Psychopharmacological Advances in Eating Disorders

A Review of the Current Literature

Hubertus Himmerich^{1,2}, Janet Treasure^{1,2}

¹ Department of Psychological Medicine, King's College London, London, UK

² South London and Maudsley NHS Foundation Trust, London, UK

Eating disorders:

Primary eating disorders (EDs):

- Anorexia nervosa (AN)
- Bulimia nervosa (BN)
- Binge eating disorder (BED)

Approved psychopharmacological treatment:

The only psychopharmacological treatment options for EDs with approval in some countries include

- Fluoxetine for BN
- Lisdexamfetamine (LDX) for BED in the USA

Systems involved in the development of EDs:

- Brain/Neurotransmitter systems (see **Table 1**) which are closely related to
- Hormonal systems
- Immune system
- Microbiota

Currently discussed drugs

- For drug targets see **Figure 1**:
- AN
 - Aripiprazole
 - Dronabinol
 - Olanzapine
- BN
 - Fluoxetine
 - Topiramate
- BED
 - LDX

Table 1. Brain systems involved in the pathophysiology of EDs. This table attempts to categorize brain functions, anatomical structures and signal molecules in a simplified way, but in keeping with the current literature – according to the three arguably most relevant neural circuits: the self-regulatory, the hedonic and the homeostatic system.

Brain System	Self-regulatory system	Hedonic system	Homeostatic system
Functions	<ul style="list-style-type: none">• Embedding eating into social context• Individual values• Self-regulatory control	<ul style="list-style-type: none">• Desire to eat• Pleasure during food consumption	<ul style="list-style-type: none">• Integration of peripheral signals of food consumption and energy storages• Appetite regulation
Anatomical structures	<ul style="list-style-type: none">• Prefrontal cortex	<ul style="list-style-type: none">• Prefrontal cortex• Basal ganglia• Thalamus	<ul style="list-style-type: none">• Hypothalamus
Input	<ul style="list-style-type: none">• Social and cultural factors• Environment	<ul style="list-style-type: none">• Sensory organs• Hippocampus	<ul style="list-style-type: none">• Peripheral signals of food consumption and energy storages• Self-regulation system• Hedonic system
Signal molecules	<ul style="list-style-type: none">• 5-HT• NE• ACh• DA	<ul style="list-style-type: none">• DA• Glutamate• Opioids• Cannabinoids	<ul style="list-style-type: none">• Leptin• Ghrelin• Insulin• GLP-1• NPY• AgRP• α-MSH• CART• Histamine

Abbreviations: Serotonin (5-HT), norepinephrine (NE), acetylcholine (ACh), dopamine (DA), neuropeptide Y (NPY), agouti-related peptide (AgRP), melanocyte-stimulating hormone (α -MSH), cocaine and amphetamine regulated transcript (CART), glucagon-like peptide-1 (GLP-1).

Figure 1. Schematic and simplified depiction of the interplay of the hedonic system, the self-regulatory system, the homeostatic system, the body periphery and the molecular target location of selected promising medications to treat EDs. The potential indication is given in brackets.

Reference: Himmerich H, Treasure J. Psychopharmacological advances in eating disorders. *Expert Rev Clin Pharmacol* 2018;11:95-108.