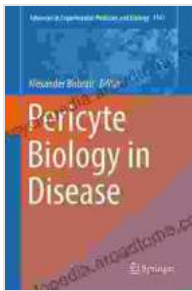


Unveiling the Therapeutic Potential of Pericytes in Disease: A Comprehensive Guide

Pericytes, once considered mere supporting cells for blood vessels, have emerged as crucial regulators of vascular function and tissue homeostasis. Their involvement in a wide range of pathological conditions, including cancer, cardiovascular disease, and neurological disorders, has sparked intense research interest in their therapeutic potential.



Pericyte Biology in Disease (Advances in Experimental Medicine and Biology Book 1147)

★★★★★ 5 out of 5

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Pericytes in Health and Disease

Angiogenesis: Pericytes play a vital role in angiogenesis, the formation of new blood vessels. They secrete pro-angiogenic and anti-angiogenic factors, regulate endothelial cell migration and proliferation, and stabilize newly formed vessels.

Neurovascular Coupling: Pericytes influence the blood flow to neurons, a process known as neurovascular coupling. They respond to neuronal

activity and adjust blood flow accordingly, ensuring adequate oxygen and nutrient supply to active brain regions.

Immune Regulation: Pericytes have immune-modulatory properties. They express MHC class II molecules and can present antigens to immune cells, facilitating immune surveillance. Additionally, they secrete cytokines and chemokines that regulate immune responses.

Pericytes in Disease: Role and Therapeutic Implications

Cancer: Pericytes are often found associated with tumor vasculature. They contribute to tumor angiogenesis, metastasis, and immunosuppression. Targeting pericytes could inhibit tumor growth and progression.

Cardiovascular Disease: Pericyte dysfunction is implicated in cardiovascular diseases, such as atherosclerosis and hypertension. Restoring pericyte function could improve vascular health and prevent disease progression.

Neurological Disorders: Pericyte abnormalities have been linked to neurodegenerative diseases, including Alzheimer's disease and Parkinson's disease. Enhancing pericyte function could promote neuronal survival and protect against neurological damage.

Emerging Therapeutic Strategies

Research efforts are focused on developing novel therapies that target pericytes. These strategies include:

- **Pericyte-targeting drugs:** Small molecules and antibodies that modulate pericyte function are being investigated for their therapeutic

potential in various diseases.

- **Pericyte-derived exosomes:** Exosomes released by pericytes contain bioactive molecules that may have therapeutic effects. Researchers are exploring the use of pericyte-derived exosomes for disease treatment.
- **Pericyte transplantation:** In certain conditions, transplanting healthy pericytes into damaged tissues could restore vascular function and promote tissue regeneration.

Pericyte biology holds immense promise for the development of novel therapeutic approaches for a range of diseases. Understanding their multifaceted roles in vascular function, neurovascular coupling, and immune regulation provides a foundation for targeting pericytes in disease management. Ongoing research efforts aim to translate this knowledge into effective therapies that improve patient outcomes.



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