

[Accueil](#) > [Recherche](#) > [Animation scientifique](#) > [Evénements](#)

## Axon tension regulates fasciculation/defasciculation through the control of axon shaft zippering

le 12 septembre 2019

11h30

Séminaire d'Alain Trembleau (Institut de Biologie Paris Seine)

The construction of axonal projections from a given neural tissue to its final target is in many cases a multistep process, in which individual axons are sequentially guided from one area to another by cues inducing specific decisions at the level of axonal growth cones. A fundamental principle governing axon pathfinding resides in the control of their fasciculation and defasciculation. Despite the key roles played by axon fasciculation and defasciculation in the development of the nervous system, little is known about their dynamics and the underlying biophysical mechanisms. In a model system composed of neurons grown *ex vivo* from explants of embryonic mouse olfactory epithelia, we observed that axons dynamically interact with each other through their shaft, leading to zippering and unzipping behavior that regulates their fasciculation. Using pharmacological and biophysical manipulations, we showed that zippering arises from the competition between axon-axon adhesion and mechanical tension in the axons, hence uncovering an unexpected role of tension in the regulation of axon fasciculation. Furthermore, taking advantage of the relationship between axon tension and adhesion at zippers, we assessed an estimate of the axon:axon adhesion force by measuring axon tension using the Biomembrane Force Probe technique. In this talk, I will present these data obtained *ex vivo*, and our current strategy aiming at investigating the role of mechanical tension in the fasciculation and sorting of olfactory axons *in vivo*, in the live zebrafish.

Ref: Šmít D, Fouquet C, Pincet F, Zapotocky M, Trembleau A. Axon tension regulates fasciculation/defasciculation through the control of axon shaft zippering. *eLife*. 2017 Apr 19;6. pii: e19907.

Alain Trembleau est invité par Annie Andrieux.

Infos pratiques

---

Lieu

Amphi Kampf

Mise à jour le 30 juillet 2019