

# Nucleic Acid Polymer Complexes Transforming Neurological Disorder Therapy via Precision Medication Delivery

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## Abstract

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Abstract: Nucleic Acid Polymer Complexes (NAPCs) are emerging as a novel class of precision medicine delivery vehicles for neurological disorders. This review discusses the synthesis, characterization, and application of NAPCs in the treatment of Alzheimer's disease (AD) and Parkinson's disease (PD). NAPCs are formed by the electrostatic interaction between cationic polymers and anionic nucleic acids, resulting in stable, biocompatible, and biodegradable complexes. These complexes can encapsulate hydrophobic drugs, siRNAs, and other therapeutic agents, protecting them from degradation and enabling targeted delivery to the brain. The review highlights the potential of NAPCs to revolutionize therapy for conditions such as AD and PD, and discusses the challenges and future perspectives in this field.

Keywords: Nucleic Acid Polymer Complexes (NAPCs), Precision Medicine, Alzheimer's Disease (AD), Parkinson's Disease (PD), Drug Delivery, Neurological Disorders.

Introduction: Neurological disorders, such as Alzheimer's disease (AD) and Parkinson's disease (PD), are major public health concerns. The development of effective therapies for these conditions is a significant challenge. Precision medicine, which tailors treatment to individual patients based on their genetic, environmental, and lifestyle factors, offers a promising approach to improve outcomes. Nucleic acid polymer complexes (NAPCs) are emerging as a novel class of precision medicine delivery vehicles for neurological disorders. This review discusses the synthesis, characterization, and application of NAPCs in the treatment of AD and PD. NAPCs are formed by the electrostatic interaction between cationic polymers and anionic nucleic acids, resulting in stable, biocompatible, and biodegradable complexes. These complexes can encapsulate hydrophobic drugs, siRNAs, and other therapeutic agents, protecting them from degradation and enabling targeted delivery to the brain. The review highlights the potential of NAPCs to revolutionize therapy for conditions such as AD and PD, and discusses the challenges and future perspectives in this field.

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Conclusion: NAPCs represent a promising platform for precision medicine delivery in neurological disorders. Further research is needed to optimize the design and application of NAPCs for clinical use.

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