SOCIÉTÉ CHIMIQUE DE GENÈVE

Patterning the vertebrate skin through mechanical and Turing instabilities

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Using our recent research results in non-model species of mammals and reptiles, I will show that some specific aspects of skin morphogenesis in vertebrates are emerging from reaction-diffusion (Turing) and mechanical instabilities. I will illustrate these concepts with three examples. First, I will show that skin thickness variation (generated by 3D morphogenesis) of skin scales in ocellated lizards (*Timon lepidus*) causes the underlying reaction–diffusion dynamics to separate into microscopic and mesoscopic spatial scales, the latter generating a cellular automaton that computes a colour pattern. Second, I will show that the intricate network of minuscule crevices on the skin of the African bush elephant (*Loxodonta africana*) are true fractures of the epidermis caused by local bending mechanical stress accumulating during its growth on a lattice of millimetric elevations. Third, I will discuss that mechanical forces, rather than genetic changes, are likely responsible for the development of robust folding sites of the spectacular ruff of the *Chlamydosaurus* lizard.

Conférence présentée le

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