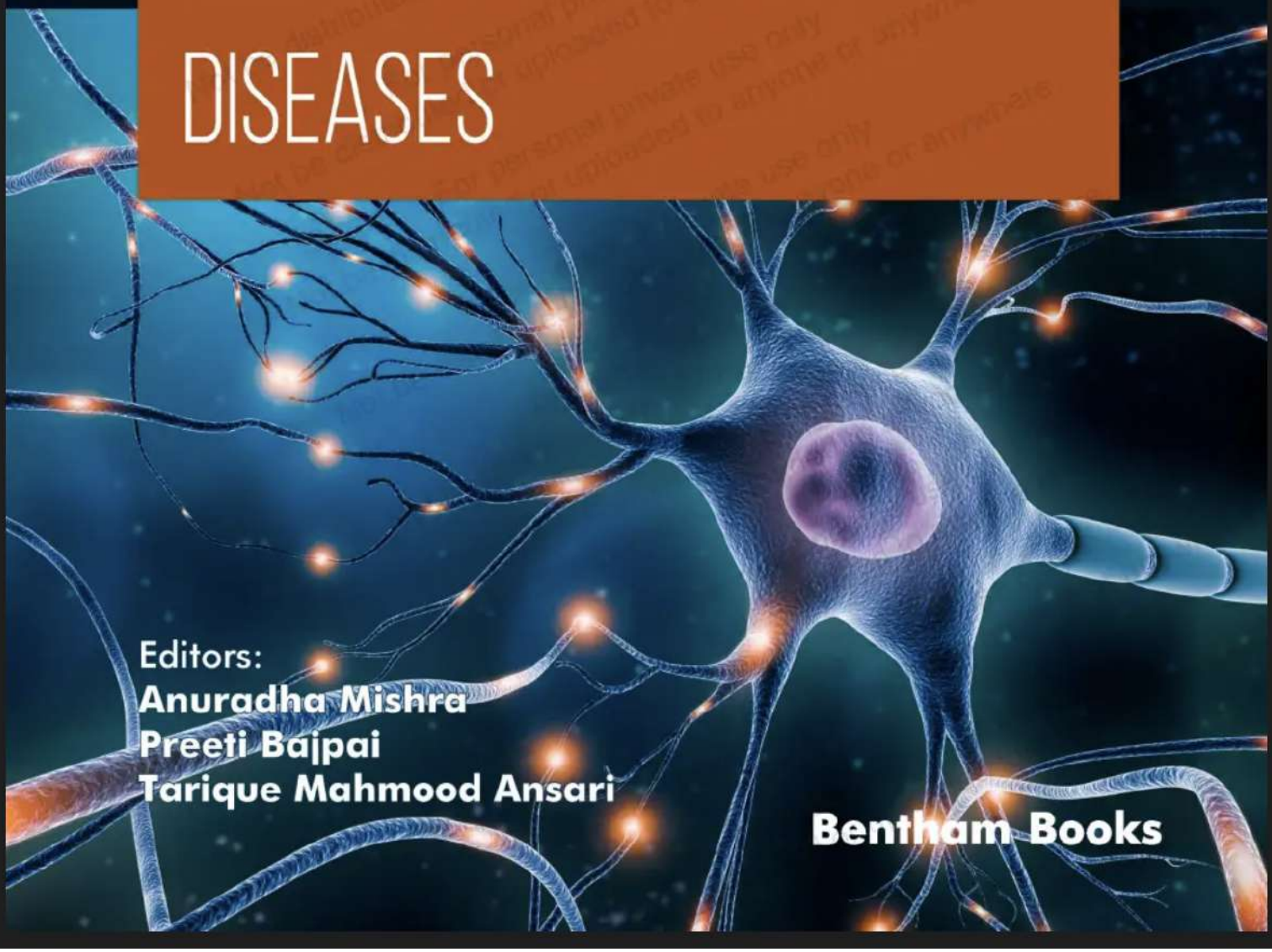
ADVANCES IN DIAGNOSTICS AND IMMUNOTHERAPEUTICS FOR NEURODEGENERATIVE DISEASES



Editors:
Anuradha Mishra
Preeti Bajpai
Tarique Mahmood Ansari

Bentham Books

CHAPTER 8

Epigenetics as Diagnostic and Therapeutic Tool in Neurodegenerative Disorders

Rufaida Wasim[1,*], Tarique Mahmood[1], Farogh Ahsan[1], Aditya Singh[1] and Asad Ahmad[1]

[1] *Department of Pharmacy, Integral University, Lucknow, India-226026*

Abstract: Epigenetics is a field that is concerned with the investigation of heritable modifications in gene expression that transpire without DNA sequence alterations, thereby establishing a connection between the genome and its surroundings. Epigenetics simply analyzes gene expression amendment beyond variation to the DNA sequence. The gradual accumulation of epigenetic changes over the course of an individual's life span may contribute to neurodegeneration. This chapter deals with epigenetic alteration, which affects the progress of neurodegeneration with age. Epigenetic regulation, encompassing DNA methylation and histone modification, has been implicated in the anomalous alterations in gene expression that occur during the progression of neurodegeneration. The concept of epigenetics is useful to synthesize novel medications to target these disorders. In recent times, a plethora of epigenetics-based medications have been developed for the treatment of neurodegenerative diseases such as Alzheimer's, Parkinson's, and Huntington's. Due to a major lack of early screening processes that allow therapeutic agents to be distributed to afflicted neurons paramount to cell death, many neurological conditions have severely restricted options for treatment. Significant progress has been seen in neurodegenerative disease biomarkers. These biomarkers have been unfortunate, due to substantial disparities amidst the tissues acclimated to source biomarkers and biomarkers of disease. Neurodegeneration may be exacerbated by epigenetic changes that develop gradually. Epigenetic biomarkers could aid in the diagnosis, and monitoring, of neurodegenerative diseases.

Keywords: Diagnosis, Epigenetics, Neurodegenerative disorders, Treatment.

INTRODUCTION

Neurodegenerative disorders pose an enormous challenge and represent some of the most severe health problems that societies will face around the world. These are progressive and incurable conditions, which arise from the continuous degene-

* **Corresponding author Rufaida Wasim:** Department of Pharmacy, Integral University, Lucknow, India; E-mail: rufaidawasim08@gmail.com

Anuradha Mishra, Preeti Bajpai, and Tarique Mahmood Ansari (Eds.)