PhD Research Scholarship Opportunity

Nanorobots for Cancer Detection, Diagnosis and Drug Delivery

Project description

This 3.5-year PhD research scholarship is generously supported by the CSIRO Next Generation Artificial Intelligence and Emerging Technologies Graduates Program.

CSIRO has awarded $10.9 million to 12 research training programs led by universities around Australia. Funding is aimed at solving real-world challenges with Artificial Intelligence (AI). NanoCube Health is an industry partner in one of the programs, "AI Enabled Advanced Materials Technology", together with the Deakin University, Australian National University and CSIRO.

Around 18 million global citizens are diagnosed with cancer annually with $1.16 trillion spent on cancer globally each year. More than ever, nanorobots have great potential to redefine the approach we take to early detect and treat diseases like cancer and beyond. Nanorobots can both improve health outcomes and reduce the financial burden of disease.

The recipient of this prestigious scholarship will play a pivotal role in advancing the project to its final stage of materials discovery and design validation, leveraging the power of Artificial Intelligence and Machine Learning.

Key activities include:

- Conduct a literature review / in-depth research to build a strong foundation of knowledge in the field of nanorobotics, with a strong emphasis on consumer-centric, impact-driven MedTech design.
- Alongside industry partner, contribute to planning of consumer (and other stakeholder) engagement to inform design decision-making and ensure a strong consumer-centric focus.
- Finalise the nanorobotics design and externally validate the concept using Artificial Intelligence and Machine Learning. This includes collecting, analysing, and interpreting data using appropriate statistical or computational methods.
- Undertake testing and characterisation activities.
- Optimise the overall design at each stage of the project by identifying and addressing design flaws, evaluating different design iterations, validating design choices and ensuring the final design meets the desired specifications and objectives.
- Collaborate with a range of stakeholders both inter-departmentally at Deakin University and with external industry partners including NanoCube Health and CSIRO.
- Contribute to overall project management, including timeline planning, effective communication and coordination with team members, risk assessment and management, resource management, and ensuring the successful execution of the research project to an exemplary standard in collaboration with the research team and industry partner.

Key Outcomes

- **Transform cancer theranostics – safer, efficacious, timely and low-cost**
    - *Safer* by improving patient safety and wellbeing, and reducing cancer-related mortality and morbidity
    - Efficacious by offering greater accuracy of theranostic capabilities
    - *Timely* including earlier diagnosis, and reduced time in surgery and recovery.
    - *Low-cost* from manufacturing, in use, through to disposal phase, while maintaining critical performance criteria.
- **Better health** through
    - Early diagnosis and treatment
    - Positive change to patients' health status, functional status and quality of life.
- **Improve patients' experience** and **satisfaction**
    - Minimally invasive treatment, including greater comfort in recovery
    - Reduction of side effects through targeted treatment
    - Reduction of psychosocial issues exacerbated by existing treatment options
- In the longer term, **overall reduction to healthcare costs.**

About YOU

You will have:

- **Australian citizenship or residency** in accordance with funding requirements
- A Bachelor's degree with Honours OR Master's degree in **biochemical engineering**, **biomedical engineering or a related field**
- Exceptional analytical and problem-solving abilities
- Strong written and verbal communication skills, including strong collaboration skills
- Excellent time management and organisational abilities, including the ability to be self-motivated and to work autonomously
- Ability to ensure confidential and sensitive information is managed discreetly and securely.

You may have:

- Qualification in computer science and/or machine learning
- Experience in machine learning, computational materials science, data analytics/modelling or similar
- Advanced proficiency with Python.

NanoCube Health is committed to diversity and inclusion. We welcome applications from people from various backgrounds including First Nations people, women, members of the LGBTIQ+ community and people with disabilities.

Contact us at info@nanocube.com.au