**Introduction**

**Obesity** and its associated disorders are one of the major health problems in the developed world. Obesity has been mainly related with an energy imbalance when energy intake exceeds energy expenditure, however other factors must also be considered. Recent insight suggests that an altered composition and diversity of gut microbiota could play a critical role in energy balance and metabolism, implicating it as a major factor in the development of obesity [10]. Targeting microbiota in order to modulate the microbiota composition with probiotics is considered as a promising strategy for the development of new solutions for its treatment [12].

**The association between microbiota composition and obesity**

**Microbiota functions**

- The human gut is home to $10^{14}$ bacteria, located mainly in the colon.
- The functions of the microbiota can be broadly categorized into three groups: metabolic, protective and structural.
- The host’s intrinsic characteristics, such as genetic factors, the state of the immune system and nutrition influence the composition and metabolic activity of the gut microbiota.

**Dysbiosis microbiota**

- Obesity has been correlated with the altered ratio of the two dominant phylum groups (>90%)
- Suggested mechanisms that link the changes observed in gut microbiota composition with the obesity and associated disorders:

**Treatment approach**

**PROBIOTICS**

Live microorganisms that when administrated in adequate amounts have been shown to confer health benefits to the host.

**Lactobacillus** and **Bifidobacterium** are the probiotic strains typically consumed by humans.

**Lactobacillus gasseri** appears to be the probiotic strain that can best assist weight loss in humans.

**Probiotics mechanisms of actions:**

- **Restored gut microbiota**
- **Gut permeability**
- **AMPK**
- **FIAT**
- **PPY**
- **GLP-1**
- **Ghrelin**
- **GLP-2**
- **Occititin ZO-1**
- **Proinflammatory cytokines**
- **LPS**
- **LPL**
- **Fat storage**
- **Satiety**
- **Energy intake**
- **Body weight**

**Conclusions**

- There is clear evidence that the gut microbiome has a profound effect on the balance between health and disease.
- Obesity is associated with the abundance of **Firmicutes** and a decrease of **Bacteroidetes**. These alterations are linked with adiposity, inflammation and energy homeostasis of the individual.
- Evidence suggests that probiotics offer a promise for the treatment of obesity. They have shown efficacy reducing fat accumulation through their effects on controlling food intake, body weight and gut microbiota.
- In order to improve intervention strategies to manage obesity and obesity-related diseases, further studies are required. It is needed to better understanding of the interactions between the host and the gut microbes in individuals with obesity.

**References**