

# Interview with Paul Villoutreix (LIS, Marseille, France)

## - Could you briefly describe your academic background and experience ?

My academic background is quite diverse. First, I was trained as an engineer in applied mathematics at Supélec (now CentraleSupélec). However, I had always been interested in academic research and was looking for opportunity when someone told me about an interdisciplinary master in life science (AIV Master at the CRI), which I decided to pursue in parallel to the last year of school. There I discovered a large freedom of thought, interacted with many international scientists and was able to follow my curiosity. This is during this year that I first took interest in the questions of embryogenesis.

I then started a PhD under the mentorship of Nadine Peyri ras and Giuseppe Longo entitled "Randomness during animal morphogenesis, a multiscale approach". It was a time of large academic freedom; my PhD combined applied math, developmental biology and epistemological approaches. I studied and established mathematical models to understand the dynamics of morphological variability in the development of the wild type sea urchin and of the zebrafish *squint* mutant line.

During the third year of my PhD, I got lucky and obtained funding to spend a semester at Stanford University in the Math Department, under the wise mentorship of Gunnar Carlsson, a specialist of applied algebraic topology. When I came back to France, I made the decision to return to the US and continue working on questions of fundamental science.

I met Stas Shvartsman at a Gordon conference in California and became postdoc in his team at Princeton University just after defending my PhD. This was an amazing time where I got to meet many of my personal science heroes and pursue research at the Lewis Sigler Institute for Integrative Genomics and at the math department. We investigated the mathematics of data science and their applications to questions of developmental biology. In addition, we successfully described the shape and transformations of the *Drosophila* Egg Chambers, this part was in close collaboration and friendship with then graduate student Jasmin Imran Alsous.

The program that brought me to Princeton was supported by the Weizmann Institute where I got to spend a year and a half. While discovering the complexities of life in the Middle East, I worked in Eli Zelzer's lab on fascinating questions of morphogenesis in the mouse skeletal system.

## - What led you to interdisciplinary research ?

I have always been fascinated by many fields of science and I think that I can easily change perspective on a topic, which is what we do when we pursue interdisciplinary research.

In addition, complex systems such as a developing embryo require joint efforts across many fields of science as they involve dynamics at various levels of organization (from molecules, to cells, to tissues, to organs). Interdisciplinarity is way of helping these communities communicate.

**- What led you to CENTURI ?**

CENTURI was launched when I was still a postdoc at the Weizmann Institute. The scientific aims were perfectly in line with my research, so I applied!

**- What are your first impressions about CENTURI ?**

CENTURI is an amazing initiative that brings the best out of so many researchers around Marseille. The conditions to start a group are exceptional in France and I get a lot of support from the staff of CENTURI as well as from the computer science department. This is much needed as interdisciplinary research can be seen as a bit risky and requires to convince a large number of researchers with very different backgrounds.