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### **Dynamic Patterns in Active Fluids**

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Biological matter is inherently dynamic and exhibits active properties. A key example is the force generation by molecular motors in the cell cytoskeleton. Such active processes give rise to the generation of active mechanical stresses and spontaneous flows in gel-like cytoskeletal networks. Active material behaviors play a key role for the dynamics of cellular processes such as cell locomotion and cell division. We will discuss intracellular flow patterns that are created by active processes in the cell cortex. By combining theory with quantitative experiments we show that observed flow patterns result from profiles of active stress generation in the system. We will also consider the situation where active stress is regulated by a diffusing molecular species. In this case, spatial concentration patterns are generated by the interplay of stress regulation and self-generated flow fields.