

## Auto-Antibodies against the MC4R for the Diagnosis and Treatment of Obesity



### Catchwords:

**Auto-antibodies against the human melanocortin-4 receptor (MC4R), biological markers and methods for diagnosing and treating obesity and related conditions, detection of these auto-antibodies, modulation of the activity these auto-antibodies**

### Background

Although obesity is an individual clinical condition, it is increasingly viewed as a serious and growing public health problem. Conventional treatment for obesity includes dietary modification and pharmacotherapy. However, latter is generally only recommended in obese patients with a high Body Mass Index (BMI) or in patients with a lower BMI who have android obesity. As such, there is a continuing need to develop new therapeutics for use in the treatment of obesity and related conditions.

The hypothalamic melanocortin-4 receptor (MC4R) is part of a central appetite reducing (anorexi-genic) pathway. It is known that mutations of this receptor can lead to a loss of function and result in severe obesity.

### Invention

The invention is directed to biological markers and methods for diagnosing and treating obesity and related conditions by modulating the activity of auto-antibodies against the human melanocortin-4 receptor (MC4R).

### Advantages

The inventors have found that auto-antibodies to the human MC4R, especially against a short peptide sequence of the constitutive active N-terminal (NT) domain of the MC4R, are about twofold more prevalent in overweight and obese individuals than in normal or underweight individuals. Furthermore, they have characterized the functional properties of these auto-antibodies and shown that they block the activity of the MC4R. Accordingly, their detection in individuals serves as a marker for obesity and in general for the propensity for individuals to become overweight and modulation of the activity of these auto-antibodies. Preventing their binding with the MC4R, provides therapeutic treatment for overweight conditions and obesity.

### Applications

These findings can be applied for both, the diagnosis and treatment of obesity and related disorders. In particular, various methods for the detection of such auto-antibodies can be used for the diagnosis of this new subform of obesity. Furthermore, causal treatment can be applied in these patients, which consists of elimination, neutralization or displacement of the auto-antibodies from the MC4R.

### IP-Position

<b>Owner:</b>	University of Basel
<b>IP Status:</b>	Patent Filed
<b>Licensing Condi-tions</b>	Exclusive or Non-exclusive License
<b>Collaboration</b>	Desired

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