How to turn an embryo into an Alien monster.

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The metacestode larval stage of the tapeworm *Echinococcus multilocularis* grows infiltratively, like cancer, into the inner organs of their intermediate hosts, thus causing the lethal disease alveolar echinococcosis. I herein explain how the parasite uses and modifies the three-dimensional body axis system that defines animal shape to achieve the metamorphosis of the invading oncosphere larva (the embryo) into the metacestode (the Alien monster). As typical for metazoans, tapeworms define their anterior-posterior body axis by releasing morphogens that activate (e.g. *wnt1*) or inhibit (e.g. *sfrp*) the canonical WNT signalling pathway. *E. multilocularis* is the only metazoan known so far that modifies this system to achieve asexual multiplication. Entering the host as an oncosphere that exhibits an anterio-posterior axis, the parasite then transiently shuts down the anterior pole, resulting in the infiltratively growing, completely posteriorized metacestode. After extensive multiplication towards the end of the infection, the anterior pole is then re-established thousand-fold within the massive metacestode tissue, which finally gives rise to numerous tapeworm heads (protoscoleces) that are passed on to the definitive host when it takes the prey. RNAi knockdown of beta-catenin, the central component of WNT signalling, or pharmacological intervention directed against the WNT pathway leads to general anteriorization of parasite cells and to complete failure of metacestode tissue production. WNT signalling is thus a highly promising target for the development of novel therapeutics against echinococcosis. The presentation will be concluded by presenting data and ideas on how the differential modulation of host immune responses through the parasite at early and late time points of the infection contribute, in turn, to parasite body axis modification. Altogether, the complex events contributing to form shaping of *Echinococcus* within the intermediate host are a fascinating example of how parasites exploit metazoan developmental plasticity to optimize their transmission to consecutive hosts during the life cycle.