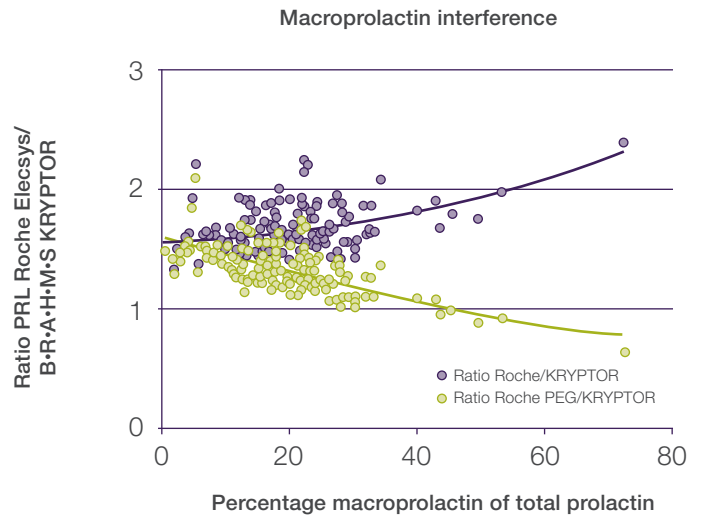


Figure 4 B-R-A-H-M-S Prolactin KRYPTOR as reference method can identify macroprolactin interference on Roche Cobas platform. After PEG precipitation, results on the competitor instrument show better comparability with B-R-A-H-M-S Prolactin KRYPTOR results.^{10, data on file}

Macroprolactin and TRACE technology

The B-R-A-H-M-S Prolactin KRYPTOR assay principle is based on an energy transfer between two different fluorescent labels on antibodies which form a sandwich complex with prolactin (figure 5 A). When bound to macroprolactin instead the spatial distance between the assay antibodies prevents the energy transfer and no signal can be measured (figure 5 B).

Thus, the combination of the assay antibody epitopes and TRACE technology results in minimal macroprolactin reactivity.

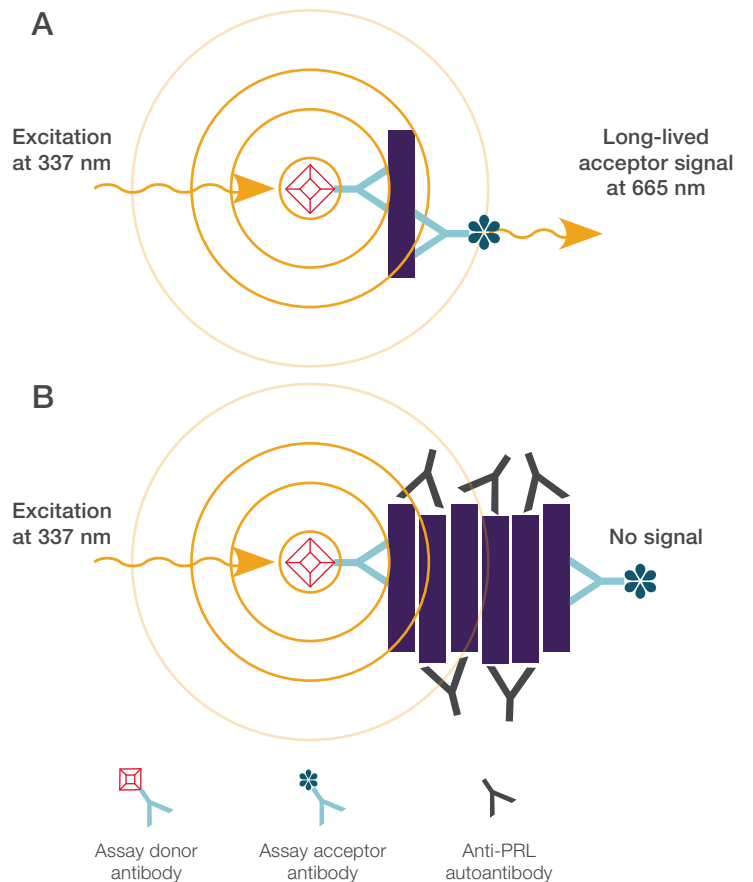
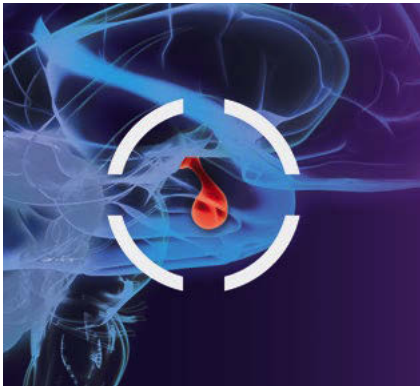


Figure 5 B-R-A-H-M-S Prolactin KRYPTOR assay antibodies bound to monomeric prolactin (A) and macroprolactin (B).



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