ML has been used in:

• Analyses of points or bins from the metabolomics measurements such as NMR spectra or MS spectrograms (examples of use of PCA and PLS methods are too many to reference). A recent example of an application of deep learning, as well as SVM, RF and several other machine learning algorithms was presented by Alakwaa et al. [20];

• Assignment of peaks in spectrograms or spectra for metabolite identification [12,21];

• Quantification of metabolite concentrations from high throughput data [22,23];

• Selection of a sets of the most informative attributes ("feature selection") for given sample groups [19,24];

- ML can be used to optimise and discover metabolic pathways within the body

- Dataset contains 29 distinct features that describe several patients' statuses with a total of 12,012 records
    - 5 nature-inspired algorithms are used to obtain relevant features
    - Variety of data points:
        - Enzyme test
        - Insulin Test
        - Age, Gender, Demographic data
        - Triglyceride levels
        - More
- To get accuracy, true vs false pos/negs were counted
- Very close relationship between immunity and metabolic health
- KNN was the best model

- Datasets were collected from variety of nomics data, lots of preprocessing was necessary for feature selection and getting rid of garbage points
- Classification models like SVM and random forests, regression models, and Neural Nets were used
    - Neural Nets:
        - **Autoencoders** were used to generate compact representations of data
- In addition to just using the models, "light grey box" methods can be used, in which certain data points are manually inputted into network and then the effects are examined
    - More hands-on approach

- Diabetes is extremely prevalent today
- CNN model used to analyse mouth and determine diabetes risk

Obesity
- 4 groups of metabolites were obtained with all appeared in obesity patients
- K-means and two-step were the 2 models used in the study
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