

# Melanocortin Receptor Obesity Program



PALATIN  
TECHNOLOGIES, INC.

## INTRODUCTION

Palatin Technologies has an exclusive global licensing and research collaboration agreement with AstraZeneca AB, a major international pharmaceutical and healthcare business, to discover, develop and commercialize compounds that target melanocortin receptors for the treatment of obesity, diabetes and related metabolic syndrome.

The collaboration, based on Palatin's melanocortin receptor program for the treatment of obesity, includes access to compound libraries, core technologies and expertise in melanocortin receptor drug discovery and development.

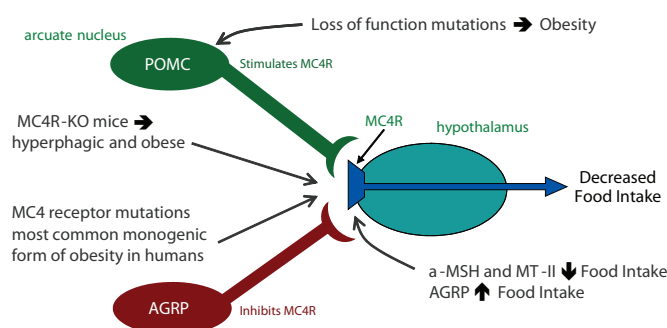
## MELANOCORTIN SYSTEM

The melanocortin system consists of five G protein-coupled receptors known as MC1-R, MC2-R, MC3-R, MC4-R and MC5-R. The functions of the receptors are modulated by the endogenous peptides  $\alpha$ -,  $\beta$ -, and  $\gamma$ -melanocyte stimulating hormone ( $\alpha$ -,  $\beta$ - and  $\gamma$ -MSH) and the adrenocorticotropic hormone (ACTH), all of which are products of the pro-opiomelanocortin (POMC) gene. In addition, the endogenous antagonists agouti and agouti-related protein (AGRP) also regulate the receptors functions.

The melanocortin system is involved in a diverse number of physiologic functions including pigmentation, steroidogenesis, energy homeostasis, exocrine secretion, inflammation, temperature control and sexual function.

The centrally located MC4-R appears to be the key melanocortin receptor involved in regulating food intake. MC4-R knockout mice are hyperphagic and obese. In humans the most common form of monogenic obesity is caused by mutations in MC4-R. In addition, signaling systems (such as leptin, ghrelin and GLP-1) involved in regulating food intake and energy expenditure mediate their effects through MC4-R.

## The Melanocortin Receptor System and Obesity



## BACKGROUND ON OBESITY

Over the past 20 years obesity has become one of the fastest growing diseases in the world. Today, more than 1.1 billion adults and over 150 million children worldwide are overweight, with over 300 million adults categorized as obese. According to the American Obesity Association, obesity is the second leading cause of preventable death after smoking and nearly one-third of adults in the United States are obese. Increased mortality, high blood pressure, diabetes and other substantial health risks are associated with being overweight and obese. Over 2.6 million deaths are attributed to diabetes each year worldwide and almost \$120 billion is spent on related costs of obesity according to the U.S. Surgeon General.

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Obesity is a chronic disease in which a person's body weight is much greater than what is considered healthy. An adult is considered obese if their body mass index or BMI is greater than 30. Obesity is caused when a person's food intake is in excess of energy expenditure with the excess stored as fat. Risk factors include genetics, medications, inactivity, psychological stress and diet. Current treatments for obesity include dieting, increased physical activity, behavior therapy, drug therapy and surgical intervention.

The global increase in the number of and rate at which people are becoming obese or overweight will continue to stress healthcare systems. The health risks associated with obesity and the difficulty of treating the disease indicate that there is a large growing need for innovative therapeutics for treating obesity.

Palatin's melanocortin receptor obesity program combines our core technologies for lead generation with our preclinical and clinical experience with the melanocortin system to develop novel therapeutics for treating obesity and related diseases. Accumulating data from genetic, pharmacological and physiological studies identify the central melanocortin system as an important regulator of energy homeostasis and potentially a key drug target for obesity.

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## **PALATIN'S PRECLINICAL DATA**

Palatin has developed libraries of small molecule, peptidomimetic and peptide compounds that modulate the function of MC4-R. The activity profile of certain of these compounds indicates that they have potential as treatments for obesity and associated diseases. In studies using animal models of obesity, selected compounds reduced food intake and body mass as well as decreasing plasma glucose and insulin levels.

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## **ASTRAZENECA COLLABORATION**

In January 2007 AstraZeneca and Palatin Technologies announced an exclusive global licensing and research collaboration agreement to discover, develop and commercialize compounds that target melanocortin receptors. In June 2008 and September 2009, AstraZeneca and Palatin Technologies amended the collaboration agreement. Under the terms of the agreement, Palatin received an upfront payment of \$10 million from AstraZeneca and additional payments of \$11.6 million plus program support and expense reimbursement. Palatin is eligible for milestone payments totaling \$145 million, with up to \$85 million contingent upon development and regulatory milestones and the balance on achievement of sales targets, together with the payment of stepped royalties on product sales. AstraZeneca has assumed responsibility for product commercialization, product discovery and development costs, with both companies contributing scientific expertise in the research collaboration.

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## **SUMMARY**

Palatin Technologies and AstraZeneca have made significant progress under the collaboration agreement, using core technologies in lead generation and expertise in melanocortin biology developed by Palatin Technologies. A near term objective of the collaboration with AstraZeneca is to advance a lead drug candidate to clinical evaluation.

*The statements in this Fact Sheet that relate to future plans, events or performance are forward-looking statements, which are made pursuant to the safe harbor provisions of Section 21E of the Securities Exchange Act of 1934. Such forward-looking statements involve significant risks and uncertainties, and actual results, events and performance may differ materially from those expressed or implied in this Fact Sheet. Factors that could cause such differences include, but are not limited to, risks pertaining to product development, clinical trial outcomes, regulatory requirements and actions, availability of required financing and other sources of funds, corporate partnering agreements and other risks disclosed in the our most recent Annual Report on Form 10-K and other periodic reports filed with the Securities and Exchange Commission. The forward-looking statements in this presentation do not constitute guarantees of future performance. We undertake no obligation to publicly update these forward-looking statements to reflect events or circumstances that occur after the date of this Fact Sheet.*

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