



# Position Description

<b>JOB TITLE:</b>	Computational Biology Research Officer
<b>GROUP:</b>	Computational Drug Discovery Biology Group
<b>TEAM:</b>	Therapeutic Innovation (THINK)
<b>REPORTS TO (TITLE):</b>	Group Leader Therapeutic Innovation
<b>LAST DATE REVIEWED:</b>	10 March 2022

---

## JOB SUMMARY

No targeted drug therapies exist for most common paediatric cancers. And the few targeted therapies available have mostly been developed for adult cancers, yet the mechanisms driving paediatric and adult cancers are usually different. Consequently, the only treatment option for many children is chemotherapies, which are harsh, unspecific and more harmful. For this role we are looking for a highly motivated and talented computational biologist to identify new vulnerabilities specific to paediatric oncology and support the discovery of new drugs targeting those vulnerabilities.

You will join the THINK (THERapeutic INnovations for Kids) program, the only drug discovery research initiative in Australia focused solely on developing new and more effective treatments for children with cancer. Building on over 10 years of experience in high-throughput drug screening at Children's Cancer Institute, THINK has established a target-to-clinical trials drug discovery capability focused on discovering new tailored treatments for children and adolescents who have no available targeted therapies to treat their cancer.

To inform your research, you will have access to the data generated by the Zero Childhood Cancer (ZERO) Program, a national child cancer precision medicine program led by Children's Cancer Institute, and Kids Cancer Centre, Sydney Children's Hospital, to identify individual cancer therapy for children, adolescents, and young adults with high-risk cancer where the expected survival rate is less than 30%. This program is about to be expanded to include all children with cancer in Australia, irrespective of their risk group. The objective of the program is to prolong survival and reduce treatment side effects. The data generated by ZERO is globally unique for paediatric cancer.

ZERO is generating vast amounts of genomic, transcriptomic and epigenetic data alongside drug efficacy data from in vitro laboratory screening and PDX models, and critically the clinical data for individual patients. In addition to informing treatment recommendations today, this data can (and must) be used to invent solutions for the future, to generate new knowledge, new basic and translational research insights, and develop new cancer therapies for those children who have no current options for treatment.

We are seeking a Research Officer to join the newly formed computational drug discovery biology group within THINK dedicated to 1) mining the wealth of existing genetic and biological information, including ZERO, to identify new drug discovery targets for THINK, and 2) accelerate the discovery and development of new drugs once targets enter the THINK pipeline.

The Research Officer Therapeutic Innovation will be responsible for intersecting internal and external information in order to propose new biological targets for paediatric oncology. The successful candidate will be an independent, highly motivated, and talented researcher, with a passion for conducting high quality research in the area of



# Position Description

computational biology applied to therapeutic innovation in paediatric oncology. This discovery research project will predominantly develop methods to identify and highlight under- or unexplored dependencies in paediatric oncology. This will be achieved by mining data from preclinical functional genomics screens (e.g., paediatric dependency map, or internal) with primary clinical characterisation from ZERO. They will work closely with other members of the Drug Discovery, Translational Biology and Computational Biology Groups to support the development, and delivery of a target identification platform aimed at building capacity, knowledge, and expertise across institute research staff in computational drug discovery.

## PRIMARY TASKS / RESPONSIBILITIES

*In fulfilling the core strategic objectives of the group, the role will be engaged in the following duties and responsibilities:*

- Leverage high dimensional data to propose new targets or treatments specific to paediatric oncology
- Develop cutting-edge bioinformatics and AI methods to advance drug discovery. In particular:
  - Working closely with the Translational Biology group using Cas13 functional screening to validate and explain novel vulnerabilities
  - Working with the Drug Discovery group to interpret and maximize Compound Screening (HTS, HCS, etc...) results
  - Proposing novel approaches to leverage existing datasets for the purpose of target identification or compound repurposing
- Discover and validate biomarkers of response to targeted perturbations specific to paediatric indications.
- Staying abreast on advances in genomics and next generation sequencing technology in general, maintaining knowledge about drug discovery and translational biology.
- Develop and apply tools to combine biological data sets with 'omic and perturbation data sets to better integrate, manipulate, and interpret a child's multi-'omics tumour profile and vulnerabilities (genome, transcriptome, biology)
- Be motivated to seek academic career progression opportunities through driving manuscript writing, grant writing and presenting research and conferences.
- Support the Computational Drug Discovery Biology group / Therapeutic Innovation and collaborators with paper writing, and grant writing
- Day-to-day support and occasional training of students and junior staff as required.
- Promote CCI on the local, national, and international stages
- Other duties as assigned.

### **Key Interactions:**

- Internal: Computational Drug Discovery Biology Group Leader, Director of Therapeutic Innovation, Translational Biology Group Leader, Head of Research Computing, Group and Team Leaders, reporting of research activities, and others as required
- External: Key external collaborators where research is or will be undertaken, presentations at local and international conferences

## MINIMUM REQUIREMENTS

### **Qualifications**

- PhD in computational biology, genomics, or related field



# Position Description

## Experience and requirements

- Highly developed skills in bioinformatics and genomics
- High-level of proficiency in bash, R, and python
- Strong demonstrated expertise working with multiple next generation sequencing methods
- Experience developing modularised analysis pipelines which operate in a commercial or academic cloud environments are desirable
- Ability to develop, manage and maintain internal and external relationships, including collaborations
- Expertise in developing (probabilistic) deep learning algorithm is desirable
- Expertise in cancer biology is desirable
- Experience working with functional genomics data is desirable but not essential
- Experience in mRNA biology and dynamic modelling is desirable but not essential
- Highly motivated to produce high quality outcomes in pursuit of translational excellence

## KEY SKILLS

- Strong analytical, critical thinking, and problem-solving skills
- Creativity, flexibility and independence as a researcher
- Capacity to manage multiple priorities and projects with excellent organisational and time management skills
- Able supervision of staff and students
- Capacity to work under minimal supervision
- Exceptional written and oral presentation skills
- Exceptional project management skills
- Exceptional interpersonal skills and ability to work cooperatively, openly, and transparently

## EXPECTED OUTPUTS

- Perform high quality bioinformatics research, resulting in the development of novel methods, biological insights, and a combination of methods-led, and disease-led research papers
- Contribution towards grant writing, paper writing, and scientific communication, including preparing and delivering internal and external presentations
- Assist with the design, implementation, and maintenance, and actively contribute to an ongoing training program for non-bioinformaticians
- Development and maintenance of strong collaborative links to leverage and contribute to international data sets

*NOTE: It is not the intention of the Position Profile to limit the scope, outcome or activities of the position but to highlight the most important aspects of the position. The aspects mentioned above may be altered in accordance with the changing requirements of the role.*