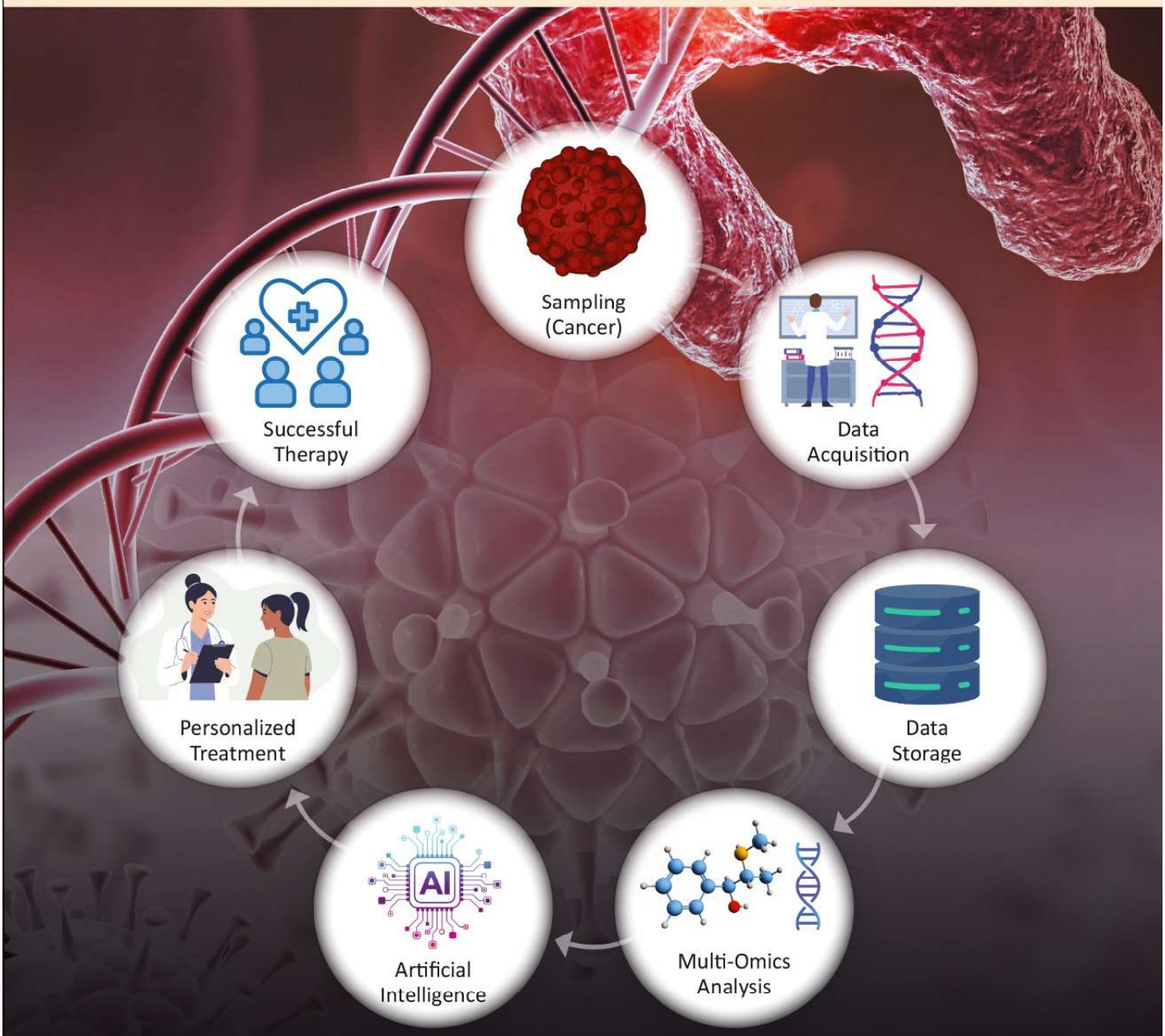
PERSONALIZED CANCER MEDICINE THROUGH MULTIOMICS



Edited by
Mohammad Azhar Aziz
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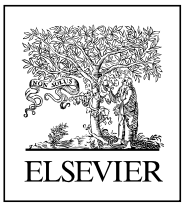
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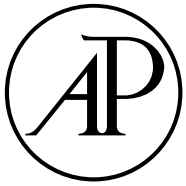
PERSONALIZED CANCER MEDICINE THROUGH MULTIOMICS

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Dedication

To cancer patients and their caregivers

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CHAPTER 12

Multiomics for an individual patient: Relevance and possibilities

Shom Prakash Kushwaha[a], Syed Misbahul Hasan[a], Arun Kumar[a], Akash Ved[b], Kuldeep Singh[a], Abdul Hafeez[a], Poonam Kushwaha[a], Shweta Singh[c], Manisha Pandey[d], and Bidhyut Dubey[e]

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1 Introduction

Precision medicine has turned attention away from universal treatment paradigms and toward those that take into consideration each patient's distinctive molecular profile (Friedman et al., 2015). This shift is especially important in oncology, where responses to therapy may be highly varied depending on genetic mutations, signaling pathways, epigenetic control, and tumor–host interactions. The convergence of multiomics analysis and integration of information from genomics, transcriptomics, proteomics, metabolomics, and other omics layers represents a strong tool to unravel cancer at an individual level (He et al., 2023). In contrast to single-omic approaches, multiomics represents the tumor biology from a multidimensional perspective, facilitating a better understanding of disease mechanisms, precise prognosis, and highly personalized treatment regimens (Raufaste-Cazavieille et al., 2022).

This chapter delves into the clinical potential and relevance of multiomics for the individual cancer patient. It underscores how the integration of heterologous molecular data enhances diagnostic accuracy, treatment choice, and outcome assessment. Through the analysis of existing tools, applications, case illustrations, and upcoming trends, we shall underscore how multiomics is revolutionizing cancer treatment from empiric to genuinely individualized treatment choices.

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