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Advancements in the Development of Plant-Based Therapeutics for Chronic Diseases

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SUMMARY. Chronic diseases such as diabetes, cardiovascular diseases, and cancer are significant contributors to morbidity and mortality globally. Plant therapeutics has gained attention due to their potential to treat and alleviate symptoms of these diseases. The extensive array of phytochemicals present in medicinal plants, such as alkaloids, flavonoids, and terpenoids, has demonstrated anti-inflammatory, antioxidant, and anti-cancer activities. This mini-review reviews the latest developments in plant-based therapeutics, and how plant compounds deliver their positive effects through molecular mechanisms. The review also reviews how biotechnological advances can improve the efficacy and yield of plant-derived therapies. Although full of promise, several challenges confront the development of plant-based therapeutics, such as standardization, toxicity, and regulation. But clinical trials and research in recent years have proven the effectiveness of plant-derived compounds in the treatment of chronic diseases, suggesting a promising future for their application in combination with conventional treatment regimens. This review points to the need for continued efforts to fill the gaps and define the potential of plant-based compounds as a therapeutic agent for the treatment of chronic diseases further.

RESUMEN. Enfermedades crónicas como la diabetes, las enfermedades cardiovasculares y el cáncer contribuyen significativamente a la morbilidad y la mortalidad a nivel mundial. La terapia vegetal ha cobrado relevancia debido a su potencial para tratar y aliviar los síntomas de estas enfermedades. La amplia gama de fitoquímicos presentes en las plantas medicinales, como alcaloides, flavonoides y terpenoides, ha demostrado tener actividad antiinflamatoria, antioxidante y anticancerígena. Esta mini-revisión analiza los últimos avances en terapias vegetales y cómo los compuestos vegetales ejercen sus efectos positivos a través de mecanismos moleculares. La revisión también analiza cómo los avances biotecnológicos pueden mejorar la eficacia y el rendimiento de las terapias vegetales. Si bien son prometedoras, el desarrollo de terapias vegetales enfrenta varios desafíos, como la estandarización, la toxicidad y la regulación. Sin embargo, ensayos clínicos e investigaciones recientes han demostrado la eficacia de los compuestos vegetales en el tratamiento de enfermedades crónicas, lo que sugiere un futuro prometedor para su aplicación en combinación con regímenes de tratamiento convencionales. Esta revisión señala la necesidad de continuar los esfuerzos para llenar los vacíos y definir mejor el potencial de los compuestos de origen vegetal como agente terapéutico para el tratamiento de enfermedades crónicas.

KEYWORDS: biotechnological advancements, chronic diseases, clinical trials, phytochemicals, plant-based therapeutics,.

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