

Cells and humans bodies motion and self-organization in architected environments

Maxime Bonnefoy^{a,b,*}

- a. Laboratoire interdisciplinaire de Physique, CNRS – UGA Grenoble
- b. Digital RDL (research by design laboratory), CRESSON – AAU – UGA Grenoble

* bonnefoy.m@univ-grenoble-alpes.fr

I do this communication proposal for the mini-symposium « active fluids and crowd motions » as a PhD student working on a transdisciplinary research in architecture and biology, a research lead at two scales : cells behaviour is studied at the biological scale, and humans behaviour at the architectural scale. What links these two different fields is the intricate relations between a living being and its environment.

We aim to study how a pattern impacts the behaviour of the living beings, based upon three hypothesis: First, we forecast that the observation of the living beings motor expression allows us to identify and to qualify these living – environment links. Then we assume that these behaviours witness the living beings abilities and qualities to perceive their environment and to carry out associated actions. Finally, we propose that from these two scale observations we can establish criteria of how these environments may be qualified by the morphology.

The numerical transition in the midst of which our society is provides new processes useful in both biology and architecture: firstly, to design micro-environments substrates for the mechanical study of cells and secondly, to design and produce computationally complex morphologies. These technological are renewing research thinking toward a collaborative and fruitful work between the two disciplines. Architecture offers to the field of biology a new approach to morphologies and the way they are perceived and experienced (threshold perception, corporal appropriation of space...). In return biology provides to architecture a rigorous protocol to observe spontaneous and self-organising living beings.

As the PhD project started only few month ago, the purpose of this short contribution would be more about sharing ideas and concepts than presenting final results.

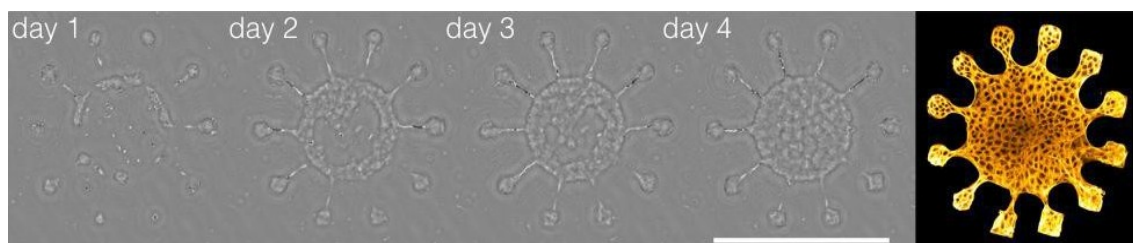


Figure 1 : Illustration of cell population dynamics in micro-architectures. Lenless microscopy give an unprecedented access to the dynamics of population of cells over days. Scale = 2mm.