

# D - 3 - Hydroxybutyrate (Ranbut)

NP

## Key Benefits of the Randox D - 3 - Hydroxybutyrate (Ranbut) Assay

- **Superior methodology** when compared to other commercially available ketone detection tests. For example, the nitroprusside method used in semi-quantitative dipstick tests only detects acetone and acetoacetate. D - 3 - hydroxybutyrate is the most abundant ketone produced during ketosis the measurement of this analyte is more sensitive and specific.
- **Exceptional correlation** coefficient of  $r=0.9954$  when compared against other commercially available methods.
- **Excellent precision** of  $<3.5\%$  CV.
- **Calibrator and controls available** offering a complete testing package.
- **Applications available** detailing instrument-specific settings for the convenient use of the Randox D - 3 - Hydroxybutyrate (Ranbut) assay on a wide range of clinical chemistry analysers.
- **New liquid stable Ranbut assays** available

## Biological Significance

During prolonged periods of starvation or impaired carbohydrate metabolism, starved cells begin to signal for energy from fat metabolism. Ketone bodies (acetoacetate, D-3-hydroxybutyrate and acetone) are produced from fatty acid beta-oxidation; a process called ketosis which takes place in the liver. Of the three ketones, D-3-hydroxybutyrate is the major ketone in the body <sup>1,2</sup>.

## Clinical Significance

Ketosis produces ketones which is not normally dangerous. If left untreated, especially in diabetes, ketoacidosis (high levels of ketones) develops which can be fatal and damage the liver and kidneys <sup>3</sup>. In type 1 diabetes mellitus (T1DM), the body is unable to produce insulin resulting in bodily cells not receiving energy from glucose, causing the body to release hormones to breakdown fat for energy, producing ketones. Diabetic ketoacidosis is commonly triggered by an illness, infection or missing insulin treatments <sup>4</sup>.

1. Hsu WS, Kao JT, Tsai KS. Fully automated assay of blood D-3-hydroxybutyrate for ketosis. Journal of Formosan Medical Association 1993; 92(4): 336-340.

2. Vigli de Kreutzenberg S, Avogaro A. The role of point-of-care 3-hydroxybutyrate testing in patients with type 2 diabetes undergoing coronary angiography. Journal of Endocrinological Investigation 2017; 40(6): 627-634.

3. Hecht M. Ketosis vs. Ketoacidosis: What You Should Know. <https://www.healthline.com/health/ketosis-vs-ketoacidosis> (accessed 6 August 2019).

4. Mayo Clinic. Diabetic ketoacidosis. <https://www.mayoclinic.org/diseases-conditions/diabetic-ketoacidosis/symptoms-causes/syc-20371551> (accessed 6 August 2019).