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Differential Adhesion Hypothesis

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Synonyms

DAH

Definition

The Differential Adhesion Hypothesis (DAH) is a theory advanced by Steinberg (1962) to explain the mechanisms of *cell sorting*. The latter are in vitro observations, where mixed heterotypic cell aggregates sort out into homotypic clusters. The sorting proceeds via the coalescence of small clusters into larger ones until a complete de-mixing of cell types is achieved. The DAH postulates that, analogous to the de-mixing of immiscible fluids, *differences in the cell-type-specific strengths* of intercellular adhesion cause measurable tissue surface tensions which drive the sorting process to minimize these tensions. It predicts that round cell aggregates emerge where either the cell type with the highest homotypic intercellular adhesion is in the center of the aggregate and is surrounded by cells with lower homotypic intercellular adhesion or a serial arrangement of homotypic clusters arises. The DAH has been challenged both by experimental and theoretical works; for a review see Green (2008). By now, it is fairly generally excepted that differential adhesion causes cell sorting, although there is a recent debate on whether additional intercellular interactions could contribute to cell sorting and affect the final sorted pattern as well (Green 2008; Krieg et al. 2008; Voss-Boehme and Deutsch 2010).

References

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