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Literature Review **Published Date:- 2025-03-21**

Deep Learning-Powered Genetic Insights for Elite Swimming Performance: Integrating DNA Markers, Physiological Biometrics and Performance Analytics

The integration of deep learning and genetic analysis has transformed the assessment of elite sports performance, particularly in competitive swimming. This study examines the fusion of deep learning techniques with DNA markers, physiological biometrics, and performance analytics to enhance the prediction and optimization of swimmer performance. A structured dataset comprising genetic sequences, physiological parameters, and biomechanical attributes was utilized to train a neural network model capable of categorizing swimmers based on genetic predisposition and athletic potential. The model achieved high classification accuracy, demonstrating a strong link between genetic markers, physiological traits, and competitive swimming outcomes. The findings emphasize the potential of AI-driven analytics in talent identification, customized training adaptations, and injury prevention. Furthermore, the study highlights the effectiveness of deep learning in analyzing complex genomic and physiological data to generate meaningful insights for performance enhancement. While the results validate the feasibility of using genetic and AI-based models for performance prediction, further studies are needed to broaden dataset diversity, integrate epigenetic influences, and test the model across varied athlete populations. This research contributes to the expanding field of AI-driven sports science and provides a solid foundation for incorporating genomics with deep learning to enhance elite athletic performance.

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

Exploring the Potential of Medicinal Plants in Bone Marrow Regeneration and Hematopoietic Stem Cell Therapy

Blood cell production through hematopoiesis within the bone marrow serves both to maintain blood equilibrium and to respond to tissue injury and infectious demands. Hematopoietic stem cell (HSC) therapy developments have revolutionized medical treatment approaches for anemia leukemia and bone marrow failure caused by chemotherapy or radiation exposure. The therapeutic compounds present in medicinal plants have traditionally supported blood health and researchers now understand these plants could help regenerate bone marrow tissue. The analysis investigates how phytochemicals affect HSC proliferation and differentiation while supporting HSC survival. The medicinal plants *Panax ginseng*, *Astragalus membranaceus,* and *Curcuma longa* receive special attention for their documented ability to enhance hematopoiesis in preclinical and clinical settings. This review examines the challenges that include standardization issues, toxicity concerns, and regulatory barriers alongside future perspectives about combining plant-based therapies with traditional treatments to improve bone marrow recovery and health results.
