



NCIC Report

Nov 2022

The National Centre for Infections and Cancer. NHMRC CRE App #  
1116876, NHMRC Synergy grant#2011100

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**Preamble:**

There is compelling evidence that infection in cancer patients remains a leading cause of death and a significant cost to the healthcare system. No group is systemically addressing this problem in Australia nor is it addressed in national cancer strategies.

**This Synergy program aims to:**

1. Establish a national infrastructure for cancer specific infection surveillance.
2. Nationally implement life saving and harm minimising clinical care pathways.
3. Introduce innovative technologies to support the detection of and improve care of infections.
4. Build workforce capacity in infections and

cancer

**Purpose:**

The purpose of this report is to provide feedback on Synergy activities to date and to outline progress towards sustainability.

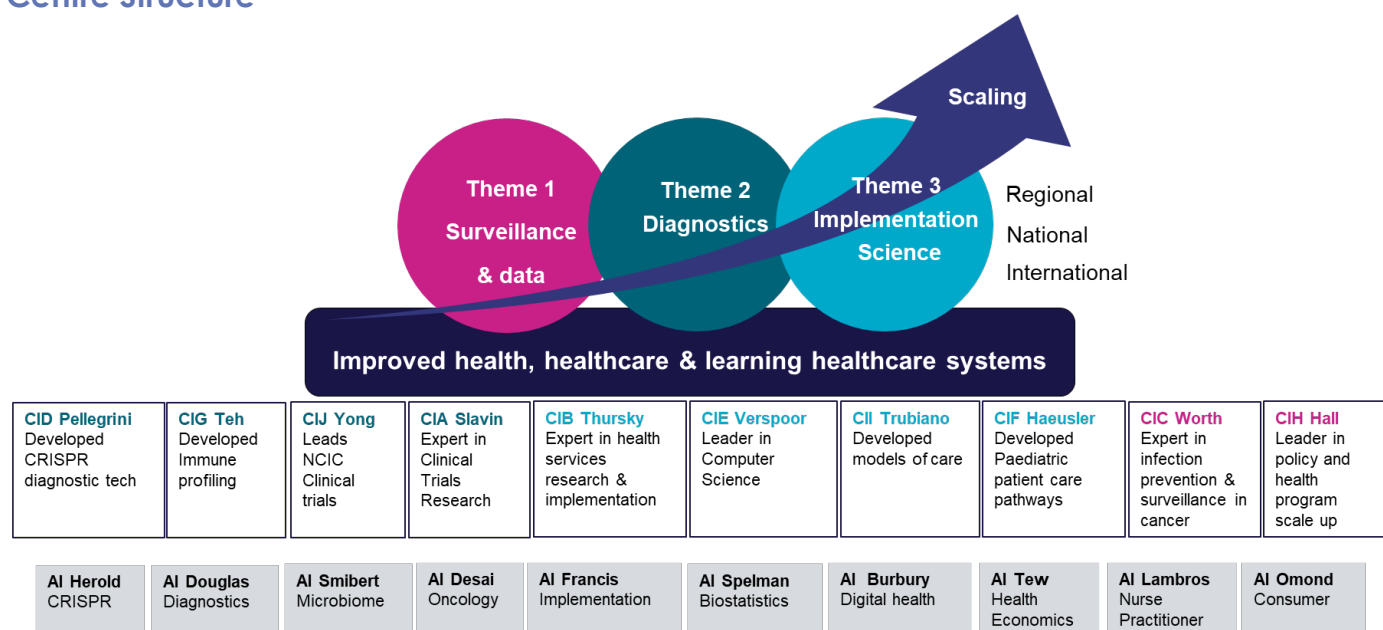


The National Centre for Infections in Cancer was conceived in response to data on infections in cancer being a leading cause of death and a significant cost to the healthcare system.

To date, no group has systematically addressed this problem in Australia nor is it addressed in national cancer strategies.

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## Centre Structure



Centre manager: Dr Megan Crane

Clinical trials team: Rachel Woolstencroft, Gwyn Ng, Marcel Stewart, Hayley Page, Jess Demajo, Chhay Lim, Jenny Gallagher, Surekha Tennakoon, Natalie Saunders, Emily Klimevski, Beatrice Sim, Nick Laundry

PhD students: Victoria Hall, Gemma Reynolds, Jasmine Teng, Alison Lemoh, Dan Neoh

## Funding report

### Commonwealth funding for cancer and infection projects

NCIC began in 2017 with \$2.5 million in funding as an NHMRC Centre for research Excellence. In Jan 2022 the NCIC was awarded a further \$5 million NHMRC synergy grant until 2026. Since beginning in 2017 we have secured a total of \$20 million in NHMRC and MRFF grants for projects in infections in cancer.

Table 1 (Lead investigator funding)

Investigator	Year	Study/Project	Source	Funding
<b>Monica Slavin</b>	<b>2017</b>	<b>NCIC</b>	<b>NHMRC</b>	<b>\$2.5 million</b>
	2019	Investigator	NHMRC	\$1.6 million
	2020	CSMART	MRFF	\$2.169 million
	<b>2022</b>	<b>Synergy</b>	<b>NHMRC</b>	<b>\$5 million</b>
<b>Karin Thursky</b>	2016	PICNICC	NHMRC	\$600,000
	2017	No place like home	BCV	\$445,000
	2019	AFS	NHMRC	\$1.6 million
	2022	Appropriate Antimicrobial Use	MRFF	\$3 million
<b>Gab Haeusler</b>	2019	No place like home	MRFF	\$1.2 million

<b>Ben Teh</b>	2021	Investigator grant	MRFF	\$1.1 million
	2022	Foundation grant	PMCC	\$50,000
<b>Jason Trubiano</b>	2018	Allergy	BCV	\$400,000
<b>Abby Douglas</b>	2022	Foundation grant	PMCC	\$50,000
				<b>\$19.714 million</b>

In addition NCIC investigators have been named on and receive funding through our network collaborations.

Table 2 (Non lead funding)

Year	Study/Project	Lead Investigator	Source	Funding total
2022	Immune responses to COVID	Katherine Kedierska (UoM)	MRFF	\$3 million
2021	META-GP	Deborah Williamson (RMH)	NHMRC	\$7 million
2021	Super bugs II	Lindsay Grayson (Austin health)	NHMRC	\$2 million
2021	CRE-Respond	Jason Roberts (UQ)	NHMRC	\$2.5 million
2021	C-FIND	Marc Pellegrini (WEHI)	MRFF	\$870,000

### Industry funding for cancer and infection projects

Since establishing the NCIC clinical trials team in 2017 we have worked on a number of investigator initiated and pharma initiated clinical trials. The Clinical trials team of 4 research nurses (Gwyn Ng, Haley Page, Marcelle Stewart and Jess Demajo) a data manager (Belinda De Poi), 2 clinical trials assistants (Chhay Lim and Jenny Gallagher) and 3 laboratory assistants (Surekha Tennakoon, Natalie Saunders and Emily Klimevski) is led by nurse manager Rachel Woolstencroft and medical lead Dr Michelle Yong.

Table 3 (Investigator initiated and pharma initiated clinical trials)

Investigator	Year	Study/Project	Source	Funding
<b>Monica Slavin</b>	2018	F2G	F2G	\$70,000/patient
	2019	Paraflu	Ansun	\$45,000/patient
	2018	Restore	Cidara	\$70,000/patient
	2020	APX001	Medpace	\$50,000/patient
	2020	SYNERGIA	Syneos	\$50,000/patient
	2019	Posa	MSD	\$120,000
	2020	RSV	Janssen	\$50,000/patient

<b>Ben Teh</b>	2019	Flu vax I	MSD	\$60,000
	2022	Flu vax II	Sanofi	\$50,000
	2021	PROSECCO	Merck	\$100,000
<b>Michelle Yong</b>	2018	Cresct	MSD	\$270,000
	2020	Cresct expansion	MSD	\$250,000
	2022	Paxlovid	Pfizer	\$123,000/pt
<b>Abby Douglas</b>	2019	PIPPIN	Gilead	\$60,000
<b>Shio Yen</b>	2020	CrispBAL	Gilead	\$60,000
<b>Zoe Neoh</b>	2020	AusLOPRO	F2G	\$300,000
	2022	Fungal surveillance	Gilead	\$60,000

## Track record

### Publications

**Time period: Jan 2017- Jun 2022**

- **Total** 1219 papers, 1547 citations
- Average 12.3 citations per paper
- 41.5% are due to an international collaboration, 56.8% are a national collaboration
- Average Field weighted citation impact factor 1.94
- 36.2% in top 10% journals
- 69.1% are in the field of Medicine, also publish in fields of Immunology, Biochemistry and Pharmacology

### Public engagement

Table 4

Type	Analytics
<b>Website</b>	2017: 737 unique visitors, 2,165 page views 2019: 2384 unique visitors, 4498 page views 2020: 6900 unique visitors, 12000 page views
<b>Twitter (28 day snapshot)</b>	2017: 13.1K impressions 2019: 14.1K impressions 2020: 15.5K impressions
<b>Features</b>	4x MJA articles on microbiome 1x Conversation article on Candida Auris

	ABC news interview Candid Auris 1X conversation article on Mucor Mycosis and COVID BBC World news interview Mucor Mycosis and COVID
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## Seminars, conferences and education programs

Table 5

Type	Year	Topic
<b>Conference</b>	2021	International Conference of the Immunocompromised Host Society (ICHS)
<b>Symposium</b>	2017	NCIC Launch
	2018	What's new in cancer
	2019	New Frontiers in cancer infection management
	2020	Fungal infections in focus
	2022	COVID in ICH
<b>Forum</b>	2019	Your gut Health: consumer engagement
	2022	Synergy IM
	2022	PROSECCO IM
<b>Invited speakers</b>	2017	Peter Pappas: C.Diff, Paul Verweij: antifungals
	2018	Josh Hill: ICIs and HSV, Jason Roberts: PK/PD
	2019	Bob Finberg: Flu, Burton Dickie: novel antivirals, Dena Lyras: FMTs
<b>Medical and nursing in-service education</b>	Ongoing	Sepsis pathway in service
	Ongoing	ID for Haem- registrar training

## Progress towards sustainability

## Infection surveillance

- The NCIC has demonstrated the significant burden of infections using manual surveillance methods [1].
- We have successfully piloted the use of large linked datasets to reduce resource demands of reporting [2].
- We have led the concept of enhanced surveillance for cancer-related infections (sepsis, invasive fungal infections, blood stream infections, and *Clostridioides difficile*) using gold-standard data linked to administrative data [3-5]

- We have a proof-of-principal project (Antifungal Stewardship) under development in a current NHMRC project grant (AFS-see table 1)
- We are currently carrying out a national surveillance for fungal infections (AusLoPro- see table 3)

## Implementation of clinical care pathways

Table 6

Pathway	Innovation	Economic savings	Patient outcomes
<b>Cancer Sepsis Pathway [6, 7]</b>	First ever whole of hospital nurse led clinical pathway for recognition and management of sepsis (single site)	Short term ICER of \$8000 per patient on pathway with lives saved. Future costing across cancer types cost effectiveness[8]	Reduction in mortality ~50%, LOS, ICU admission
<b>Think Sepsis Act Fast Scaling Collaboration [9]</b>	Cancer sepsis pathway adapted for non cancer hospitals, and implemented in 24 Victorian hospitals	\$11.5 million cost savings for the project Short term ICER cost saving and more effective	Reduction in mortality ~50%, LOS, ICU admission adjusted for sepsis severity
<b>Ambulatory pathway of care for low risk neutropenic fever in adults and children</b>	First adult and paediatric low risk FN program. Paed program scaled nationally 8 sites and internationally to 12 sites[10]	Paed: mean cost saving \$12,800 per patient on programAdults: Health economic model projected	Improved QoL, reduction in LOS, increased bed access and no adverse outcomes.
<b>Vaccination pathways for high risk patients [11]</b>	Vaccination protocol and counselling service for patients at high risk for vaccine-preventable infections (3 sites)	For evaluation	Near universal vaccination uptake and higher completion rates
<b>Point-of-care Antibiotic Allergy delabelling [12]</b>	First ever inpatient and outpatient AMS led delabelling program for antimicrobials. In 2 sites: Peter Mac and Austin hospitals	\$335 per patient cost saving was noted in a cost-effectiveness analysis with an inpatient penicillin delabelling program.	10-fold increase in narrow spectrum penicillin usage, 2-fold increase in appropriate prescribing

ICER; incremental cost effectiveness ratio, LOS, length of stay; ICU, intensive care; QoL, quality of life, FN Febrile neutropenia



### Innovative technologies

NCIC has established a highly successful Clinical trials group which employs four clinical trials nurses, two clinical trials assistants and two laboratory research assistants. Current pharma and investigator initiated trials (table 3) in cancer patients include:

- Novel antifungals (F2G, Restore, APX001, Synergia),
- Novel antivirals (RSV, paraflu),
- Novel prophylaxis strategies (Flu vax, CSMART {see table 1}, posa)
- Novel diagnostics (Pippin, CrispBAL, Cresct and Cresct expansion)

### Workforce capacity

- NCIC employs 31 people on both clinical, trials and research roles (Table 7)
- NCIC has 7 current and 5 completed PhD students (Table 8)

Table 7

Staff member	Role
<b>Monica Slavin</b>	Dept head, stream lead, clinician
<b>Karin Thursky</b>	Dept head, stream lead, clinician
<b>Leon Worth</b>	Dept head, stream lead, clinician
<b>Ben Teh</b>	Fellow, clinician
<b>Michelle Yong</b>	Fellow, clinician
<b>Belinda Lambros</b>	Nurse Practitioner
<b>Registrar</b>	Clinician
<b>Gab Haeusler</b>	Fellow, clinician
<b>Jason Trubiano</b>	Fellow, clinician
<b>Abby Douglas</b>	PhD student, clinician
<b>Shio Yen Tio</b>	PhD student, clinician
<b>Su Ann Ho</b>	PhD student, clinician
<b>Olivia Smibert</b>	PhD student, clinician
<b>Morgan Rose</b>	PhD student, clinician
<b>Megan Crane</b>	Manager
<b>Krishna Brannigan</b>	Admin
<b>Nick Laundry</b>	International visiting fellow
<b>Chhay Lim</b>	Research Assistant
<b>Marcelle Stewart</b>	Research nurse
<b>Surekha Tennakoon</b>	Research Assistant
<b>Natalie Saunders</b>	Research Assistant
<b>Rachel Woolstencroft</b>	Research nurse
<b>Hayley Page</b>	Research nurse
<b>Gwyn Ng</b>	Research nurse
<b>Anna Khanina</b>	Fellow
<b>Zoe Neoh</b>	Fellow

<b>Jenny Gallagher</b>	Research Assistant
<b>Belinda Depoi</b>	Data manager
<b>Jess DeMajo</b>	Research nurse
<b>Victoria Hall</b>	PhD student, clinician
<b>Gemma Reynolds</b>	PhD student, clinician

Table 8 PhD students

Student	Completion year	Scholarship
<b>Abby Douglas*</b>	2021	UoM
<b>Shio Yen Tio</b>	2023	NHMRC
<b>Su Ann Ho</b>	2023	CRE-REDUCE
<b>Michelle Tew*</b>	2020	UoM
<b>Jake Valentine*</b>	2021	UoM
<b>Oliva Smibert**</b>	2023	NHMRC
<b>Victoria Hall</b>	2024	NHMRC
<b>Gemma Reynolds</b>	2024	NHMRC
<b>Jasmine Teng</b>	2024	NHMRC
<b>Julian Lindsay*</b>	2021	NCIC
<b>Brendan McMullen*</b>	2020	UoM
<b>Morgan Rose</b>	2023	UoM
<b>Dan Yeoh</b>	2022	UoM

\*Completed

\*\*Recipient of the Gus Nossal NHMRC PhD fellowship and The Rosie Lew PMCC PhD fellowship awards

- In 2020 we appointed an AMS Nurse Practitioner (Belinda Lambros)
- Current research fellows have won numerous awards, are now Head of Department and/or are named as CIA on grants (Table 9)

Table 9 Career Development awards

Investigator	Year	Award/achievement
<b>Ben Teh</b>	2018	UoM Chancellors Award
	2018	Vic Premier's award
	2020	NHMRC Investigator grant
	2021	Appointed Advisor to ATAGI
<b>Gab Haeusler</b>	2018	Vic Premier's award
	2019	UoM Chancellors Award

	2019	CIA on MRFF project grant
<b>Jason Trubiano</b>	2020	Appointed Acting Head Dept ID Austin Hospital
<b>Karin Thursky</b>	2019	FAAHMS
	2019	UoM Kay Campbell Fellowship
	2021	Assoc, Director HSRIS
<b>Monica Slavin</b>	2019	FAAHMS
	2021	UoM Chair ICH
<b>Michelle Yong</b>	2022	PMCC Women in Science Lea medal
<b>Abby Douglas</b>	2022	PMCC Significant PhD award

## References

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