Stefanos Stagkourakis, PhD
Postdoctoral research fellow
Anderson Lab

Talk Title: Setting the gain for paternal behavior: a journey on the lactotroph axis and brain activity in two species

Abstract: Parental behavior is essential for the survival of offspring and is near-universal in the animal kingdom. For certain classes of animals including mammalian species, parental behavior is expressed by both sexes. To gain an understanding of the neural and endocrine mechanisms underlying parental behavior, we used two rodents at the opposite ends of the paternal behavior continuum. We explored the significance of a recently revealed species difference in the neuroendocrine network in control of prolactin secretion, which while in females has a well-documented role in lactation and maternal behavior, its effects are unclear in the male. Tracking the endogenous activity along the neuroendocrine axis in control of prolactin, we identified that distinct hypothalamic rhythms in the male rat and mouse set low *vs* high serum prolactin levels, with differential impact on the activity of medial preoptic area galanin neurons and paternal behavior levels in the sires of the two species. Optogenetic manipulation of this phasic activity altered serum prolactin and the expression of paternal care in mouse sires, while repeated i.p. injection of prolactin in non-paternal rat sires induced aspects of it. These findings identify the neuroendocrine axis of prolactin as a candidate of evolutionary adaptation of a gain control system determining a species' parental strategy.