

# Retinol-Binding Protein (RBP)

Quantitative determination of Retinol-Binding Protein levels in serum and plasma using turbidimetric technology

Retinol-Binding Protein (RBP) is a carrier protein for vitamin A (retinol) in blood. RBP is synthesised and stored in the liver until binding to retinol. It is cleared by renal filtration after retinol release, where it is almost completely reabsorbed by the proximal renal tubule.<sup>1,2</sup> The concentration of RBP in the circulation remains mostly constant in healthy individuals, though the levels can be altered in many conditions and disorders such as;

- ➔ Vitamin A deficiency
- ➔ Undernutrition
- ➔ Diabetes
- ➔ Renal dysfunction



## RBP and vitamin A

Vitamin A is mainly stored in the liver from where it is transported throughout the body by RBP. In cases of vitamin A deficiency, the liver will not store sufficient amounts of vitamin A to ensure the constant level of the RBP-retinol complex in blood. Vitamin A deficiency (VAD) is therefore reflected by reduced levels of the surrogate marker RBP, making the assay useful in the assessment of vitamin A status.<sup>2,3</sup>

## RBP and undernutrition

RBP is a low molecular weight protein and therefore responds to both protein and calorie restriction and can reflect the individual's protein- and nutritional status. Studies have shown an inverse association between RBP levels and the severity of malnutrition and RBP can therefore be used as an aid in determining undernutrition.<sup>4,5</sup>

## RBP and diabetes

RBP levels are elevated in type 2 diabetes (T2D) and gestational diabetes. They are positively correlated with the magnitude of insulin resistance and associated with several comorbidities of T2D.<sup>6-8</sup> Measurements of serum RBP can therefore serve as a non-invasive and accessible method for assessing the risk of diabetes.

## RBP and renal dysfunction

RBP is filtered in the glomerulus of the kidney, reabsorbed, and catabolised by the proximal tubules.<sup>1</sup> In patients with reduced glomerular filtration rate (GFR) the levels of RBP will accumulate in blood.<sup>9,10</sup> Hence, an increase in serum and plasma levels of RBP may reflect renal dysfunction.<sup>11,12</sup>

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## Immunoassay performance

Gentian Retinol-Binding Protein Immunoassay is an instrument-independent turbidimetric assay. Our instrument validation team can assist with establishing applications on clinical chemistry analysers of interest. The assay is CE-marked and FDA 510(k) Exempt.

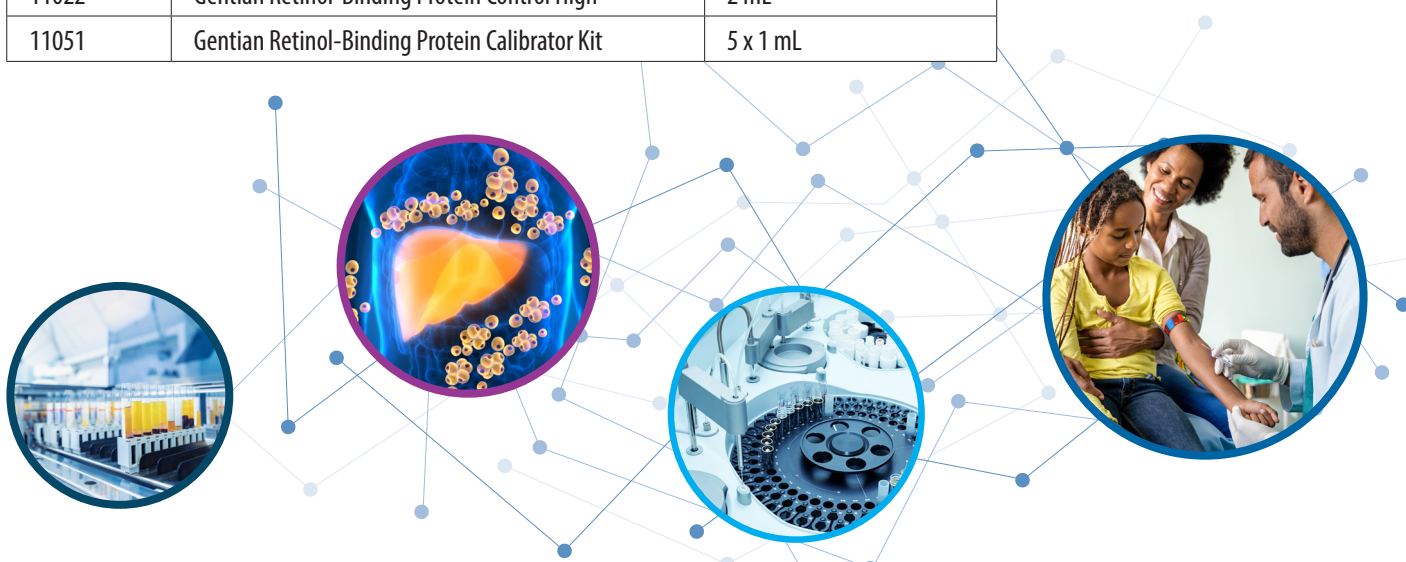
Gentian Retinol-Binding Protein Immunoassay Performance	
Sample type	Fresh plasma and serum
Assay type	Turbidimetric assay
Format	Liquid reagents, ready to use
Precision*	CV <5%
LoQ*	7.81 mg/L
Security zone*	Up to 600 mg/L
Measuring range**	7.8-139 mg/L

\*Instrument specific \*\*Lot- and instrument specific

The method has been standardised with a benchmark method traceable to the international standard.

## Product range

Product no.	Product	Content
11001	Gentian Retinol-Binding Protein Reagent Kit	R1: 40 mL R2: 13 mL
11020	Gentian Retinol-Binding Protein Control Low	2 mL
11021	Gentian Retinol-Binding Protein Control Medium	2 mL
11022	Gentian Retinol-Binding Protein Control High	2 mL
11051	Gentian Retinol-Binding Protein Calibrator Kit	5 x 1 mL



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### References:

1. Steinhoff JS et al. *Nutrients*. 2022;14(6) 2. Tanumihardjo SA et al. *J Nutr*. 2016;146(9):1816s-48s 3. de Pee S, Dary O. *J Nutr*. 2002;132(9 Suppl):2895s-901s 4. Sergi G et al. *Eur J Clin Nutr*. 2006;60(2):203-9 5. Smith FR et al. *Am J Clin Nutr*. 1975;28(7):732-8 6. Nono Nankam PA, Blüher M. *Mol Cell Endocrinol*. 2021;531:111312 7. Mousavi SN et al. *Indian J Endocrinol Metab*. 2023;27(2):96-104 8. Flores-Cortez YA et al. *Mol Med Rep*. 2022;26(1) 9. Zhang WX et al. *Genet Mol Res*. 2014;13(4):8126-34 10. Xun C et al. *Ann Clin Lab Sci*. 2018;48(2):205-7 11. Zhang L et al. *Dis Markers*. 2020;2020:8830471. 12. Ye Z et al. *Evid Based Complement Alternat Med*. 2021;2021:4990941.