# Chapter 5
# Artificial Intelligence and the Contributions of Nanotechnology to the Biomedical Sector

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## ABSTRACT

*The application of an emerging technology called nanotechnology has had a strong development in various fields of human knowledge. Bio nanotechnology is one of the most recent evolutions of science with important contributions to the field of health, especially to precision medicine, so this chapter aims to highlight and discuss the main scientific findings on bionanotechnology applied to precision medicine. To do this, this chapter reviews the treatment of various diseases such as cancer, osteoarticular pathologies, cardiovascular diseases, neurological diseases, lung diseases, fungi such as Candida albicans, viruses such as Zica, Ebola, Dengue, and Sars-Cov2, with important advances such as more effective and less invasive treatments. These results coincide with the purpose of precision medicine, which brings together efforts to improve prevention, favoring prognosis.*

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# 1. INTRODUCTION

## 1.1 Contributions of Artificial Intelligence to the Biomedical Sector

Informatics provides methods, algorithms, and tools that discover new insights from highly complex data combined with human interaction in interdisciplinary work and effective use of data through an artificial neural network for learning models that make up artificial intelligence. In machine learning devices facilitate the approach to clinical situations after data creation, recognition, processing, interpretation, classification, storage, and retrieval (Combi et al., 2016; Miller & Brown, 2018).

AI is driven by electronic data and complex data management in devices that favor the implementation of interventions that seek to improve healthcare in technology-enabled procedures with savings in healthcare expenses that could be avoided due to poor adherence to treatment.

Researchers proposed the concept of systems biomedicine by integrating the fields of biosciences and medicine with informatics (Kalis et al., 2018) in predictive algorithms or mathematical models with linear logistic regressions, decision trees, and deep neural networks in mobile and interconnected devices that collect and they store data (Love-Koh et al., 2018; Topol, 2019).

The increasing volume of information about people in different healthcare contexts is driving increased data delivery across healthcare systems in centers managing genomic datasets and other disciplines applying mobile imaging technologies, real-time digital records, or large biodata banks with algorithmic support for medical images in a wide range of devices.

In the 2000s, the AI paradigm evolved through free-form modeling of the mammalian visual cortex, technical advances, and faster hardware that makes it possible to train neural networks in layers of feature detectors in datasets and deep learning models using online speech recognition. Android devices contribute to Google, Facebook, Microsoft, Apple, and Amazon business processes in social processes, (Kalis et al., 2018) that enhance machine learning and cognitive, deep, and reinforcement processes by integrating and interpreting datasets of different scenarios (Hu et al., 2020; Pham et al., 2017).

In 2017, the US Food and Drug Administration (FDA) stated that rigorous data safety and reliability must be ensured through processes that ensure systems are up-to-date and subject to safe use (Becker, 2019). In this way, learning is increased to support decision-making at the system level.

Representational machine learning includes a set of methods where raw data is fed into the machine and detects representations, so the perceptron is a biologically inspired algorithm that performs binary classification and extracts features through machine-based learning. It combines life sciences, medicine, and informatics into a holistic approach that includes humans, disease, drug discovery, and healthcare.

Since the topic is related to the different processes that affect people's health in different contexts, the objective of the work was to promote the practical application of AI as a potential health tool. Build new knowledge that enables mechanisms that encourage the use of the media to generate changes in the way of doing health through actions with technological support and artificial intelligence.

### 1.1.1 Potential Applications of Artificial Intelligence in Health

Most of the selected documents show interest in the possible applications of AI in health and the use of data through algorithms thanks to the support of technologies (information, communication, computing, computing); Unfortunately, there are few easy-to-develop applications, and most of them prevail in