

# Gene expression signature to diagnose multiple infectious & inflammatory diseases in children

A gene expression signature capable of simultaneously detecting 18 different infectious and inflammatory diseases in children that present with similar symptoms.

## Proposed use

Simultaneous diagnosis of multiple diseases in children by detecting the expression levels of 161 genes in RNA from patient blood samples.

- Infectious diseases: bacterial infection, viral infection, malaria, tuberculosis
- Inflammatory diseases: Kawasaki disease

## Problem addressed

Fever is a prevalent symptom in children with various infectious and inflammatory diseases. Precise and prompt diagnosis is crucial for effective treatment and management. Diagnosing febrile patients requires evaluating multiple potential diseases simultaneously. However, existing diagnostic tests are binary. For the first time we show that with a single set of genes we can identify the cause of fever and inflammation out of 18 different classes.

## Technology overview

Using a machine learning approach and incorporating clinical consequence of misdiagnosis as a “cost” weighing, we found that we could measure the expression levels of a 161 genes in RNA from a patient's blood to distinguish diverse infectious and inflammatory diseases.

## Intellectual property information

A GB priority application was filed on 23rd March 2023

## Link to published paper(s)

<https://pubmed.ncbi.nlm.nih.gov/37597512/>

## Inventor information

The inventors of the IP are Prof Mike Levin, Dr Myrsini Kaforou, Dr Dominic Coote, Dr Jethro Herberg and Dr Aubrey Cunnington.

## Benefits

- Multi-class transcriptomic signature
- Simultaneous diagnosis of 18 different diseases in children
- Timely diagnosis
- Rapid diagnosis

Dr Rachel Spruce

Industry Partnerships and  
Commercialisation Executive, Faculty of  
Medicine

e: [r.spruce@imperial.ac.uk](mailto:r.spruce@imperial.ac.uk)

t: +44 (0)754 330 4076

Technology reference: **11335**