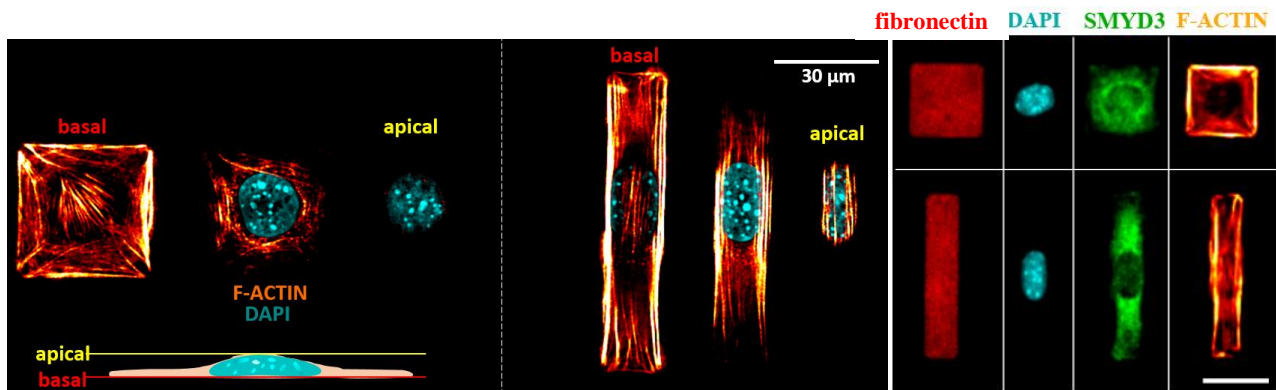


INTERNSHIP AND PHD PROPOSAL

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Shape, mechanical stress and cellular identity

We have recently shown that the nucleo-cytoplasmic distributions of many transcription factors and epigenetic factors, i.e. factors which determine the cell identity, depend on the shape of the cell: we controlled the shape of myoblasts (muscle precursors), by making them adhere to adhesion micro-patterns (see images below) and evidenced for instance that SMYD3, an epigenetic factor, is less nuclear when cells are rectangular than when they are square. The mechanical stress applied to the nucleus of rectangular cells by the "actin cap", a contractile acto-myosin structure which is absent for square cells (see images below "apical"), seems to play a central role in this phenomenon, as evidenced by its inhibition.



Myoblasts (muscle precursors) cultured on adhesive micro-patterns (in red : fibronectin) that determine their shape (Pereira, Richert, Medjkane, Hénon, Weitzman, *Scientific Reports*, to appear)

The aim of the internship is to study quantitatively this effect of cell shape on the localization of epigenetic factors.

The internship may be followed by a PhD on a more general subject dealing with the influence of mechanical and geometrical stresses on the identity of muscle cells.