

## **Determination of both Human insulin and Rat insulin in a sample, by combined analysis of the sample using both the Human Insulin ELISA and the Rat Insulin ELISA**

### **1. Determination of Human insulin in the sample**

Analyze the sample in the Mercodia Human Insulin ELISA (10-1113-01) according to the Directions for Use. The Mercodia Human Insulin ELISA is specific for human insulin and does not cross react with rat insulin (< 0,7 %).

Obtained result of insulin in the Human Insulin ELISA is equal to the actual level of human insulin in the sample.

### **2. Determination of Rat insulin in the sample**

The same sample is also analyzed in the Mercodia Rat Insulin ELISA (10-1124-01), with the calibrator levels converted to pmol/L (1 µg/L = 175 pmol/L).

Obtained result of insulin in the Rat Insulin ELISA does not give the level of rat insulin in the sample directly, as human insulin has a 167% cross reactivity in the Rat Insulin ELISA.

The obtained result of insulin in the Rat Insulin ELISA should therefore be subtracted by the determined level of human insulin under section (1) above, to get the level of rat insulin in the sample.

Remember that the cross reactivity of human insulin in the Rat Insulin ELISA is 167%. The determined level of human insulin under section (1) above should therefore be multiplied with 1.67 and converted to pmol/L (1mU = 6 pmol/L). This value is then used to calculate the level of rat insulin in the sample.

### **Example**

Equal volumes of both human and rat insulin calibrators were mixed

Human insulin 30 mU/L	=	180 pmol/L
Rat insulin 1 µg/L	=	174 pmol/L

The following insulin concentrations is obtained after mixing

Human insulin	=	90 pmol/L
Rat insulin	=	87 pmol/L

Analysis in the Human Insulin ELISA yields the result of 15 mU/L = 90 pmol/L, since this assay does not cross react with the rat insulin in the sample.

Analysis in the Rat Insulin ELISA yields the result of 237 pmol/L.

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**Technical Note**

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Remember that the cross reactivity of human insulin in the Rat Insulin ELISA is 167%!

The measured result in the Rat Insulin ELISA is both the human and rat insulin, as displayed below:

90 pmol/L (human insulin) x 1,67 + 87 pmol/L (rat insulin) = 237 pmol/L.

The level of Rat insulin in the sample is then easily calculated:

237 pmol/L - 90 pmol/L (human insulin) x 1,67 = 87 pmol/L.

## REFERENCES

1. Mercodia AB Research and Development Laboratory, Uppsala, Sweden