

# Adhesion-Dependent Wave Generation in Crawling Cells

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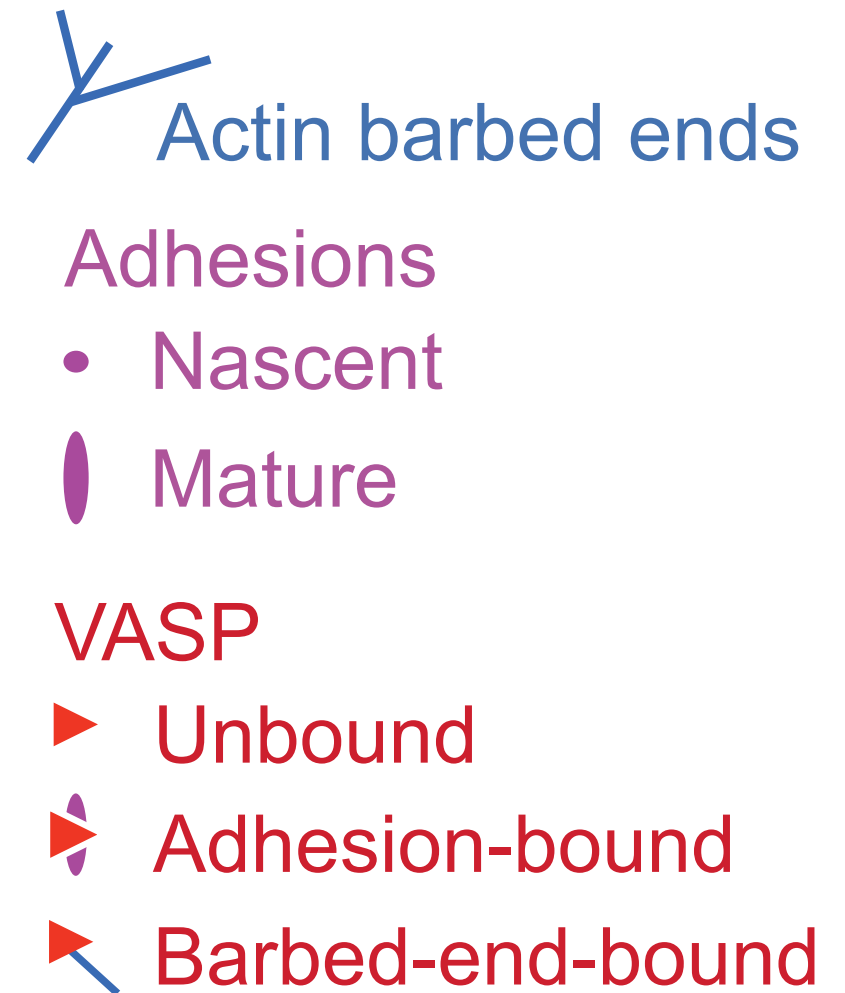
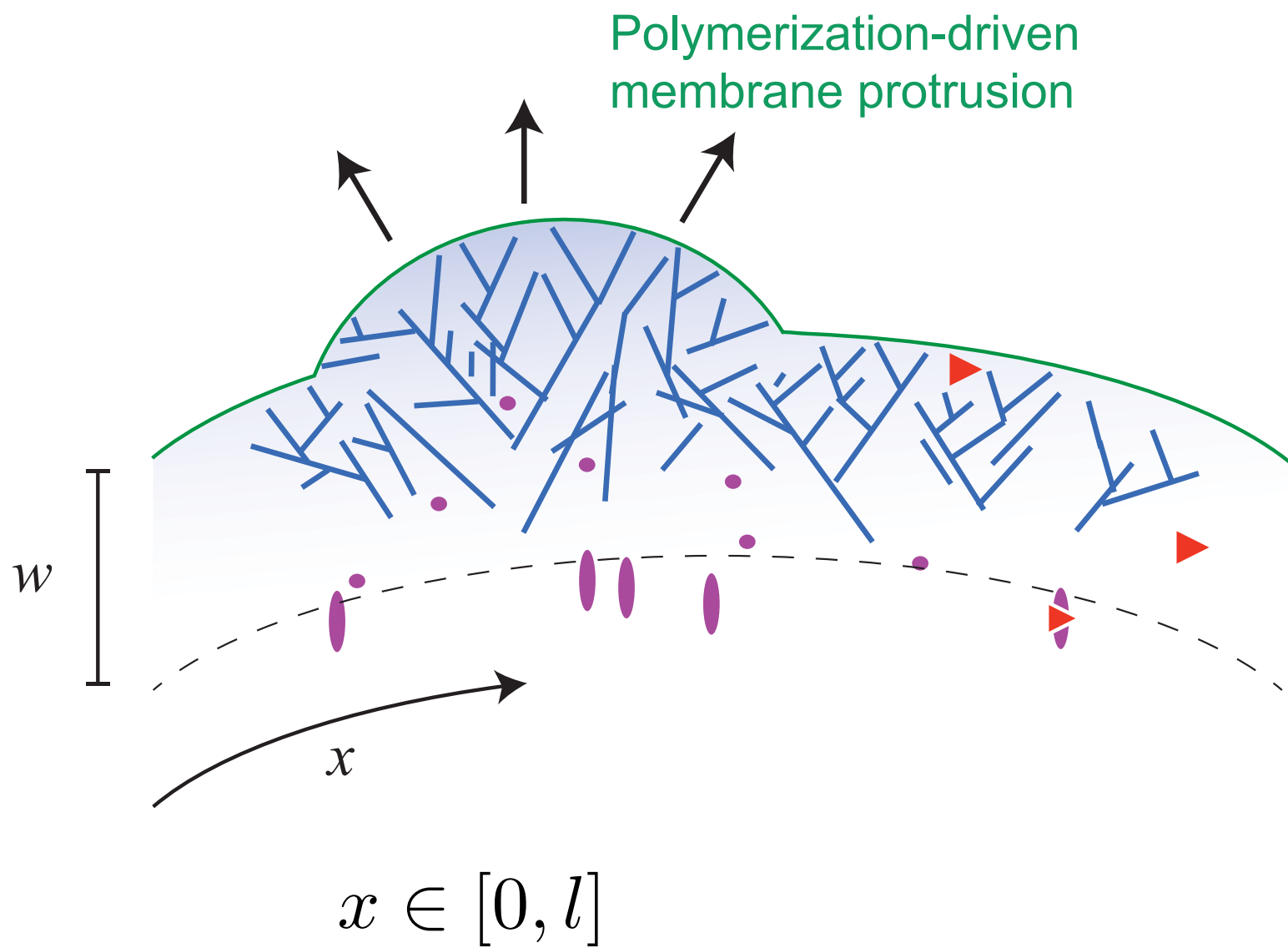
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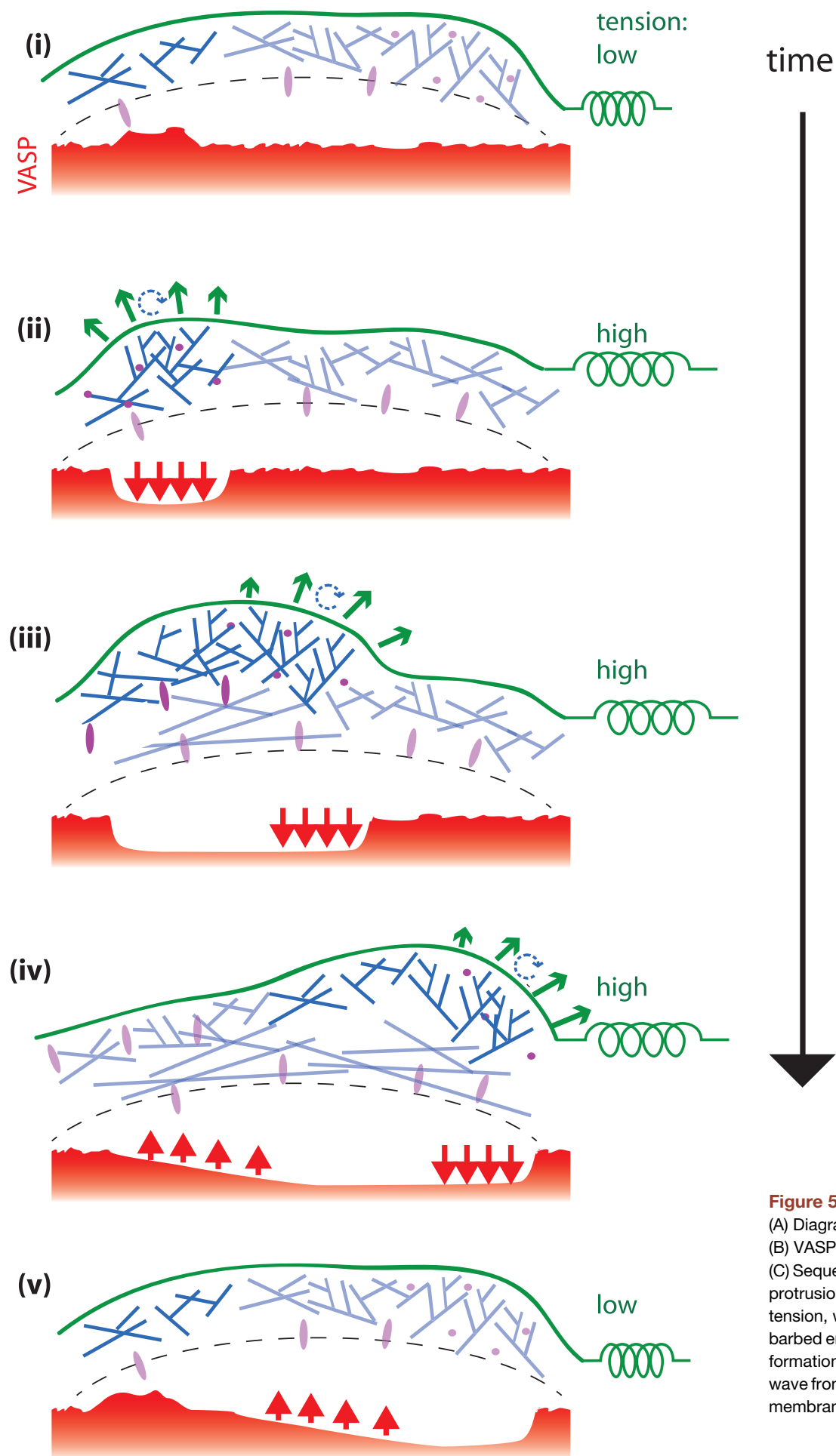
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**Figure 5. Model for Adhesion- and VASP-Dependent Traveling Wave Generation**

(A) Diagram depicting feedbacks among membrane protrusion, membrane tension, adhesions, and actin barbed ends.

(B) VASP molecules bind adhesions or actin barbed ends, or they diffuse in the cytosol.

(C) Sequence of events during waving. At stalled portions of the leading edge in waving cells, the accumulation of VASP increases the density of barbed ends until protrusion begins, triggering positive feedback between protrusion and the branching rate (parts i and ii). This increase in protrusion also increases membrane tension, which serves to prevent the initiation of protrusion at any other point along the leading edge, limiting the cell to a single protrusion. The lateral flow of barbed ends (due to the branched architecture of the actin network) causes protrusion to spread along the leading edge (parts ii–iv). Protrusion induces adhesion formation, resulting in the depletion of VASP from the leading edge (indicated by the red arrows in parts ii–iv) and the eventual termination of protrusion behind the wave front. Waves travel the length of the leading edge before extinguishing at the rear corners of the cell (parts iv and v). This is followed by a transient decrease in membrane tension, allowing a new wave to form at the site of initial protrusion where VASP has once again accumulated (part v).