POSTDOCTORAL POSITION TO STUDY THE ROLE OF PULSATILITY IN THE MORPHOGENESIS OF JELLYFISH CANAL NETWORKS

A position is available for a motivated postdoc in the laboratory of complex matter and systems (MSC) at the University of Paris Cité in France. The main focus of the group is network morphogenesis in living systems. The subject of the postdoc is to study the role of pulsatility in the formation of loops in networks. Many models explain the formation of branched networks, but only few can explain reticulated ones. Some theoretical investigations show that the reversal of flows favors the presence of loops. Here the question is to look if pulsatility affects morphogenesis and supports the presence of loops in vascular networks of biological systems.

Project:

The current position is situated within a consortium for a Human Frontiers Science Program project, which includes an experimental cardiovascular biologist at the University of Leuven (E. Jones, Belgium) and a theoretical physicist at the University of Pennsylvania (E. Katifori, USA). In MSC we will use Aurelia jellyfish as an experimental model. The scyphozoan jellyfish Aurelia belongs to the cnidarian, which is an ancient phylum considered a sister group to all bilaterian animals, including mammals. Common mechanisms found in jellyfish and mammals will highlight their universality possibly applying to their common ancestor and it descendants.

Responsibilities:

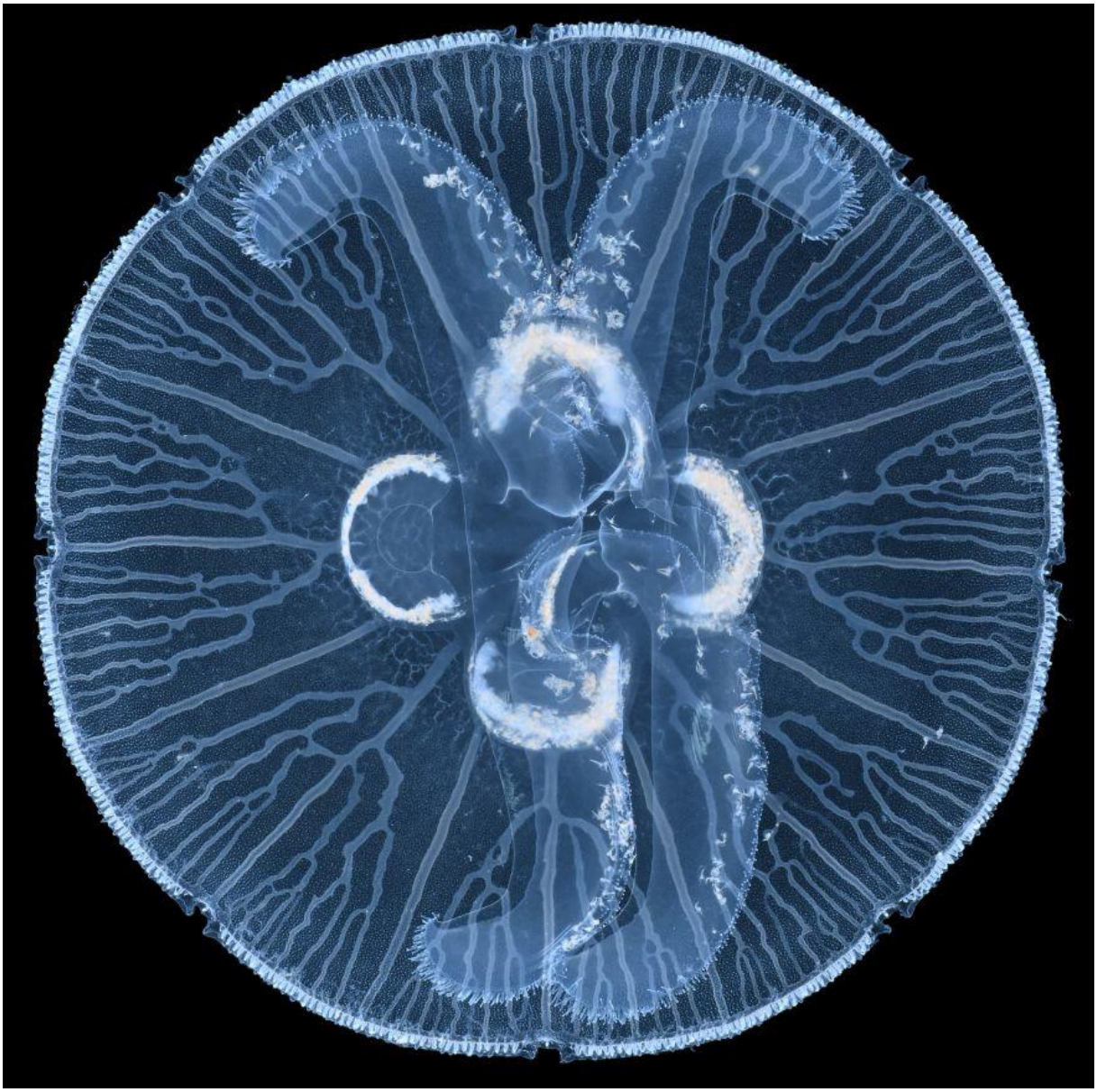
In Aurelia jellyfish you will study how the pulsatile flow in the canals is generated by cilia movements and squeezing of the deformable canals by the swimming muscle. During development you will study how canal network morphogenesis is affected by pulsatility by interventions that include changing the propagation of the flow pulsatility or impairing the pulsatility generated by the swimming. Complementary, you will help to study how pulsatility is playing a role in the morphogenesis of canal networks with topologies akin to arterial malformations (MVAs), defects due to the creation of shortcuts between veins and arteries that occur in patients when the blood pulsatility is suppressed with an implanted constant flow pump.

Offer:

Funding is available for 3 year starting December 1 2023 (appointed for 1 year, and extended contingent on satisfactory progress).

Interested?

For more information, please contact Dr. Annemiek JM Cornelissen, e-mail: annemiek.cornelissen@u-paris.fr. Applications should be sent by email and include a CV and references' contact information relevant to your research or training.



The jellyfish Aurelia aurita and its gastrovascular canal network