

Addressing knowledge gaps in the brain ghrelin signalling system - its neural circuitry and role in food-linked behaviours

The drive to search for and consume food is a fundamental survival mechanism, orchestrated by the brain through a range of behaviours in response to both internal information about energy status and external cues that let us know if food is available. But why do we eat when we're not hungry – or lose our appetite when we need it most? From the 'attention-grabbing' effect of a tasty snack even when you are full to the detrimental consequences of appetite loss in conditions such as anorexia nervosa, cancer cachexia or frailty, a disturbance or faulty processing of internal and external hunger signals can lead to disordered eating across the body weight spectrum. To better understand the brain mechanisms controlling eating and food-linked behaviours is a first step to develop effective, non-invasive therapies to help those suffering from disordered eating. Among the many signalling molecules that modulate neuronal networks that control feeding behaviour, the hormone ghrelin stands alone as the only circulating orexigenic (pro-feeding) hormone and represents a powerful tool to access and modulate brain networks in control of feeding behaviour. This thesis addresses important gaps in our understanding of the brain ghrelin signalling system, focussing on its neural circuitry and its role in food-linked behaviours. The work presented here identifies novel functional circuits involved in hunger and food-motivated behaviour and obtained new insights into how ghrelin modulates attentiveness towards environmental signals predicting food availability. Finally, a new, non-invasive strategy to stimulate the brain ghrelin signalling system has been proposed, which holds translational value.



Renée studied biomedicine in Leiden and went on to obtain a M.Sc in molecular neuroscience in Amsterdam. Her interest in studying neuronal circuitry and behaviour led her to join the lab of Prof Dickson to pursue a PhD in the neuroscience of appetite.

ISBN 978-91-8115-326-2 (PRINT)
ISBN 978-91-8115-326-9 (PDF)
<http://hdl.handle.net/2077/87257>

Printed by Stema Specialtryck AB, Borås



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