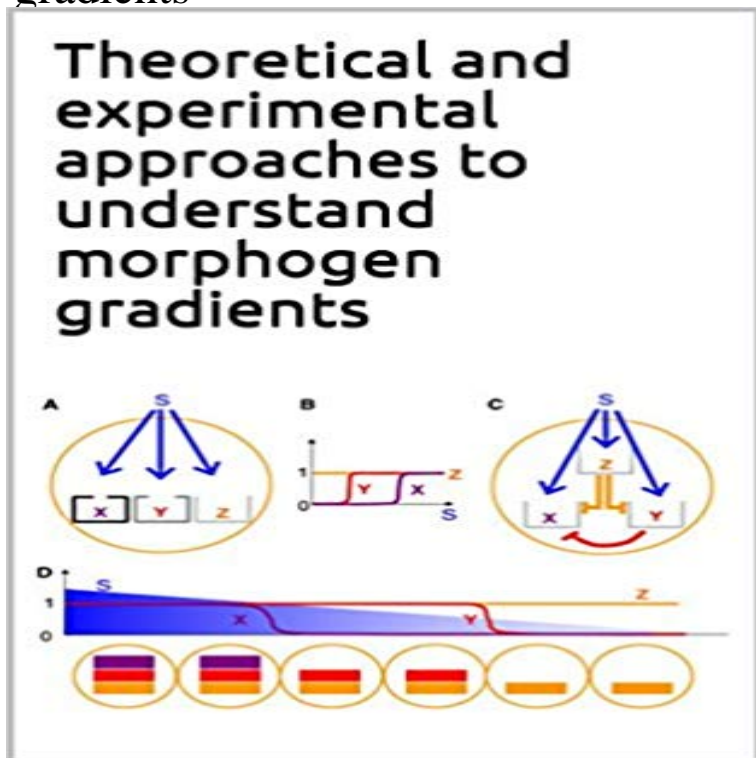


# Theoretical and experimental approaches to understand morphogen gradients



Morphogen gradients, which specify different fates for cells in a direct concentration-dependent manner, are a highly influential framework in which pattern formation processes in developmental biology can be characterized. A common analysis approach is combining experimental and theoretical strategies, thereby fostering relevant data on the dynamics and transduction of gradients. The mechanisms of morphogen transport and conversion from graded information to binary responses are some of the topics on which these combined strategies have shed light. Herein, we review these data, emphasizing, on the one hand, how theoretical approaches have been helpful and, on the other hand, how these have been combined with experimental strategies. In addition, we discuss those cases in which gradient formation and gradient interpretation at the molecular and/or cellular level may influence each other within a mutual feedback loop. To understand this interplay and the features it yields, it becomes essential to take system-level approaches that combine experimental and theoretical strategies.

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**Theoretical and experimental approaches to understand morphogen** Theoretical and experimental approaches to understand morphogen gradients. Marta Ibañes<sup>1</sup> and Juan Carlos Izpisua Belmonte<sup>2,3,\*</sup>. <sup>1</sup> Department of Estructura i

**Decoding the quantitative nature of TGF- $\beta$ /Smad signaling: Trends** This contends that tissue patterning is controlled by a concentration gradient Theoretical and experimental approaches to understand morphogen gradients.

**Theoretical and experimental approaches to understand morphogen** (A) The morphogen gradient elicits a signal

(S, in blue) to which a cell (orange) is exposed. Theoretical and experimental approaches to understand morphogen gradients. **The Role of Endocytosis during Morphogenetic Signaling** Morphogen gradients, positional information, and Xenopus: interplay of theory and experiment. The understanding of growth factor signal transduction has elucidated the focus of new interest at both the experimental and theoretical level. *Animals Body Patterning Cell Nucleus/metabolism Developmental Biology/methods* **Biologically Responsive Biomaterials for Tissue Engineering - Google Books Result** How morphogen gradients are formed in target tissues is a key question for understanding the Here, we review different mechanisms of morphogen gradient formation from theoretical and experimental points of view. First We then discuss the advantages and limitations of different experimental approaches to gradient **Theoretical and experimental approaches to understand morphogen** theoretical and experimental approaches to understand morphogenesis. temporally and variably changing conditions including morphogen gradients (Fig. **PDF (1 MB) - Cell theoretical descriptions of morphogen gradient formation - NCBI - NIH** Morphogen gradients have been an extremely useful framework to **Morphogen gradients, positional information, and Xenopus - NCBI** Mar 25, 2008 Theoretical and experimental approaches to understand morphogen gradients. Marta Ibanes, Juan Carlos Izpisua Belmonte. **Theoretical and experimental approaches to understand morphogen** Mar 25, 2008 Theoretical and experimental approaches to understand morphogen gradients. 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