



## POSITION DESCRIPTION

<b>Position Title:</b>	Biochemist
<b>Cluster / Business Unit / Division</b>	Nuclear Science and Technology
<b>Section or Unit:</b>	National Deuteration Facility
<b>Classification:</b>	Band 6 / Band 7 (Linked)
<b>Job Family:</b>	Research
<b>Position Description Number:</b>	PD-2447
<b>Work Contract Type:</b>	Professional
<b>STEMM/NON-STEMM:</b>	STEMM
<b>STEMM CATEGORY:</b>	Research

### POSITION PURPOSE

This position will contribute to the establishment of synthetic biology capability at the NDF for engineering of new biosynthetic pathways to enable the production, purification and characterisation of organic molecules labelled with stable isotopes (2H, 13C, 15N). The position will utilise microbial genomes in design-build-test-learn cycles to produce new candidate molecules and provide scale-up production and purification capability.

### ORGANISATIONAL ENVIRONMENT

ANSTO leverages great science to deliver big outcomes. We partner with scientists and engineers and apply new technologies to provide real-world benefits. Our work improves human health, saves lives, builds our industries and protects the environment. ANSTO is the home of Australia's most significant landmark and national infrastructure for research. Thousands of scientists from industry and academia benefit from gaining access to state-of-the-art instruments every year.

Nuclear Science & Technology (NST) incorporates ANSTO's research, innovation, landmark research infrastructure and associated platforms and capabilities. NST conducts research and development in relation to nuclear science and technology and connects people, transfers knowledge, and provides nuclear-based products and services for the benefit of Australia.

The National Deuteration Facility (NDF) is Australia's national facility for isotopic labelling of molecules with the stable, non-radioactive isotope deuterium using chemical or biological processes in order to enhance contrast, and reduce background when conducting structural studies using neutron scattering instrument operated by the Australian Centre for Neutron Scattering at the OPAL Reactor, or using spectroscopic techniques such as Nuclear Magnetic Resonance (NMR), Infra-Red (IR) or Mass Spectrometry (MS).

The NDF is a world leader in chemical deuteration and equal to the benchmark for Biodeuteration. It is the only facility of its kind in southern hemisphere and has an oversubscribed user program with greater than 100 users per year from 25 institutions benefitting from the NDF's capabilities. The NDF has significant international engagement with institutions in Europe, Asia and the U.S.A.

### ACCOUNTABILITIES & RESPONSIBILITIES

#### Key Accountabilities – Band 6

- Contribute to the establishment of new protocols for production and purification of stable isotope labelled lipids and other molecules using synthetic biology principles.
- Perform genome mining to identify genes for development of new biosynthetic pathways and bioproduct synthesis.

- Use screening techniques to develop microbial strains for efficient production of stable isotope labelled molecules.
- Develop expression and purification protocols for supply of stable isotope labelled molecules.
- Perform sequencing and data analysis to characterise new microbial strains, providing a library of candidate strains for new target molecules.
- Develop small scale expression and purification protocols and perform scale-up production and purification for supply of labelled molecules to customers.
- Contribution to journal and conference publications including authorship on papers.
- Responsibility for the operation and maintenance of instruments as assigned, including training of other staff in their use.
- Contribute to grant applications for funding of research activities.
- Undertake additional duties as required and during periods of leave of other staff.

### **Key Accountabilities – Band 7**

- Initiate, undertake and contribute to internal and external research investigations and projects that utilise synthetic biology for the production of stable isotope labelled molecules, and establish and build networks within Australian and international research community, in order to enhance the NDF's capabilities, reputation and increase demand.
- Perform genome mining to identify genes for development of new biosynthetic pathways and bioproduct synthesis.
- Use robotics and micro-bioreactor screening techniques with design-build-test-learn cycles to develop strains for efficient production of labelled molecules.
- Perform in-depth sequencing and data analysis to characterise new microbial strains, providing a library of candidate strains for new target molecules.
- Develop small scale expression and purification protocols and perform scale-up production and purification for supply of labelled molecules to customers.
- Establish networks with external researchers undertaking investigations that would benefit from the use of stable isotope labelled molecules.
- Supervise research students and provide expertise in the use of instruments and protocols.
- Prepare and publish journal papers (including being a lead author) describing application of synthetic biology in production and characterisation of stable isotope labelled molecules and method development.
- Develop and lead grant applications for funding of research activities.
- Undertake additional duties as required and during periods of leave of other staff.

### **Decision Making**

The position holder will be responsible for part or all of the laboratory work required to produce stable isotope labelled molecules and in this context will:

- Design (or contribute to design), discuss, and reach agreement with the NDF Leader on approaches to the labelling and synthesis of specific molecules in NDF proposals.
- Determine key work priorities within the context of agreed weekly and monthly work plans and consult with the NDF Leader on complex or major technical or methodological issues that have a significant impact on completion of NDF proposals for molecular labelling.
- Be fully accountable for the accuracy and quality of experimental results provided to the NDF Leader, and ensure that day to day decisions on laboratory work are based on sound evidence for which the role holder at times may be required to make effective judgements under pressure or in the absence of complete information or expert advice.

- Band 6 role: Make decisions on the design of biosynthesis for the production of stable isotope labelled molecules.
- Band 7 role: Make decisions on the development of new biosynthetic pathways, strains and/or cell-free systems for the production of stable isotope labelled molecules, and design of purification protocols.
- The levels of authority delegated to this position are those approved and issued by the Chief Executive Officer. All delegations will be in line with the ANSTO Delegation Manual AS-1682 (as amended or replaced).

### Key Challenges

- Research and develop new target systems for biosynthetic production of purified stable isotope labelled molecules.
- Conversion of technical success in isotopic labelling into high value outcomes including journal publications of high quality.
- Working closely with colleagues in the facility to provide the knowledge and skills transfer of established production techniques.
- Keeping abreast of recent developments in the field, ensuring the NDF continues to operate as the world-leading deuteration facility.
- Development of a distinctive and unique national and international profile in this field.

### KEY RELATIONSHIPS

Who	Purpose
<b>Internal</b>	
NDF Leader	<ul style="list-style-type: none"> <li>• Receive guidance and direction.</li> <li>• Recommend and gain endorsement for plans and goals and other initiatives.</li> <li>• Report on progress of NDF deuteration proposals.</li> <li>• Provide expert, authoritative and evidence-based information and advice on safety and quality aspects of the NDF's operations.</li> </ul>
NDF team members	<ul style="list-style-type: none"> <li>• Provide expert advice and analysis on a full range of matters.</li> <li>• Contribute to group decision making processes, planning and goals.</li> <li>• Collaborate and share accountability.</li> <li>• Negotiate and resolve conflicts.</li> </ul>
ANSTO Scientists & facility users	<ul style="list-style-type: none"> <li>• Provide advice and analysis.</li> <li>• Collaborate and contribute to research projects.</li> <li>• Understand user requirements and desired outcomes.</li> <li>• Provide training, guidance &amp; supervision while utilising facilities.</li> </ul>
<b>External</b>	
Facility users and collaborators from University, public and commercial R&D sectors	<ul style="list-style-type: none"> <li>• Build &amp; maintain relationships and stimulate interest in deuteration and in the research community.</li> <li>• Provide advice and analysis.</li> <li>• Collaborate and contribute to research projects.</li> <li>• Understand user requirements and desired outcomes.</li> <li>• Provide training, guidance &amp; supervision while utilising facilities, ensure compliance with safety, quality and applicable legislation and regulations.</li> <li>• Collaborate to deliver client focused results and provide scientific expertise.</li> </ul>

## POSITION DIMENSIONS

Staff Data	
Reporting Line	Reports to the Leader, NDF
Direct Reports	Nil
Indirect Reports	Nil

  

Financial Data (2023/2024)	
Revenue / Grants	N/A
Operating Budget	N/A
Staffing Budget	N/A
Capital Budget	N/A
Assets	N/A

  

Special / Physical Requirements	
Location:	Lucas Heights Working in different areas of designated site/campus as needed
Travel:	May be required travel to ANSTO sites from time to time Travel both internationally and nationally
Physical:	Office based physical requirements (sitting, standing, minimal manual handling, movement around office and site, extended hours working at computer) Standing for long periods doing laboratory work Public speaking Wearing personal protective equipment for the handling of hazardous and/or radioactive materials
Radiation areas:	May be required to work in radiation areas under tightly regulated conditions
Hours:	Willingness to work extended and varied hours based on operational requirements
Clearance requirements:	Satisfy ANSTO Security and Medical clearance requirements Obtain and maintain appropriate federal government clearance

  

Workplace Health & Safety
Specific role/s as specified in <a href="#">AP- 2362</a> of the ANSTO WHS Management System

## ORGANISATIONAL CHART

Refer to published Organisational Chart

## KNOWLEDGE, SKILLS AND EXPERIENCE

### Essential

1. PhD with 1-3 years post-doc experience (Band 6) in Biochemistry, Microbial Metabolic Engineering, Synthetic Biology, or a related field.
2. In-depth knowledge of Microbial Biochemistry, Genetics, Metabolism, and Physiology.

3. Demonstrated experience with heterologous expression systems from yeast and other microorganisms or cell-free systems.
4. Excellent oral and written communication skills including the ability to organise/present technical information, publish in leading journals, and at conferences.
5. Demonstrated interpersonal skills including the ability to collaborate with a diverse interdisciplinary research team.

**Desirable**

6. PhD with 4-10 years post-doc experience (Band 7) in Biochemistry, Microbial Metabolic Engineering, Synthetic Biology, organic chemistry synthesis and scale-up production/purification.
7. Experience in development of new (bio)synthetic molecules and bioprocessing for scale-up production/characterisation of purified molecules.
8. Experience in lipids biosynthesis, purification and scale-up production.
9. Experience in enzyme kinetics/characterization and small molecule purification/analysis.
10. Demonstrated research leadership and publication track record in biochemical synthesis.

**Linked Role Transition**

Transition to the higher Band within the linked role is not automatic and ability to perform Band 7 accountabilities will need to be demonstrated and assessed. This can be done by completing the attached form and completing a full written submission demonstrating and justifying how an employee meets the transition requirements.

**VERIFICATION**

This section verifies that the line manager and appropriate senior manager/executive confirm that this is a true and accurate reflection of the position.

<b>Line Manager</b>		<b>Delegated Authority</b>	
Name:	Tamim Darwish	Name:	Andrew Peele
Title:	Leader, NDF	Title:	Group Executive - NST
Signature:		Signature:	
Date:		Date:	

## Appendix 1

<b>ANSTO Job Families</b>
Accounting & Finance
Administration
Communications & Marketing
Compliance & Regulation
Engineering and Technical
Human Resources
ICT & Digital Solutions
Information & Knowledge Management
Legal
Manufacturing
Monitoring & Audit
Operations
Organisational Leadership
Project & Program
Research
Science
Security & Intelligence
Senior Executive
Service Delivery
Strategic Policy
Trades & Labour

**Biochemist Linked Role (PD-2447)  
Band 6 to Band 7 Transition Checklist**

Name:	
Commencement Date:	
Assessment Date:	

**Note: Full written submission demonstrating and justifying how the employee meets the requirements must also be attached.**

Requirements for transition	Met Criteria
a) Minimum 5 years post doctoral work as Synthetic Biologist OR b) Minimum 5 years equivalent experience	<input type="checkbox"/> Yes <input type="checkbox"/> No OR <input type="checkbox"/> Yes <input type="checkbox"/> No
PhD in Biochemistry or equivalent	<input type="checkbox"/> Yes <input type="checkbox"/> No
Extensive experience in genome engineering and adaptive laboratory evolution, sequencing and data analysis and scale-up production, and demonstrate meeting all below requirements	<input type="checkbox"/> Yes <input type="checkbox"/> No
Undertake Band 6 accountabilities at a technical expert level and independently without supervision or guidance	<input type="checkbox"/> Yes <input type="checkbox"/> No
Initiate, undertake and contribute to internal and external research investigations and projects that utilise synthetic biology for the production of deuterated molecules, and establish and build networks within Australian and international research community, in order to enhance the NDF's capabilities, reputation and increase demand	<input type="checkbox"/> Yes <input type="checkbox"/> No
Perform adaptive laboratory evolution, sequencing and data analysis to produce new strains/systems for expression of novel biomolecule targets for stable isotope labelling	<input type="checkbox"/> Yes <input type="checkbox"/> No
Develop small scale expression and purification protocols and perform scale-up production and purification for supply of labelled molecules to customers	<input type="checkbox"/> Yes <input type="checkbox"/> No
Contribute to in-house, collaborative and NDF-user research projects requiring production of deuterated molecules (using chemical processes) for structural investigations.	<input type="checkbox"/> Yes <input type="checkbox"/> No
Establish networks with external researchers undertaking investigations that would benefit from the use of deuterated molecules and be responsible for self-determined contribution of nuclear science and technology to those investigations.	<input type="checkbox"/> Yes <input type="checkbox"/> No
Prepare and publish journal papers (including being a lead author) describing application of synthetic biology in production and characterisation of deuterated and deuteration method development	
Promotion of teamwork, knowledge sharing, collaborative and user focussed working environment	<input type="checkbox"/> Yes <input type="checkbox"/> No
Supervise research students and provide expertise in the use of synthetic biology instruments and protocols	<input type="checkbox"/> Yes <input type="checkbox"/> No

**Attach written submission demonstrating and justifying how the employee meets each of the above requirements.**

**Manager Recommendation**

I have reviewed the employee's competence in accordance with Linked Role PD-2447 and certify that the employee meets all requirements for transition and recommend transition from Band 6 to Band 7 be endorsed.

Manager Name:	
Signature:	
Date:	

**Leader, NDF**

I have reviewed all information and approve transition from Band 6 to Band 7.

Name & Title:			
Signature:		Date:	