

Biology of Angiogenesis

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Angiogenesis is a key cellular event essential during growth and development. It involves in the growth of blood vessels by sprouting and intussusception. The interplay maintains a ratio in forming vessels. Shift in the balance leads to an unchecked vessel leads to vascular diseases. Formation of blood vessels follows two morphologically distinct patterns 1) Sprouting and 2) Intussusceptive angiogenesis. Sprouting angiogenesis is the formation of new blood vessel from pre-existing one. Intussusception, an alternative to sprouting mode of angiogenesis, is new blood vessel formation by splitting off existing ones. It is characterized by the

formation of intraluminal pillars within blood vessels and subsequently fuse, which result in vessel expansion and remodeling. The intussusceptive angiogenesis permits rapid expansion of the capillary plexus by creating a hierarchical tree that leads to modification of the branching geometry of supplying vessels. Our work shows that nitric oxide signaling leads to changes in the rate of sprouting and intussusceptive angiogenesis. We aim to elaborate the specific molecular mechanism of nitric oxide signaling in defining the ratio of sprouting and intussusceptive angiogenesis in health and diseases.