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Review Article **Published Date:- 2025-05-30**

Microscopic Diagnostics and Mapping of Cytophysiological Effects of Reactive Oxygen Species during Microwave Exposure of Living Tissues

A specialized installation has been developed for microscopic study of the Reactive Oxygen Species (ROS) formation during microwave irradiation of biological samples with automated control / mechanized tube and real-time data acquisition. The above installation can be used in biomedical practice for: standardization or certification of the microwave sources; testing of the potential antioxidants that protect tissues from ROS-induced effects; testing fluorescent sensors for ROS; analysis of ROS localization and distribution in various tissues in order to establish specific pharmaco-physiotherapeutic and toxicological localizations of ROS in different topographic-anatomical zones. The paper pays special attention to the singlet oxygen produced by the samples upon microwave treatment, as a physiologically active and highly reactive agent.

Review Article **Published Date:- 2025-05-26**

Redefining Biotechnology for the Global South: The Role of Synthetic Biology and Computational Tools

Biotechnology has always played an important role in tackling global concerns, particularly in the Global South, where socioeconomic gaps sometimes stymie scientific progress. Recent advances in synthetic biology and computational technologies have the potential to revolutionize biotechnology in these locations. Synthetic biology allows for the creation and manipulation of biological systems, with promise applications in healthcare, agriculture, and environmental control. Computational methods such as machine learning and artificial intelligence help to optimize synthetic biology processes, enabling innovations that are suited to local requirements. The combination of these cutting-edge technologies with traditional biotechnological techniques has the potential to dramatically improve the Global South's ability to solve issues such as disease outbreaks, food security, and sustainable development. This abstract outline the critical intersections of synthetic biology and computational advancements and their potential to empower the Global South, highlighting the need for supportive policies and capacity-building initiatives to maximize their impact.

Short Review **Published Date:- 2025-01-31**

The Role of Mitochondria in Chronic Wound Healing (Mitotherapy): Signaling and Therapeutic Implications

Mitochondria are essential intracellular organelles that significantly influence various cellular processes, including metabolism, stress response, and cell fate. Their precise regulation is crucial for maintaining both organelle and cellular homeostasis. Wound healing is a complex, multifactorial process that relies on the coordinated actions of multiple cell types and numerous cellular mechanisms. Dysregulation in this process can lead to chronic wounds, which pose substantial challenges for healthcare systems and present limited treatment options due to their intricate pathogenesis. Recent research has increasingly focused on the role of mitochondria in wound healing, revealing their involvement in critical processes such as metabolism, apoptosis, and redox signaling. Mitochondrial dynamics play a vital role in wound healing by adapting to cellular demands and environmental cues. Moreover, mitophagy, the selective degradation of damaged mitochondria, is crucial for maintaining mitochondrial integrity and function during the healing process. Mitochondria are not only pivotal in energy production but also in calcium homeostasis and the generation of mitochondrial reactive oxygen species, which are essential for signaling during wound repair. As wound healing progresses through distinct yet overlapping stages mitochondria facilitate the energy demands of repair and contribute to cytoskeletal remodeling necessary for wound closure. Understanding the multifaceted roles of mitochondria in wound healing could lead to novel therapeutic approaches for chronic wounds. Future research should prioritize investigating mitochondrial dynamics and functions in human tissues to develop targeted strategies for enhancing wound healing outcomes.
