Covid-19 – is the answer in our genes?

A research team led by the University of Edinburgh suggests that our genetic code could predict the severity of Covid-19 in patients.

They will look at the genetic blueprints of those who have Covid-19 and who are severely ill. They think that this will help them find out why the disease affects some more seriously than others. The team also hope that it will lead to finding possible treatments for the disease.

This is a UK-wide programme and it will sequence the whole genomes – the genetic code – of the patients in a bid to find the specific genes that cause a predisposition to the disease.

The project is led by Dr Kenneth Baillie from the University of Edinburgh, and is a collaboration between Genomics England, the NHS, and the GenOMICC (Genetics of Susceptibility and Mortality in Critical Care) consortium – a global collaboration to study genetics in critical illness.

This new partnership will allow whole genome sequencing, involving up to 20,000 people who are either at present or have previously been in ICU as a result of coronavirus. But it will also involve 15,000 people who only display mild symptoms.

GenOMICC – which was launched by Dr Baillie in 2016 – is already active in more 170 intensive care units across the UK and has signed up more than one thousand patients for the

study.

The team aim to recruit every Covid-19 patient on a ventilator in the UK. The group have now been funded to sequence the entire genomes of patients with Covid-19 in collaboration with Genomics England and Illumina.

The project hopes to explain one of the biggest mysteries about COVID-19: why some people get no symptoms at all, while others become critically ill, or die.

The scientists hope that by finding out why some people are predisposed to developing life-threatening symptoms, they will then be able to identify treatments for clinical trials and perhaps highlight those of us who could be at extreme risk.

The study's results will also inform global strategic planning for possible later waves of Covid-19 and for other pandemics in the future.

GenOMICC is an open, global consortium of intensive care clinicians to understand genetic factors that influence outcomes in intensive care from diseases such as SARS, influenza and sepsis. It is designed to enable rapid research in the event of outbreaks like the current pandemic.

GenOMICC is funded by the charity Sepsis Research (FEAT), the Intensive Care Society, Wellcome, UKRI and Scotland's Chief Scientist Office.

This new work has been enabled by £28 million of funding from Genomics England, UK Research and Innovation, the Department of Health and Social Care and the National Institute for Health Research.

Rt Hon Matt Hancock, the Secretary of State for Health, said: "I am delighted to be announcing this further major programme in the UK's fight against Covid-19. As a nation we are determined to harness the UK's leadership in genomics to

understand its role in viral response and whether we can use this information to identify those at greatest risk and improve their treatment."

Dr Kenneth Baillie, the project's chief investigator and Academic Consultant in Critical Care Medicine and Senior Research Fellow at University of Edinburgh's Roslin Institute, said: "Our genes play a role in determining who becomes desperately sick with infections like Covid-19. Understanding these genes will help us to choose treatments for clinical trials. The GenOMICC study was launched before this outbreak and it is recruiting in 145 ICUs across the country with tremendous support from the critical care community. We are excited to work with Genomics England to tackle this new and complex disease."

Sir Mark Caulfield, Chief Scientist at Genomics England, said: "For the first time in a generation we face a global viral pandemic that is life threatening for some people, yet others have a mild infection. By reading the whole genome we may able to identify variation that affects response to Covid-19 and discover new therapies that could reduce harm, save lives and even prevent future outbreaks."