

# Drunken sailors in *C. elegans* embryos: what shall we do with Wnt ligands ?

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Animal development is the result of spatially and temporally controlled signalling events. A cell or a group of cells within a tissue receives information about their position in the tissue and subsequently takes appropriate decisions about fate, function or migration. Wnt signalling is such a pathway that control anteroposterior and dorsoventral patterning of embryos across species. While lot is known about the genetic pathway and the expression pattern of Wnt, the mode of action at a distance of this ligand still remains elusive. For example it has been proposed that Wnt form a concentration gradient that instruct the fate or the proliferation of a cell according to the local concentration of the gradient. However the Wnt protein itself has never been observed live. We use *Caenorhabditis elegans* as a model system to adress this question. We developed with CRISPR/CAS9 technique new strains expressing fluorescently labeled versions of the Wnt ligand and its receptor Frizzled. We aim at explaining the spatiotemporal characteristics of the establishment of Wnt signaling. To do so we combine advanced microscopy techniques (Lattice Light Sheet microscopy, Fluorescence Correlation Spectroscopy, ...) and numerical simulations in order to decipher the interplay between extracellular diffusion of the ligand, interactions with its receptor and tissue dynamics.