



**UNSW**  
SYDNEY



## Artificial Intelligence (AI)-Empowered Biomedicine

**The AI-empowered biomedicine laboratory develops cutting-edge innovative AI and machine-learning methodologies to integrate and interpret large-scale molecular and clinical data to promote personalised medicine and precision therapy.**

### Competitive advantage

- Multidisciplinary expertise and cross-faculty collaborations
- Developing advanced machine-learning methods and deep-learning models that leverage large omics data

### Impact

- Improving translational genomics and personalised medicine
- Facilitating tailored treatment and precision therapy
- Reducing the cost and timeframe of drug development
- Reducing the risk of type 2 diabetes
- Developing downloadable/online toolkits reusable in different clinical settings

### Successful outcomes

- Discovery of circulating microRNA markers of colorectal cancer prognosis
- Identification of diagnostic non-coding RNAs in ovarian tumour microenvironment associated with metastasis
- Identification of exosomal microRNA biomarkers for non-invasive glioblastoma diagnosis
- ExomiR signatures of disease status in multiple sclerosis
- Network-based drug repositioning led to identification of less-toxic cancer treatment drugs
- Prediction of functional noncoding variants in human brain genome (in progress)
- Comprehensive databases on mammalian cellular interactions
- Development of computational tools and software for biomarker discovery and drug repurposing

### Capabilities and facilities

- High-Performance Computing (HPC) resources for model development
- Access to Australia's largest genomics facilities with state-of-the-art next-generation sequencing technologies
- Highly multidisciplinary research network enabling translation of the research outcomes

### Our partners

- Nutromics Pty Ltd
- BCAL Diagnostics
- Royal Prince Alfred Hospital

### More Information

Dr Fatameh Vafaee

School of Biotechnology and  
Biomolecular Sciences

T: +61 2 9385 3281

E: [f.vafaee@unsw.edu.au](mailto:f.vafaee@unsw.edu.au)

UNSW Knowledge Exchange

[knowledge.exchange@unsw.edu.au](mailto:knowledge.exchange@unsw.edu.au)

[www.capabilities.unsw.edu.au](http://www.capabilities.unsw.edu.au)

+61 (2) 9385 5008