

Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Pattern Scaling Achieved by Oppositely Directed Morphogen Gradients PETER MCHALE, UCSD, WOUTER-JAN RAPPEL, UCSD, HERBERT LEVINE, UCSD — Morphogens are proteins, often produced in a localised region, whose concentrations spatially demarcate regions of differing gene expression in developing embryos. The boundaries of expression must be set accurately and in proportion to the size L of the developing field; this cannot be accomplished by a single one-dimensional gradient. Here, we show how a pair of morphogens produced at opposite ends of a developing field can solve the pattern-scaling problem. In the most promising scenario, two morphogens interact according to $A + B \rightarrow \emptyset$ and the switch occurs according to the absolute concentration of the first gradient. In this case scaling occurs in a window of developing-field sizes centred at a few times the morphogen decay length.

Peter McHale
UCSD

Date submitted: 30 Nov 2005

Electronic form version 1.4