

**CHENNAI – PONDICHERRY**

**Learning for Personalised Medicine: A Comprehensive Review from Deep Learning Perspective**

**Abstract**

With the recent advancements in analysing high volume, complex and unstructured data, modern learning methods are playing an increasingly critical role in the field of personalised medicine. Personalised medicine, which refers to providing tailored medical treatment to individual patients through the identification of common features, including their genetics, inheritance, and lifestyle, has attracted the attention of many researchers over the recent years. This review paper provides an overview of the research progress in application of learning methods with the focus on deep learning in personalised medicine. In particular, three domains of applications are reviewed, including drug development, disease characteristics identification, and therapeutics effect prediction. The main objective of this survey is to consider the applied methods in detail and to offer insights into their pros and cons. Although having demonstrated advantages in coping with data complexity and nonlinearity, and in recognising features and associating structural data, the studied learning methods are not a panacea to all the medical problems. Hence, we discuss the existing research challenges and clarify the future study directions.