



PRINCIPE FELIPE
CENTRO DE INVESTIGACION

CIPF Seminar

Targeting Hypothalamic Microglia to Regulate Energy and Glucose Homeostasis

Speaker: **Martin Valdearcos-Contreras**, PhD

Diabetes Center-University of California, San Francisco

Date: **29/03/19- 12:30h**

Place: Sal3n de Actos CIPF

Abstract: The prevalence of obesity has reached epidemic proportions worldwide and current preventive strategies and medical interventions have not limited this upsurge, underscoring the need for new and effective ways to mitigate metabolic diseases. Recent studies implicate glial cells as physiological regulators of the hypothalamic control over energy balance and highlight the potential benefit of exploring how such non-neuronal cells contribute to the pathogenesis of obesity. My research interests are focused on the emerging field of neuroimmunology, in particular how immunological and metabolic responses within the hypothalamus regulate homeostasis and contribute to disease pathogenesis. We have shown that microglia, resident macrophages of the CNS, can sense rising levels of saturated fats in the mediobasal hypothalamus, and transduce this sensory capacity to instruct local neurons to regulate energy balance. Moreover, using innovative genetic mouse models combined with bone marrow lineage tracing, we showed that diet-induced microgliosis is heterogeneous, and involves both resident and bone marrow-derived cells that acquire microglial morphology. Also, we showed that mice can be protected from diet-induced weight gain by controlling microglial inflammatory signaling, and that spontaneously forcing microglial inflammatory signaling is sufficient to increase both food intake and weight gain, even in the absence of an obesity-promoting diet. Recently, we also found evidence that microglia are critical intermediary cells that transmit the inflammatory signals to regulate systemic glucose tolerance. Together, these findings indicate that microglia are critical mediators of hypothalamic function. The role of hypothalamic immune signaling in response to nutrient excess is a novel interdisciplinary field which has the potential to uncover new therapeutic targets to control metabolic function, obesity and its consequences.

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