

Pyrroleanalysis (HPL/KPU)

	Result	Reference value
haemopyrrolactam complex (HPL)	0,9	<1 µmol/L
Total excreted amount HPL	1,62	<1,4 µmol/24 hours*
Kryptopyrrole 1	0.13	<0,125 units/24 hours
Kryptopyrrole 2	1.06	< 0,9 nmol/24 hours

Disturbances in hemoglobin synthesis may be hereditary or due to acquisition through environmental impacts or stress. These disturbances may result in increased concentrations of pyrroles in the urine. Some are more precisely called hydroxy hemopyrrolactamuria (HPU), because the body excretes excessive amounts of the substance hemopyrrolactam-complex (HPL) via the urine. HPL is a complex consisting of hydroxy-2,3-dimethylpyrrolidone-5-on and hydroxyhaemopyrrolinon-2-on complexed with pyridoxal-5-phosphate (active vitamin B6) and the minerals zinc and manganese. HPU is primarily believed to be linked to hereditary factors. Whereas kryptopyrroluria (KPU) is believed to be more consistent with stress load and may increase in response to this.

HPU/KPU can also be described as a deficiency of vitamin B6. Due to this deficit, the body reduces levels of zinc, chromium, and, to a lesser degree, manganese and magnesium. Active vitamin B6 plays a role in the production of vitamin B3 from the amino acid tryptophan, therefore decreased B3-levels are also often seen in HPU/KPU. The extent of the deficiencies is so large that they cannot be counterbalanced by foods that are rich in these vitamins or minerals. ---or--- The extent of these nutritional deficiencies may not be adequately remedied by dietary adjustment alone. Specific supplementation strategies are usually required.

*Reference ranges

HPL- Reference ranges for adults are determined from Good Laboratory Practise, and are assigned following grading:

<0,6	µmol HPL/24 hours	HPU absent
0,6 - 0,85	µmol HPL/24 hours	HPU weak/doubtful
0,85 - 1,4	µmol HPL/24 hours	HPU present /weak positive
1,4 - 3,5	µmol HPL/24 hours	HPU positive
3,5 - 5,6	µmol HPL/24 hours	HPU strong positive

Children under 10 years, with HPL-ranges above 0,65 µmol/24 hours, or girls older than ten years who do not menstruate, are considered positive for the presence of HPU. Children with HPL ranges above 0,9 µmol/24 hours, older than ten years, or girls younger than ten years who menstruate, are also considered positive for the presence of HPU. Ranges will increase during puberty. With a range of 0,85 µmol HPL per 24 hours urine or more, treatment may be started and monitored for 2-3 months.

Risk of false negative results

A false negative value can occur with regular intake of B-vitamins (especially vitamin B6 or biotin) and/or zinc and/or manganese. A false negative value can also be reported if diuretic medication has been consumed the day before collection, or if not all urine has been collected during the collection period, or if the sample has been collected during or immediately after menstruation.