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LES SÉMINAIRES DE L'INMG

*Neural crest in forebrain development
from embryology to pathophysiology*

Par

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Jeudi 8 décembre 2016

14 heures

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Abstract

In my group, we study the neural crest, a unique cell population that emerges from the primitive neural field and which has a multi-systemic and structural contribution to vertebrate development. Over the last decade, I have been dedicating myself to the cellular and molecular background of the observation I made in 2004, that the cephalic neural crest (CNC), exerts an autonomous and prominent control on forebrain development. This notion has broken the traditional view of how the brain develops. By using exquisite grafting experiments in combination with focal spatially and temporally controlled transgenesis, we have discovered the unexpected and potent “paracrine role that the CNC exerts on forebrain growth and patterning early in development and documented this mechanism at the level of cell interaction, signalling and gene expression. We are now following this exiting line of research, which revisits fundamental concepts in Neurosciences. This notion provides also a conceptual renewal, which is biomedically relevant. The mechanisms identified so far in our model are conserved across tetrapodes, but some social behavioural features are specific to amniotes. Our ongoing project and future directions are to explore the aetiology of neural disorders and behavioural impairments in Humans and in the light of CNC dysfunctions.

If you wish to meet Sophie Creuzet, please contact Valérie CASTELLANI (valerie.castellani@univ-lyon1.fr).

Selected publications:

1. Couly G., Creuzet S., Bennaceur S., Vincent C., and Le Douarin N. M. (2002). Interaction between Hox-negative neural crest cells and the foregut endoderm in patterning the facial skeleton in the vertebrate head. **Development**, 129, 1061-73.
2. Creuzet S., Couly G., Vincent C. and Le Douarin N. M. (2002). Negative effect of Hox gene expression on the development of neural crest derived facial skeleton. **Development**, 129, 4301-13.
3. Creuzet S., Schuler B., Couly G., and Le Douarin N. M. (2004). Reciprocal relationships between Fgf8 and neural crest cells in facial and forebrain development. **Proc. Natl. Acad. Sci. USA**. 101, 4843-7.
4. Creuzet S., Martinez S., and Le Douarin N. M. (2006). The cephalic neural crest exerts a critical effect on forebrain and midbrain development. **Proc. Natl. Acad. Sci. USA**. 103, 14033-8.
5. Le Douarin, N.M., Brito J.M., and Creuzet S. (2007). The role of the neural crest in face and brain development. **Brain Res. Reviews**, 55,237-47.
6. Le Douarin N.M. and Creuzet S.E (2009). Craniofacial patterning. The Skeletal System. **Cold Spring Harbor Laboratory Press**, 53, 117-147.
7. Creuzet S. E. (2009). Neural Crest Contribution to Forebrain Development. Book chapter In Development of Patterning of the Vertebrate Forebrain. **Semin. Cell and Dev Biol**, 20, 751-9.
8. Creuzet S.E. (2009) Regulation of pre-otic brain development by the cephalic neural crest. **Proc. Natl Acad. Sci. USA**, 106, 15774-9.
9. Garcez R. C., Le Douarin N. M., and Creuzet S. E. (2014). Combinatorial activity of *Six1-2-4* genes in cephalic neural crest cells controls craniofacial and brain development. **Cell Mol Life Sci**, 71, 2149-64.
10. Aguiar D.P., Sghari S., and Creuzet S.E (2014) .The facial neural crest controls fore- and midbrain patterning by regulating *Foxg1* expression through *Smad1* activity. **Development**, 141, 2494-505.
11. Cajal M., Creuzet S.E., Papanayotou C., Sabéran-Djoneidi D., Chuva de Sousa Lopes S., Zwijsen A., Collignon J., and Anne Camus (2014). A conserved role for non-neural ectoderm cells in early neural development. **Development**. 141, 4127-38.
12. Creuzet, Viallet, Ghawitian, Thélou, Alrajeh, Costagliola, Le Borgne, Buchet-Poyau, Aznar, Buschlen, Hosoya, Thibert, and Billaud (2016). LKBI signaling in cephalic neural crest is essential for vertebrate head development. **Dev Biol**. 418:283-96