NEUROENDOCRINOLOGY OF MOTHERHOOD: PROLACTIN AND THE MATERNAL BRAIN IN MICE

Fernando Martinez-Garcia [1], Hugo Salais-López [1], Mireia Hontana[1], Enrique Lanuza[2], Carmen Agustín-Pavón[2]
Unitat Mixta de Neuroanatomia Funcional UV-UJI
[1]Unitat Predepartamental de Medicina, Facultad de Ciències de la Salut, Universitat Jaume I de Castelló. Castelló de la Plana
[2]Departament de Biologia Cel·lular, Funcional i Antropologia, Facultat de Ciències Biològiques, Univesritat de Valencia, Burjassot (València)

Motherhood entails hormone-mediated transient changes in social behaviour, making females prone to take care of pups and defend them. Since prolactin (PRL) is a key element in the induction of such a maternal state in rats, we have explored this issue in mice by means of two experiments.
First, using immunostaining for pSTAT5 (key element of PRL signalling cascade) we compared the distribution of PRL-activated cells in the brains of virgin, late-pregnant and postpartum females. The results indicated that during late-pregnancy and postpartum PRL modulates the socio-sexual brain network (SBN), including the lateral septum, medial extended amygdala (MeEA), medial preoptic area (MPO), paraventricular (Pa), supraoptic (SO) and ventromedial hypothalamus (VMH) and periaqueductal grey. The central amygdala also shows enhanced PRL signalling during motherhood.
Then, we analysed pup-retrieval in dams, pup-sensitized (*godmothers*) and pup-naïve virgins, using a special setup in which females should climb a wall to get access to the pups. This demands an extra effort to retrieve pups, thus allowing evaluation of maternal motivation. As expected, dams showed high motivation for pups, whereas godmothers' motivation was slightly higher than that of pup-naïve virgins.
Analysis of pSTAT5 immunohistochemistry in the brains of these females, allowed checking whether PRL signalling in particular nuclei of the SBN correlates with motivation for pups. Only when compared apart from dams, godmothers showed significant higher levels of PRL signalling than pup-naïve virgins in the MPO and posterior intralaminar thalamus. This is not due to increased circulating PRL (checked with ELISA), but to site-specific PRL signalling facilitation. Moreover, dams (but not virgin females) showed correlation of maternal motivation with PRL signalling in the Pa, MeEA and SO. These nuclei seem, therefore, involved in PRL-dependent increased motivation for pups during motherhood.
Funded by *Generalitat Valenciana* (PROMETEO2016/076), MINECO-FEDER (BFU2016-77691-C2- 1-P and C2-2- P) and UJI (UJI-B2016- 45)