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Generation and Evolution of Vascular Netowrks

Vascular networks are hierarchical structures essential for delivering oxygen and nutrients to tissues while removing waste from the body. The initial microvasculature plexus has no hierarchical organization. This immature network, characterized by high hydrodynamic energy dissipation, is inefficient for fulfilling the functions of a mature vascular network. We used a Branching Annihilating Random Walk process to generate the initial microvascular plexus and investigate the mechanisms by which this premature network evolves into a mature, and hierarchical system.