

## MicroRNA Biomarkers for ectopic or intrauterine pregnancy

### Summary

MicroRNA are single stranded, non-coding, 19-25 nucleotide molecules which regulate messenger RNA stability and transcription. They are important gene regulators and their expression profiles change with pathophysiology, allowing them to be used as biomarkers. The research team have focussed on microRNA expression in pregnancy of unknown location (PUL), a pregnancy classification which clinically precedes confirmation of either ectopic pregnancy (EP) or intrauterine pregnancy [viable (VIUP), or non-viable (NVIUP)]. They have identified differential markers that can serve to distinguish these early pregnancy outcomes.

### Technology

Significant microRNA markers have been identified that are upregulated in EP and NVIUP compared to VIUP. These are easily measured and identifiable by taking blood from patients with a PUL and processed to allow specific microRNA marker quantification. The inventors will use the presence of microRNA targets to differentiate outcome in PUL and therefore allow prediction and early diagnosis of EP and NVIUP in patients, reducing the risk of clinical complication as a result of delaying necessary treatment.

### Applications

This invention improves the ability to accurately predict early pregnancy location and viability, either independently or in combination with other biomarkers within a risk model. Outcome confirmation prior to visualisation of the pregnancy on trans-vaginal ultrasound (TVUS) would significantly improve current best clinical practice. The ability to predict is required by patients and medical professionals in early pregnancy managing PUL and EP as, whilst improving patient safety, an opportunity is created to standardise early pregnancy care in an area that is managed with variation around the world. Early treatment of EP reduces the need for surgical management, reducing salpingectomies and preventing the associated impact to future patient fertility.

### Intellectual property

The invention is covered by a patent application No. PCT/GB2020/050324

### Benefits

- No current accurate and standardized predictor of EP, VIUP or NVIUP available as a biomarker.
- Use of microRNA biomarkers will allow early prediction to differentiate patients who have an EP or a NVIUP (miscarriage).
- Can potentially be used independently or within risk stratification models for patients with PUL, improving outcome prediction.

Neringa Barmute  
Industry Partnerships and  
Commercialisation Executive,  
Faculty of Medicine  
E: [n.barmute@imperial.ac.uk](mailto:n.barmute@imperial.ac.uk)  
T: ++44 (0)20 7594 6866  
W: [www.imperial.ac.uk/enterprise](http://www.imperial.ac.uk/enterprise)  
Technology reference: 10439