

## **Why is there a market for GLP-1 analogs and GLP-1 antibodies?**

*By Scientific Director Dr. L.O. Uttenthal*

### **GLP-1 analogs for the treatment of type-2 diabetes**

GLP-1 is an important peptide hormone which is released from the intestine when we eat. It stimulates the secretion of insulin from the pancreas and helps to ensure that enough insulin is released to match the amount and composition of the food that is eaten. Insulin is the hormone that enables the cells of the body to absorb and utilize the glucose derived from the digested food, and an absolute or relative deficiency of insulin causes the widespread disease, diabetes mellitus. Diabetes is rapidly increasing around the world, maybe affecting up to 10% of the total population, and the vast majority of cases are the somewhat milder form, type 2, in which insulin is still being produced by the pancreas, but not enough to fully meet the body's requirements. That is why many patients with type-2 diabetes can be treated without resorting to insulin injections, e.g. with medicines that increase the secretion of natural insulin from the pancreas. This is where GLP-1 comes in as the hormone that has the most potent stimulatory effect on insulin secretion in response to food. Although type-2 diabetes is not caused by GLP-1 deficiency, the condition can be treated by administering an excess of GLP-1 or long-acting GLP-1 analogs like exendin-4; it is also possible to strengthen and prolong the action of natural GLP-1 in the body by giving medicines that inhibit its breakdown (DPP-4 inhibitors). These treatments increase the amount of insulin that is secreted in relation to the food that is eaten, and the high rise in blood sugar (i.e. the diabetic condition) is ameliorated.

### **Advantages of the new treatments**

These treatments have certain advantages over conventional treatment with insulin or older insulin-stimulating medicines. GLP-1 only releases insulin if the blood sugar is normal or high, so that hypoglycemic attacks due to excess insulin and low blood sugar do not occur. In addition, GLP-1 and exendin-4 moderate the appetite and certain gastrointestinal functions, so that the treatment does not lead to the weight gain that is a typical side effect of the other treatments. In fact, direct treatment with a synthetic long-acting GLP-1 analog or with exendin-4 leads to moderate weight loss, which is why similar strategies are being considered for the treatment of obesity, even in the absence of diabetes.

### **BioPorto's GLP-1 antibodies**

BioPorto has the world's leading portfolio of commercially available monoclonal antibodies against GLP-1. These have been selected on the basis of the different ways in which they bind to the GLP-1 molecule. Some bind sideways to both active and inactive forms of the molecule, and some bind end-on, exclusively to the biologically active forms. Analysis of GLP-1 in the blood is a problem because a complex mixture of closely related active and inactive forms of the hormone is always present. BioPorto's antibodies are used in different combinations with themselves or specially developed polyclonal antibodies to analyze different forms of GLP-1 during the development and testing of GLP-1-related treatments. This may be in early development phases and clinical phase I and/or in process and quality control of therapeutic products. However, it is NOT relevant to measure GLP-1 in relation to diagnosing diabetes, as the minor differences that may occur are not diagnostic, and type-2 diabetes is not caused by GLP-1 deficiency. BioPorto's GLP-1 antibodies are chiefly sold to customers in the pharmaceutical industry for use in drug development.

BioPorto will maintain its focus on GLP-1 antibody sales and the development of further antibodies designed to meet the foreseeable technical requirements of the therapeutic initiatives in the GLP-1 and DPP-4 areas.