

Identifying antibiotic resistant bacteria from DNA

antibiotic resistant

In this model , you will learn how to train machine learning models for predicting antibiotic resistance in bacteria.

We will be focussing on a species called *Neisseria gonorrhoeae*, the bacteria which cause gonorrhoea. Gonorrhoea is the second most common sexually transmitted infection (STI) in Europe, after chlamydia. Rates of gonorrhoea infection are on the rise, with a 26% increase reported from 2017-2018 in the UK.

Many people who are infected (especially women) experience no symptoms, helping the disease to spread. If the infection is left untreated, it can lead to infertility in women, and can occasionally spread to other parts of the body such as your joints, heart valves, brain or spinal cord.

Resistance of these bacteria to antibiotics is rising over time, making infections hard to treat. Below, you can see rates of resistance to different antibiotics. Image is from this paper: <https://www.mdpi.com/2079-6382/7/3/60>.

In the past, patients were treated with an antibiotic called ciprofloxacin. Doctors had to stop using this antibiotic because resistance to the drug became too common, causing treatments of infections to fail. Until very recently, the recommended treatment was two drugs - ceftriaxone and azithromycin. Azithromycin was removed from recommendations because of concern over rising resistance to the antibiotic. In February 2018, the first ever reported case of resistance to treatment with ceftriaxone and azithromycin, as well as resistance to the last-resort treatment spectinomycin, was reported. Currently in the UK, patients are only treated with ceftriaxone.

In this notebook, we will look at machine learning algorithms for predicting resistance to azithromycin.

For this work, we will be using scikit learn (or sklearn) a lot. This is a very popular python package for building machine learning models. More information on what you can do with scikit learn can be found here: <https://scikit-learn.org/stable/>

Examples of what other people have done with scikit learn can be found here: https://scikit-learn.org/stable/auto_examples/index.html

Repository URL: <https://www.kaggle.com/code/nwheeler443/identifying-antibiotic-resistant-bacteria-from-dna>

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Accuracy: 96