

Morphogenesis and cancer: a view from a theory of organisms

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ABSTRACT

The tissue organization field theory (TOFT) posits that cancer is a tissue-based disease akin to development and morphogenesis, but gone awry. Carcinogens (directly) and mutations in the germ-line (indirectly) may alter normal interactions between the different tissue components of the morphogenetic field. These include the reciprocal interactions between stroma and adjacent epithelium in diverse stages of organ development.

The principles we postulated for the construction of a theory of organisms provide novel insight into normal and neoplastic development. Regarding the latter, carcinogens alter and relax the constraints that operate in tissues and in their constitutive cells. These induced architectural alterations, in turn, allow cells within tissues to regain their constitutive properties, that are, proliferation with variation and motility.

Because proliferation with variation and motility represent fundamental postulates or premises (i.e., the equivalent of inertia in physics) they do not require explanations. What require explanations are the constraints that limit the default states. This novel perspective makes useless the search for stimulators of proliferation (i.e., the so called growth factors) and of cellular movement and migration.

We will analyze experimental data obtained from this theoretical framework, including the normalization of “cancer cells” achieved when those so-called cancer cells are transplanted in the midst of normal tissues.