



## 2017 IGBMC Summer Internship

### Relevance of vitamin A signaling in postnatal neurogenesis

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Micronutrients such as vitamin A or omega-3 polyunsaturated fatty acids (PUFAs) are essential part of our diet and act as bioactive molecules critical for mammalian development and physiology. Nuclear hormone receptors function as sensors of such molecules and translate their signal into gene transcription acting as ligand-regulate transcription factors. We showed that activities of receptors involved in vitamin A signaling are directly relevant for regeneration processes after neuronal damage (Huang et al., Nat. Neuroscience 2011) or affective behaviors (Krzyszosiak et al., Neuron 2010) or brain development (Rataj-Baniowska et al., 2015). More recently we have also identified unique in their class, new bioactive forms of vitamin A, which display new activities as compared to all-trans retinoic acid, a known active form of vitamin A (Ruhl et al., Plos Genet. 2015). To better understand the mechanisms through which vitamin A and its different bioactive forms control these processes we propose to evaluate post-natal neurogenesis in mice carrying null mutations for specific retinoid receptors or enzymes involved in synthesis of active forms of vitamin A. Combined with recent clinical data, obtained results should have direct relevance for understanding of some neurodevelopmental disorders. The trainee will have an opportunity to learn techniques of quantitative and qualitative analyses of gene expression including quantitative RT-PCR and/or immunohistochemical detection of proteins.