REVIEW ARTICLE

BIOELECTRONICS IN HEALTHCARE: BRIDGING BIOLOGY AND ELECTRONICS

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ABSTRACT

Bioelectronic medicines (BEMs) use electrical impulses to modulate neural circuits and restore physiological function. This emerging field combines molecular medicine, neuroscience, engineering and computing to deliver precise and personalized therapies for chronic and complex disorders. Applications range from paralysis, diabetes and rheumatoid arthritis to hypertension and sensory deficits. By targeting specific neural pathways, BEMs reduce systemic side effects and improve treatment outcomes. Advances in miniaturization, biocompatible materials, and closed-loop systems have accelerated translation into clinical practice. With the potential to customize devices for individual needs, bioelectronic medicine offers a transformative approach to disease management and patient care.