All hippocampal and entorhinal subfields are active during theta oscillations. The phase relations suggest that oscillatory activity propagates over the slice in fixed sequence (EC → Sub → DG → CA3 → CA1). The propagation velocity is slower than axonal conductance, but faster than ionic diffusion (SD), suggesting that local synaptic circuitry is involved. Mathematical models suggest that synchronization emerges in a network of coupled oscillators with proper coupling (Ermentrout and Kopell 1984, 1994; Kopell 1988). Increasing bath K+ concentration (3.5 mM → 10 mM) increases the synchronization in the EC and the hippocampus.