MINISTRY OF BUSINESS, INNOVATION & EMPLOYMENT
HĪKINA WHAKATUTUKI

Agency for Science, Technology and Research
SINGAPORE

New Zealand-Singapore Biotech in Future Foods Research Programme

Call for Proposals

Application opening date:	2 December 2024
Application closing date and time:	28 February 2025 5:00 PM (New Zealand Daylight Time) 12:00 PM (Singapore Standard Time)
Implementing Agencies:	New Zealand – Ministry of Business, Innovation and Employment (MBIE) Singapore – Agency for Science, Technology and Research (A*STAR)
Enquiries:	Please direct further queries to: New Zealand-based applicants: internationalscience@mbie.govt.nz Singapore-based applicants: A-STAR_FNCC@hq.a-star.edu.sg
Date guidelines released:	2 December 2024
Grant website	MBIE: Catalyst: Strategic – New Zealand-Singapore Biotech in Future Foods Research Programme A*STAR: A*STAR Funding Opportunities Information on this Call for Proposals and all application materials can be found on MBIE's and A*STAR's respective grant websites.

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Biotech in Future Foods Research Programme

Programme Overview

A whole-of-government New Zealand-Singapore Enhanced Partnership was launched by the Prime Ministers of New Zealand and Singapore in 2019. Under this partnership, the Ministry of Business, Innovation & Employment (MBIE) and the Agency for Science, Technology and Research (A*STAR) launched the New Zealand-Singapore Bilateral Research Programme on Future Foods in January 2020. In the first call for proposals, the objectives were to:

- Support and encourage the development and exchange of scientific strengths and capabilities between both countries' research communities
- Catalyse benefits from each other's global connections to cutting edge science
- Create a research programme which produces a holistic, end-to-end research project, where developments are systematically shared and built upon

Building on the successes in scientific exchange and capabilities development in future foods innovation, MBIE and A*STAR are launching a second Call for Proposals ('the Call') for the New Zealand-Singapore Bilateral Research Programme on Future Foods. The Call will focus on the following priority areas:

- Smart and Sustainable Processes
- Health and Nutrition

Objectives

Research projects shall leverage the complementary research capabilities in Singapore and New Zealand to drive transformative advancements in the future food industry of both nations, through the development of biotechnology innovations that translate to health and economic impact.

The projects will contribute to the overarching objective of the development of Future Foods capabilities in both Singapore and New Zealand. Funded research will focus on innovative food products that employ advanced biotechnology solutions in the food manufacturing process to achieve improved sustainability, accessibility, and nutritional profiles compared to traditional food systems.

Successful projects shall (in no particular order):

- Lead to research translation of project deliverables into the future food industry, which may include IP licensing or spin-offs
- Develop technologies that enable scalable and sustainable production of future foods
- Deliver impact in human health and longevity through improvements in next-generation future food ingredients
- Deepen research collaborations between Singapore and New Zealand scientists with complementary research capabilities in future foods R&D

- Grow the future food industries of both countries through novel biotechnology innovations and expanded market access

Priorities

Proposed projects shall develop technologies at intermediate Technology Readiness Levels (TRL) of 3-5 (refer to Appendix 4 for TRL definitions) towards translational outcomes that address current challenges in the future food industry in Singapore and New Zealand. Some of these challenge statements were discussed in the July 2024 scoping workshop. Please refer to the workshop summary slides for more details.

Future foods are defined as innovative food products and ingredients (including alternative lipids, proteins, and carbohydrates) that employ **advanced biotechnology** solutions in the food manufacturing process (e.g. fermentation, cellular agriculture) to achieve **improved sustainability, accessibility, and nutritional profiles** compared to traditional food systems.

Proposed projects must identify and address challenges in the research areas of "Health and Nutrition" or "Smart and Sustainable Processes". Examples of challenge statements of interest include (but are not limited to):

1. **Smart and Sustainable Processes**
    a. Developing scalable food processing technologies to enhance taste, texture and nutritional quality in future food products
    b. Developing techniques for high-throughput optimization of food manufacturing / precision fermentation bioprocesses
    c. Optimising food processing technologies towards net-zero carbon and waste
2. **Health and Nutrition**
    a. Understanding the health impact of extended consumption of future foods
    b. Developing functional foods with enhanced nutritional properties that improve health span
    c. Understanding the gut-brain-immune axis and its implications for population health

To encourage comprehensive proposals with higher translation potential, projects that include **applied consumer insights** (e.g. connecting local consumer preferences to regionalize future food development) and **food matrix** studies (e.g. impact of ingredient interactions on taste, texture and nutritional value of future foods) will be prioritized.

Proposals must describe the expected industry impact, including details of follow-on plans for translation and commercialization of project deliverables (e.g. IP licensing, spin-offs, etc.). Collaborations with industry partners interested in the co-development and / or commercialization of project IP are highly desirable (though not mandatory). Proposals should exhibit significant novelty, strong industry demand, immediate translation potential and a viable business model. Proposals must demonstrate excellent, high-impact research in areas of relevance and importance to Singapore's and New Zealand's economic, societal, or environmental wellbeing.

Innovations in **advanced technologies** (e.g. artificial intelligence (AI), bioprocessing, genetic engineering) that are **well-positioned for industrial-scale applications** are highly desirable.

Proposals should identify expected regulatory hurdles that may influence its industry translation outcomes and potential ways to overcome them.

Further information

Please direct further queries to:

- New Zealand-based applicants: internationalscience@mbie.govt.nz
- Singapore-based applicants: A-STAR_FNCC@hq.a-star.edu.sg

The Funding Opportunity

What funding is available?

This research grant is a **bilateral** initiative funded by the New Zealand and Singapore Governments.

New Zealand and Singapore applicants must **jointly develop a single proposal** that will be submitted to A*STAR (with MBIE in CC) via email. MBIE and A*STAR will jointly assess the proposals and agree on the successful projects to award funding to.

New Zealand project teams may apply for **up to NZ$3 million** (excluding GST) of funding from MBIE (through the Catalyst Fund) over three years, and Singapore project teams may apply for **up to S$1.25 million** (including overheads of 30%) from A*STAR over the same period. Each project team must have two separate budgets: one for the Singapore contribution and the other for New Zealand. Direct research costs (i.e. excluding overheads) on each side should be roughly equivalent. Please refer to Appendix 1 for details of the of the Catalyst Fund.

Who is eligible?

This Call is for **joint submissions** that involve at least one New Zealand-based Principal Investigator (PI) and one Singapore-based PI.

New Zealand PIs must be employed by a **New Zealand-based research organisation**[1]. Applications are open to both public and private New Zealand-based research organisations. However, proposals will be assessed against their public benefits and private organisations should clearly indicate how their proposal will benefit New Zealand.

Singapore PIs must hold a primary appointment of **at least 75% in a Singapore-based publicly funded institution** and salaried by the institution[2]. The Singapore project team and research activities may include self-funded industry contributions and partnerships.

Proposals submitted for this Call must meet the eligibility criteria on page 8. An eligibility check will be conducted by MBIE and A*STAR, and organisations may be required to provide evidence that they meet the eligibility criteria. Proposals that MBIE and A*STAR determine do not meet these criteria will be declined for funding on eligibility grounds.

What does the funding cover?

[1] Eligible New Zealand-based organisations include public and private research organisations, or a New Zealand-based legal entity representing a New Zealand-based research organisation. The New Zealand project team is required to confirm they have the agreement from their host institution (for instance from the Research Office) prior to submitting the proposed research plan.

[2] Eligible Singapore-based public sector research performers include the Institutes of Higher Learning (including universities and polytechnics), A*STAR Research Institutes, and non-defence related public sector agencies (e.g., Ministries, Statutory Boards). For applications to A*STAR, proposals must be submitted with the appropriate endorsement by the respective Host Institution (by the Chief Executive Director, Executive Director, the Director of Research or equivalent) to ensure that organizational support is clearly associated with the proposed research plan.

New Zealand

The research funding can be used for direct project costs, including consumables required for the project, and indirect costs (overheads) (i.e. operational costs borne by the applicant organisation not covered by the direct costs specified in the project).

Research funding from New Zealand can only be used to fund New Zealand researchers' activities and reasonable expenses directly related to the project including:

Expense	Details
Research activities	Research activity expenses for: • consumables and other research expenses • personnel • subcontractors
Research exchanges	Research exchange expenses for • flights / transport • accommodation • travel visas and travel insurance • meals (excluding alcohol) Travel costs should not exceed 25% of the budget and all expenditure by individuals should adhere to the rules of the organisation they are affiliated with.

The research funding cannot be used for:

- expenses unrelated to the delivery of the contract
- any capital expenditure (unless otherwise agreed in writing with MBIE)
- dealing with accidents or disasters during the term of the contract
- expenses outside any categories listed in the project budget (without prior written permission from MBIE)
- any of the Singaporean researcher activities and expenses
- salaries of individuals employed by New Zealand local or central government.

You will be asked to provide a breakdown of your project's budget in your proposal. Please refer to MBIE's funding policies, terms and conditions.

Singapore

For the fundable and non-fundable expenses for the Singapore project team's budget, please refer to the following A*STAR guidelines and terms and conditions:

Guidelines for the management of A*STAR grants

A*STAR terms and conditions

Eligibility criteria

For a proposal to be assessed under this investment, it must meet the following eligibility criteria. Proposals that MBIE and A*STAR determine do not meet these criteria will be declined for funding on eligibility grounds.

1. The proposal must be jointly developed by the proposed New Zealand and Singaporean research partners and must involve at least one New Zealand-based Principal Investigator (PI) and one Singapore-based PI.
2. The New Zealand PI must be employed by a New Zealand-based research organisation, or a New Zealand-based legal entity representing a New Zealand-based research organisation
3. The New Zealand project team is required to confirm they have the agreement from their host institution (for instance from the Research Office) before submitting the proposed research plan.
4. Proposals must not be hosted by or led by a department of the public service as listed in Schedule 2 of the Public Service Act 2020 of New Zealand.
5. Proposals must not benefit a Russian state institution (including but not limited to support for Russian military or security activity) or an organisation outside government that may be perceived as contributing to the war effort.
6. The Singapore PI must hold a primary appointment of at least 75% in a Singapore-based publicly funded institution and salaried by the institution. Eligible Singapore-based public sector research performers include the Institutes of Higher Learning (including universities and polytechnics), A*STAR Research Institutes, and non-defence related public sector agencies (e.g., Ministries, Statutory Boards). For applications to A*STAR, proposals must be submitted with the appropriate endorsement by the respective Host Institution (by the Chief Executive Director, Executive Director, the Director of Research or equivalent) to ensure that organizational support is clearly associated with the proposed research plan.
7. The proposal must include two separate budgets specifying each country's contributions. Direct research costs and overall resource contributions (including in-kind) from each country should be approximately equivalent.
8. The proposal must meet all submission timeframes and formatting requirements.

Applications are open to both public and private New Zealand-based research organisations. However, proposals will be assessed against their public benefits and private organisations should clearly indicate how their proposal will benefit New Zealand.

Applicants must not submit multiple applications based on the same project, where the only difference is in the duration of the proposed project, the amount of funding sought, or project team members involved. Should the same project team decide to submit more than one proposal, they must demonstrate significant differences between those proposals. If a project team submits multiple proposals based on the same project, all proposals for that project may be deemed ineligible.

Application Process

Application Timeline

2 December 2024	Call for Proposals Opens
9 December 2024	Information session for Call for Proposals
28 February 2025 5 PM (NZDT)	Closing date for proposals
March-April 2025	Assessment of proposals
May-June 2025	Selection of proposals and awarding
July 2025	Projects begin

Process overview

The application process consists of four stages:

1. **Proposal:** New Zealand and Singapore applicants will jointly develop their full proposal and submit it to A*STAR (with MBIE in CC) via email before the stipulated deadline.
2. **Assessment:** Proposals will be assessed by a panel of independent expert assessors jointly convened by MBIE and A*STAR. The assessors will evaluate the proposals based on the assessment criteria on pages 14-15.
3. **Selection:** The assessment scores and feedback will be consolidated and submitted to a joint MBIE-A*STAR committee, which will select which proposals to fund based on the assessor evaluations and portfolio balance. MBIE and A*STAR will notify applicants of the funding decisions once the selection process is complete. Individual feedback will be available on request.
4. **Contracting:** MBIE will use the standard General Funding Contract with the successful New Zealand applicants' research organisation (subject to any pre-contractual conditions being met). This Funding Contract will contain information from the request for funds and will be sent to the applicant organisation's designated Contract Administrator. A*STAR will enter into a separate contract with the Singapore applicants' organisation through its standard contracting process.

Writing the Proposal

Before developing your proposal, you must consider the:

- Eligibility criteria (page 8)
- MBIE terms and conditions (Appendix 2)
- A*STAR Terms and Conditions

If you believe you meet the eligibility criteria and agree with the terms and conditions, now is a good time to start thinking about the content of your proposal. Please ensure that the content aligns to:

- MBIE and A*STAR's objectives for Phase 2 of the bilateral programme, and
- The assessment criteria in the next section.

The following are general tips for a focused, well supported and clear proposal. The assessors can only review what is in the proposal so it is important to ensure that all key information is present. Please note that any text included in external links will not be considered.

Be succinct

Make every sentence count. A small amount of carefully crafted content is much better than a lot of unfocused content.

Explain local or specialist language

Assessors may not know all of the subject areas or areas of activity in the proposal in detail. If local or specialist terms are being used, they should be sufficiently explained.

Provide context for your idea

Assessors need to know where and how activity in the proposal fits into the science and innovation landscape, including links or relationships to existing future foods capability building or research projects, nationally and internationally.

Personnel and delivery

Assessors want to know that the proposal utilises experienced, skilled and suitable people. Identify what your organisation and the proposed sub-contractors do and demonstrate that your team has the skills to deliver the project by providing relevant information on key individuals, including CVs or relevant examples of their experience and skills.

Capability development

Assessors want to know how your proposal builds capability. Be clear about what new skills, relationships and knowledge will be developed in the course of the project. Explain in your proposal how your project will include and upskill post-doctorate and PhD students.

Clear and logical

Make sure the proposal is clear and logical, in particular how any activity will lead to the proposed outcomes. Provide evidence where appropriate to support the proposed activity and outcomes.

Evidence of proposed outcomes

Where relevant ensure you support your proposed ideas, approaches and outcomes with appropriate evidence.

Ethical, data management and regulatory compliance and consent

As necessary, ensure that any issues of ethical approval and regulatory compliance are addressed. Ensure that any issues around privacy and data sovereignty are addressed.

ANZSRC codes

We have asked you to identify three to four six-digit ANZSRC codes for each Socio-Economic Objective (SEO) and Field of Research (FOR) in your proposals.

An ANZSRC (Australian and New Zealand Standard Research Classification) code is a standard classification that allows research and development activities to be categorised according to their intended purpose or outcome. Definitions are available online at the *Australian Bureau of Statistics*. More details can be found in Appendix 3.

SEO Codes	**FOR Codes**
Please provide up to three to four six-digit SEO ANZSRC codes, and allocate the percentage of relevance against each code, totalling 100%.	Please provide up to three to four six-digit FOR ANZSRC codes and allocate the percentage of relevance against each code, totalling 100%.

Proposal Assessment

To be assessed, your proposal must meet the eligibility criteria set out on page 8. If it meets these eligibility criteria, it will be assessed against the assessment criteria (detailed on pages 14-15) by independent assessors, who will advise MBIE and A*STAR on which proposals to fund.

Assessment process

1. MBIE and A*STAR will review the applications to ensure they meet the eligibility criteria and assign eligible proposals to assessors for individual assessment. Each proposal will be read by up to four assessors that are experts in the priority area(s) addressed by the proposal.
2. Assessors will independently review and score proposals on a 1 – 7 scale for each of the assessment areas (Impact, Excellence, Connections), which are weighted 40%, 30% and 30% respectively to calculate a total score for each proposal assessment. Individual assessors' scores and comments are submitted through a structured online form put together by MBIE and A*STAR.
3. Scores and comments from the independent assessment of all proposals will be collated by A*STAR and MBIE. Each proposal will be ranked based on their average assessor scores. The top proposals will be shortlisted for recommendation to a joint MBIE-A*STAR committee which will decide which proposals to fund.

Assessors

A Panel of 8 independent expert assessors will be jointly convened by MBIE and A*STAR. MBIE and A*STAR will each appoint 4 assessors to the Panel. The role of the assessors is to score proposals according to the assessment criteria of Impact, Excellence and Connections, which will advise MBIE and A*STAR on their relative rankings and which projects are of high quality and fundable.

Assessors will be selected based on their ability to contribute to one or more of the following criteria:

- Scientific knowledge relative to the range of topics covered by the research areas
- Broader international strategic expertise and experience
- Knowledge about complex international research programmes
- Knowledge of Vision Mātauranga (for New Zealand assessors).

Conflicts of interest

The Assessment Panel names will be published on the MBIE website.

New Zealand appointed assessors will follow a conflict-of-interest registration and mitigation process consistent with New Zealand Government policy as detailed in the assessor contractual terms. Assessors will be required to declare any potential conflicts of interest to A*STAR and MBIE.

A*STAR and MBIE will review potential conflicts and mitigation strategies may include excluding the identified assessor from reviewing a submission.

What is considered a conflict of interest?

Conflicts of interest may occur on two different levels:

A **direct conflict of interest**, where an Assessor is:

- directly involved with a proposal (as a participant, manager, mentor, or partner) or has a close personal relationship with the applicant (e.g. family members)
- a collaborator or in some other way involved with an applicant's proposal.

An **indirect conflict of interest**, where an Assessor:

- is employed by an organisation involved in a proposal but is not part of the applicant's proposal.
- has a personal and/or professional relationship with one of the applicants (e.g. an acquaintance).
- is assessing a proposal under discussion that may compete with their business interests.

Assessment criteria

Assessors will assess proposals on each of the criteria listed below and score them from 1 (Low quality) to 7 (High quality). These criteria are intended to deliver on the bilateral programme's outcomes and objectives and ensure publicly funded research is of the highest quality by international standards and have clear line of sight to eventual impact. International collaboration can positively impact the excellence and impact of our science in both Singapore and New Zealand.

These criteria should be read in concert with the objectives for this Call and you are expected to outline how your proposal will deliver against these objectives. Please note that the Call's objectives are not tied to a specific assessment criteria category and will be assessed against your entire proposal.

Impact (40%)

Will the project deliver benefit health and economic impact that grows the Future Food industries of New Zealand and Singapore?

Assessors will look for how the proposal:

- has tangible benefits that are of national significance and linked to policy priorities. The analysis or rationale which supports the estimates of benefit and uncertainty is excellent and that any implementation and/or commercialisation plans give full confidence that the work would be achievable and delivered as indicated.
- identifies research areas that will enable the wider New Zealand and Singapore research communities to contribute to solving national or global problems
- is ambitious, yet realistic, with clearly defined goals and outcomes, including a route-to-market strategy and/or targets for industry translation.
- has the potential for translation and commercialization of project deliverables (e.g. IP licensing, spin-offs, etc.).
- includes applied consumer insights (e.g. connecting local consumer preferences to regionalise future food development) and/or food matrix studies (e.g. impact of ingredient interactions on taste, texture and nutritional value of future foods).
- has the commitment of a New Zealand of Singaporean industry partner with current business interests in either country.
- has the potential to support a pipeline of research and knowledge transfer to build long-term capability and enable the development of new ideas and applications
- has identified and evaluated the potential impacts for Māori (where relevant).

Excellence (30%)

Will the project lead to the creation of new knowledge through high quality research?

Assessors will look for evidence of how the proposal:

- leads to the creation of new knowledge which is of the highest calibre, and that will have national and international scientific impact and recognition

- utilises applicable scientific and technological principles, including a well-designed research plan and a credible approach to managing risk, that will enable delivery of the proposed research
- is ambitious in terms of scientific risk, novelty and/or innovative approaches, and leverages state-of-the-art knowledge and facilities
- is led by world-class science leaders or potential future leaders, with the skills, knowledge and resources to deliver the proposed activities and to manage risk
- provides the mix of complementary skills, knowledge and resources to deliver the proposed research, science or technology or related activities and to manage risk

Connections (30%)

Will the project establish an enduring collaboration between New Zealand and Singapore institutions?

Assessors will look for evidence in the proposal of how:

- the proposed partners bring a mix of complementary resources, capabilities and expertise to the proposed project, building a connected and high performing research team
- the project milestones are co-designed and delivered in an integrated manner, clearly outlining team contributions and implementation
- the research team and its partners have the capabilities and capacity to build and manage a substantive international partnership, to fully realise the international opportunities outlined in the proposal, and to deliver the proposed activities
- the identified project partners are building and sustaining genuine and long-lasting connections with leading international research centres, science leaders, and entrepreneurial talent to strengthen science capability and performance
- Any (if relevant) connections with and for Māori will be genuine and of value to tangata whenua

Other considerations

When deciding which projects to fund, MBIE and A*STAR will consider whether the the overall mix of investments :

- is likely to achieve the objectives of this bilateral programme
- is aligned with or relevant to national contexts, strategies, and policy priorities
- will ensure that funding is not duplicated

Selection and Contracting

Selection process

Shortlisted proposals will be taken to a joint committee meeting between MBIE and A*STAR. The joint committee comprises of two co-chairs from MBIE and A*STAR that are responsible for making the funding decisions, and the assessor panel. The co-chairs will review the independent assessments of the shortlisted proposals in discussion with the assessors, and agree on the portfolio of projects for funding, ensuring that the decision taken by A*STAR is the same decision taken by MBIE.

MBIE and A*STAR may decide to either:

- approve your proposal
- decline your proposal
- approve your proposal with conditions that must be met before or during the contract
- approve your proposal for an adjusted amount of funding.

In addition, MBIE may also:

- set pre-contractual conditions which must be met before the investment is contracted
- set special conditions in addition to the general terms and conditions set out in the Fund's Funding Contract
- vary the contract title (in consultation with the applicant)
- vary the proposed term of the project
- vary the funding allocated from that proposed
- require the proposed project plan be negotiated to MBIE's satisfaction to reflect the changed funding.

Please note:

- MBIE and A*STAR may choose not to fund any proposals if applications do not sufficiently address the criteria and/or issues with proposals cannot be rectified to MBIE's satisfaction.
- Participation in the investment process does not guarantee funding.

Notifying you of the outcome

When a decision about your proposal has been made, MBIE and A*STAR will advise the contact person listed in your proposal by email. MBIE and A*STAR may also contact this person to discuss the decision.

Following notification, MBIE will publish its decisions and may announce these with a press release. General feedback to all applicants will be provided upon request.

MBIE may make public the following information:

- The proposal title
- The name of the successful Host (the Contracting organisation)

- The names of all sub-contracting organisations
- The public statement (as provided in the proposal)
- The public statements in the reports (if funded)
- The total amount of funding provided, and a breakdown of funding by financial year
- The contract number (if funded)
- The contract start and end dates (if funded)
- The contract status (if funded)
- Any Australian and New Zealand Standard Research Classification (ANZSRC) codes provided in your application (if funded)
- The name(s) of the Principal Investigator(s) unless the Contractor or individual has requested these remain confidential.
- The NZ Government appropriation that the funding is sourced from.
- The investment round title from which the investment was made.

Meeting the New Zealand Government's data requirements

MBIE is committed to ensuring that all science data generated through its investments meets minimum expectations of good data management and public availability. If you receive funding, MBIE expects you to comply with the New Zealand Government Open Access and Licensing Framework. This framework advocates the use of creative commons licences.

The New Zealand contracting process

MBIE will enter into a contract using the General Funding Agreement template with the successful New Zealand applicants' research organisation. Successful applicants may be contacted to provide extra information if required. If funding is conditional on pre-contract conditions, these must be completed to the satisfaction of MBIE before MBIE will prepare and send you a contract. If you are unable to meet any pre-contract condition by the due date, you need to inform MBIE as soon as possible before that due date. We will discuss and may renegotiate the conditions and/or extend the due date.

Subject to completion of any pre-contract conditions, contracts will be sent to your organisation for signing immediately following notification. This Funding Contract will contain information from the request for funds and will be sent to the applicant organisation's designated Contract Administrator (details provided as part of registration). You will be required to return the signed contract by a date to be advised by MBIE. If you are unable to do so, you will need to inform us as soon as possible.

What information must be in your proposal?

The questions that you are required to answer in your proposal are detailed in the table on the following pages. The areas to consider and suggested content are provided for guidance when developing your proposal and are not an exhaustive list of information you might want to provide.

There are nine sections to complete; *Summary, Team, Eligibility, Abstract and Keywords, Proposal, Case for Support, Key Performance Indicators, Budget,* and *Other information*. New Zealand and Singapore research teams must jointly develop the proposal and mutually agree on the information submitted.

PROPOSAL TEMPLATE		
INFORMATION REQUIRED **This is a guide and is not intended to constrain the information you provide.**		**WORD LIMIT** (if applicable)
SUMMARY		
Project title	Provide a meaningful and easily understood title that identifies the nature of your proposal.	**15 Words**
Duration of Project	Provide the duration of the project, this must be a maximum of 3 years	
Start and End date	Provide the proposed start and end dates of your project. Projects are expected to begin 1 July 2025.	
Funding Requested (New Zealand)	Provide the total funding you are requesting. This can be up to NZ$3 million (GST exclusive)	
Funding Requested (Singapore)	Provide the total funding you are requesting. This can be up to S$1.25 million (including overheads of 30%).	
Priority Research Areas	Specify the research area(s) that best describe a major focus of your proposal: • Smart and Sustainable Processes • Health and Nutrition	
Organisation Administrator (New Zealand)	Provide the name, contact phone number and e-mail address for the primary New Zealand contact person for the project. This contact must have the mandate to discuss the proposal and contracting requirements with MBIE and should be from the Research Office or legal entity representing the New Zealand-based research organisation.	
Organisation Details (New Zealand)	Provide the name of the organisation that will submit the proposal. This must be a New Zealand-based Research Organisation or a New Zealand-based legal entity representing a New Zealand-based Research Organisation.	
NZBN Number	The registration number applies if you are an incorporated society, charitable trust or company.	
Lead PI (Singapore)	Provide the name, contact phone number and e-mail address for the lead PI of the project. This person shall be the primary Singapore contact person to discuss the proposal with A*STAR.	

Lead PI's Organisation (Singapore)	Provide the name of the lead PI's organisation	
TEAM		
Project Team	Provide the names, designations and organisations of the Singapore and New Zealand Principal Investigators / Science Leaders for your proposal. Using the following table as a guide, detail the key personnel that will be involved in each year of funding, and provide Full Time Equivalents (FTEs) and supporting CVs. You must include at least two team members for each role indicated by the * symbol (one from each country's research team). **Sample Team Table** *Role* | *Full Name* | *CV* | *Minimum FTE required* | *Diversity information required for submission of proposal* *Principal Investigator/ Science Leader | *Mandatory* | *Yes* | 0.15 | *Yes* Key Researcher | *Optional* | *No* | *Not Required* | *Yes* #Key Individual | *Optional* | *No* | *Not Required* | *Yes* Researcher | *Optional* | *No* | *Not Required* | *Yes* Expert/mentor | *Optional* | *No* | *Not Required* | *Yes* Student | *Optional* | *No* | *Not Required* | *Not Required* Project support | *Optional* | *No* | *Not Required* | *Not Required* # Key Individual refers to an essential contributor who is not involved in direct research activities The time commitment for each team member is entered as FTEs. For example, 1.00 FTE is the hours worked by an employee on a full-time basis. A half-time employee is entered as 0.50 FTE.	
ELIGIBILITY		
Eligibility Confirmation	Confirm that you satisfy all the eligibility criteria as stated on page 8	
ABSTRACT AND KEYWORDS		
Project Summary	Provide a brief summary of your planned proposal, including a concise, high-level description of what you plan to achieve during the project. Your summary will be used to identify assessors and any potential conflicts of interest. It must not contain commercially sensitive information.	**200 Words**
Keywords	List up to 15 keywords that describe the nature of your proposal. Keywords will help us to align assessors for your proposal.	**15 Words**
Challenge Statement	Describe the challenge statement your proposal will be addressing (example Challenge Statements are provided in the Call for Proposals, however we encourage you to consider creating your own. The Challenge Statement should clearly relate to the impact you are trying to achieve).	**40 Words**

PROPOSAL		
Executive Summary	Summarise the overall objective of your proposal, including: • why your research is needed (the issue or problem you are addressing) • what you are aiming to achieve • what you propose to do (hypothesis and scientific approach) • a high-level description of how the New Zealand and Singaporean teams will work together to achieve it • the results, impacts and outcomes you expect, how they will be achieved, and who will use or benefit from them This will introduce your research, its potential impact(s) and your methodology to the assessors, MBIE and A*STAR. Do not include references, hyperlinks, images, video, or audio files.	**800 Words**
Public Statement	The public statement may be published on MBIE and A*STAR's websites if your proposal is funded. It is not used for assessment purposes. It is important to capture the essence of your research in a way that can be understood by a wider audience and can be used for media purposes. You may include, if required, publishable contact details that can be used by members of the public or the media. Do not include confidential information or references, hyperlinks, images, video, or audio files.	**400 Words**
Research Plan	Explain and briefly outline: • your chosen approach and how it will achieve your objectives • the technical risks you have identified and the steps you have taken or will take to mitigate or manage them • your proposed approach to Intellectual Property (IP) and data management Your Research Plan should be understandable to assessors, regardless of their specific field of expertise. You may include images but not hyperlinks, video, or audio files. **Note:** You will be required to upload more comprehensive IP, data and risk management plans at the end of this application.	**400 Words**
Partner Contributions	If applicable, specify any additional organisation(s) you are collaborating with, their country of origin and their contribution to your research. This should include an indication of full-time equivalent (FTE) effort, key researchers or other resources identified to be contributed (such as co-funding or access to specialised equipment).	**300 Words**
Vision Mātauranga	Where applicable, proposals must consider the relevancy of the Vision Mātauranga Policy. We expect that the Vision Mātauranga Policy will not be relevant to all proposals. Proposals that give effect to the Policy should demonstrate the relevance and use of a fit-for-purpose approach. Will this proposal give effect to the Vision Mātauranga Policy, i.e., realise the potential of Māori people, knowledge, and resources? (Yes/No) If yes: How will this proposal give effect to the Vision Mātauranga Policy? In describing impacts to be realised for New Zealand, include the specific activities, outputs and outcomes that will create impact for Māori.	**300 Words**

CASE FOR SUPPORT		
Impact (40%)	**Key Question: Will the project deliver health and economic impact that grows the Future Food industries of New Zealand and Singapore?** Please give consideration to your industry translation and commercialisation plan. A schematic may support your case (such as an outcome logic framework, or similar diagram). You may include images but not hyperlinks, video, or audio files.	**1200 Words**
Excellence (30%)	**Key Question: Will the project lead to the creation of new knowledge through high quality research?** You may include images but not hyperlinks, video, or audio files.	**1100 Words**
Connections (30%)	**Key Question: Will the project establish an enduring collaboration between and within New Zealand and Singaporean collaborating institutions?** You may include images but not hyperlinks, video, or audio files.	**600 Words**
KEY PERFORMANCE INDICATORS		
Key Performance Indicators (New Zealand)	Detail how the project will measure its performance throughout the life of the project through Key Performance Indicators (KPIs). (Template provided) The KPIs should show how progress towards delivery of the project's objective and post-contract outcomes will be measured with targets to be achieved during the life of the contract. They should include the following performance areas: • Capability Development - Create opportunities for emerging researchers and leaders to build and benefit from global research and innovation industry connections. • Collaboration and Partnerships - Advance New Zealand's global research connectivity, leveraging international expertise and increasing the integration of New Zealand research into global systems. • Financial Sustainability / independence - Create pathways for commercialisation of innovative technologies. • Excellence and Impact - Demonstrate excellent, high-impact research in areas of relevance and importance to New Zealand's economic, societal, or environmental wellbeing. • Vision Mātauranga Where applicable, demonstrate the potential of Māori people, knowledge, and resources and reflect genuine, fit-for-purpose approaches for enabling that potential. MBIE will confer with you on KPIs based on these drafts during the contracting process.	
Milestones and Key Performance Indicators (Singapore)	Singapore-based researchers and industry collaborators should elaborate in detail the proposed project milestones and proposed capabilities indicators. Please use the provided Excel template and rename the file using the following format: *NZ-SG2025 [Last Name of New Zealand PI]_[Last Name of Singapore PI]_Budget Milestones KPIs*	

BUDGET	
Funding per year (New Zealand)	Indicate how the total New Zealand funding you requested will be divided between each year of the project.
Breakdown of expenses (New Zealand)	For each year of the project, provide a budget for the project using the following headings: • Personnel • Travel • Overheads • Materials and Consumables • Subcontracting • Other Travel costs should not exceed 25% of the budget. Total income must equal expenditure and all values should exclude GST. Funding does not allow for annual inflation adjustments over the term of the contract. Any sub-contracting should be identified.
Budget (Singapore)	The Singapore research team should elaborate their budget request in detail using the provided excel template. Please use the provided Excel template and rename the file using the following format: *NZ-SG2025 [Last Name of New Zealand PI]_[Last Name of Singapore PI]_Budget Milestones KPIs*
Other Funding Support (Singapore)	For Singapore applicants, provide the details for **ALL** currently held or applied for national grants. This includes all grants held or applied for by the Singapore-based PI and/or Co-I(s), complete or in progress over the **last three years** preceding this application. National grants include those administered by A*STAR, NMRC, NRF, MOE, or other public funding agencies and foundations. Please use the provided Excel template and rename the file using the following format: *NZ-SG2025 [Last Name of New Zealand PI]_[Last Name of Singapore PI]_Other funding support*
OTHER INFORMATION	
Research classifications	Specify three to four six-digit ANZSRC codes for **<u>each</u>**: • Field of Research (FOR) • Socio-economic Objective (SEO) For each code, specify a percentage of relevance totalling 100% under each category. The codes selected will be used to select assessors for your Proposal. An ANZSRC code is a standard classification that allows research and development activities to be categorised according to their intended purpose, outcome and/or discipline.
Conflicts of Interest	Identify any person who has a potential conflict of interest with the proposal and provide details. Outline any proposed arrangements to manage identified conflicts of interest.

Intellectual Property Management Plan	Outline how will you identify, protect and share any intellectual property generated by the project in accordance with the investment goals and to ensure maximum benefit to New Zealand. This includes management of IP between collaborators. If the success of your project is dependent on access to existing intellectual property, outline the agreements you have in place to use it. Describe how the project will employ an open science model.
Data Management Plan	Outline your data management plan. You will also need to confirm access to any data required for the project.
Risk Management Plan	Outline your risk management plan, including: • technology • key personnel • identification of duplication of research- internationally and domestically. Please include any other risks associated to your project. You may refer to other sections of the project if and where relevant.
Business Implementation / Commercialisation Plan	Describe how you will commercialise the intellectual property developed through this project, and identify suitable industry collaborators that can implement the innovations as part of their business plan. The plan should outline the expected health and economic impact in their target market(s) over the next 5 years, including quantitative (e.g. total cost savings, revenue generated, return on investment) and qualitative (e.g. intangible outcomes, new capabilities) assessments of projected impact derived from project deliverables
Special ethical and regulatory requirements or barriers	Describe any ethical and regulatory requirements (or barriers) and approvals needed to conduct the proposed research. If approvals have not yet been obtained, tell us how and when you expect to do so. If your proposal includes research on organisms that could be regarded as taonga, please describe whether any approvals are needed to conduct the proposed work and whether these have been sought or obtained. If no ethical or regulatory requirements apply to your proposed research simply state “Not Applicable”. You are responsible for meeting all ethical and regulatory requirements relating to your proposed research. Any costs associated with fulfilling these requirements should be included in your budget (as “Other expenditure”). If delays occur due to failure to gain or initiate the necessary approvals, funding may be withheld, withdrawn or renegotiated.
Endorsement	Please upload the following using the joint endorsement form for both Singapore and New Zealand. E-signatures are acceptable. • endorsement from Principal Investigators/ Science Leaders and Industry Collaborators • endorsement from the respective Singapore Host institution (by the Chief Executive Director, Executive Director, the Director of Research or equivalent).
Curriculum Vitae (CV)	Please submit CVs (in PDF format) for all New Zealand and Singapore Principal Investigators. Each CV should be no longer than 4 pages and contain the most recent achievements relevant to the proposed work.

Submitting your Proposal

Proposals must be **submitted via email to A*STAR (with MBIE in CC)** before **5 PM New Zealand Daylight Time (12 PM Singapore Standard Time**) on **28 February 2025**, using the proposal template provided on the websites for this Call. The proposal must be submitted in Word or PDF format. In the email submission:

- Attach the joint application form and all required supporting documentation. Incomplete applications will not be considered for further evaluation.
- Please title your email as: *"Proposal Submission for New Zealand-Singapore Biotech in Future Foods Research Programme – ([NZ PI Last Name], [SG PI Last Name])"*.
- Please rename your joint application form file using the following format: *NZ-SG2025 [Last Name of New Zealand PI]_[Last Name of Singapore PI]_Joint Application Form*.
- Please rename your attachments to include a prefix identifying your project team, following this format: *NZ-SG2025 [Last Name of New Zealand PI]_[Last Name of Singapore PI]*.
- Only one email should be submitted for each proposal application. In the event that multiple emails are received for a proposal, only the latest valid submission will be processed.
- The email should be sent by lead PI of either New Zealand or Singapore, while keeping the lead PI of the other country in CC. The two email addresses will be treated as the main points of contact for the New Zealand and Singapore research teams for the proposal.
- Please submit CVs (in PDF format) for all New Zealand and Singapore Principal Investigators in your application. Each CV should be no longer than 4 pages.
- Address the submission email to A*STAR (A-STAR_FNCC@hq.a-star.edu.sg), and keep MBIE in CC (internationalscience@mbie.govt.nz).

Appendix 1: What is Catalyst: Strategic?

Source: Catalyst Fund | Ministry of Business, Innovation & Employment

Introduction

The New Zealand Government's ten-year vision as set out in the National Statement of Science Investment is of a "highly dynamic science system that enriches New Zealand, making a more visible, measurable contribution to our productivity and wellbeing through excellent science".

International science and innovation connectivity is a key contributor to achieving this vision, providing opportunities to drive the increasing excellence and potential impacts of New Zealand science.

International collaboration on science and innovation: improves the quality of research; increases end-user relevancy of research and knowledge exchange; enables firms to increase investment in innovation activities, so increasing their stock of knowledge; and provides access to additional capability and resources, which increases domestic absorptive and delivery capacity.

The Catalyst Fund

The Catalyst Fund supports activities that initiate, develop and foster collaborations that leverage international science and innovation for New Zealand's benefit. The Catalyst Fund seeks to achieve the following objectives:

- targeted international partnerships which maximise the impact and quality of New Zealand science and innovation
- emerging international science cooperation opportunities are pursued and advanced to deliver benefits to New Zealand
- international science and innovation is leveraged in key areas, delivering benefit to New Zealand at a faster pace, of better quality, or of greater impact than can otherwise be achieved.

Catalyst funding is delivered through four instruments: Influence, Leaders, Seeding and Strategic.

- *Catalyst: Strategic* - funds strategic research partnerships and large-scale international collaborations
- *Catalyst: Seeding* - supports small and medium-sized new international partnerships
- *Catalyst: Leaders* - supports targeted international fellowships for exceptional individuals
- *Catalyst: Influence* - supports New Zealand's involvement in and influence of key international forums

This Call for Proposals invites applications for contestable funding under *Catalyst: Strategic*.

Catalyst: Strategic

Catalyst: Strategic funds strategic research and large-scale pre-research collaborations with priority partners and in targeted areas **that cannot be supported through other means**.

The objectives of *Catalyst: Strategic* are to:

- leverage international research infrastructure and capabilities in areas posing significant science-based challenges to New Zealand and our international partners
- profile New Zealand science and innovation, and our ability to contribute to global science challenges.

It is also expected that *Catalyst: Strategic* will support relevant activities that contribute to unlocking the innovation potential of Māori knowledge, resources, and people for the benefit of New Zealand, as outlined in Ministry of Business, Innovation, and Employment's Vision Mātauranga policy framework.

More information about the Catalyst Fund can be found on MBIE's website.

Appendix 2: MBIE's Funding policies, terms and conditions

Source: https://www.mbie.govt.nz/dmsdocument/28907-mbie-funding-policies-terms-and-conditions

The terms applying to this Fund are set out below. The terms and conditions are non- negotiable and do not require a response. Each applicant that submits a proposal will be deemed to have agreed to these terms and conditions without reservation or variation.

1. General

1.1 The terms and conditions are non-negotiable and do not require a response. Each applicant that submits a proposal (hereafter referred to as "you") will be deemed to have agreed to the Call for Proposals terms and conditions without reservation or variation.

2. Investigations and reliance on information

2.1 You must examine this Call for Proposals and any documents referenced by this Call for Proposals and carry out all necessary investigations before submitting a proposal. If you are in doubt as to the meaning of any part of this Call for Proposals, you must set out in your proposal the interpretation and any assumptions you used.

2.2 MBIE will not be liable (in contract or tort, including negligence, or otherwise) to anyone who relies on any information provided by or on behalf of MBIE in or in connection with this Call for Proposals.

3. Reliance by applicants

3.1 All information contained in this Call for Proposals or given to you by MBIE is for the purpose of allowing you to prepare your proposal. MBIE has endeavoured to ensure the integrity of such information. However, it has not been independently verified and may not be up to date.

4. Reliance by MBIE

4.1 MBIE may rely upon all statements you make in your proposal and in correspondence or negotiations with MBIE or its representatives. If a proposal is funded by MBIE, any such statements may be included in a funding contract.

4.2 You must ensure all information you provide to MBIE is complete and accurate. MBIE is under no obligation to check any proposal for errors, omissions, or inaccuracies. You must notify MBIE promptly upon becoming aware of any errors, omissions, or inaccuracies in your proposal or in any additional information you provide.

5. Inducements

5.1 You must not directly or indirectly provide any form of inducement or reward to any assessment panel member, officer, employee, advisor, or other representative of MBIE in connection with this Call for Proposals.

5.2 Business-as-usual communications (relating to funding under existing arrangements between MBIE and your organisation) will be maintained with the usual contacts. However, during the Call for Proposal process, you must not use business-as-usual contacts to solicit or discuss details of this Call for Proposals or any application you have, or intend to, submit, with any person at MBIE or its agents, including the assessment panel members.

6. Ownership and intellectual property

6.1 This Call for Proposals and any other documents MBIE provides to you remain the property of MBIE. All copyright and other rights in this Call for Proposals and in any other documentation

or information provided to you or any other person by or on behalf of MBIE in connection with this Call for Proposals will remain with, and belong at all times to, MBIE or its licensors.

6.2 MBIE may request at any time the immediate return of all documents supplied and any copies made of them. You must comply with any such request in a timely manner.

6.3 Any proposals or information you supply to MBIE will become the property of MBIE and may not be returned to you. Ownership of the Intellectual Property rights in a proposal does not pass to MBIE. However, in submitting a proposal, you grant MBIE a non-exclusive, non-transferable, perpetual licence to retain, use, disclose, and copy your proposal for any purpose related to this Call for Proposals process.

6.4 By submitting a proposal, you warrant that the provision to MBIE of the information contained in your proposal, and MBIE's use of it for the evaluation of your proposal and for any resulting negotiation, will not breach any third-party intellectual property rights.

7. Confidentiality

7.1 You and MBIE will each take reasonable steps to protect Confidential Information and, subject to paragraph 7.3, and without limiting any confidentiality undertaking agreed between them, will not disclose Confidential Information to a third party without the other's prior written consent.

7.2 You and MBIE may each disclose Confidential Information to any person who is directly involved in the Call for Proposals process on its behalf, such as officers, employees, consultants, contractors, professional advisors, evaluation panel members, partners, principals or directors, but only for the purpose of participating in the Call for Proposals.

7.3 You acknowledge that MBIE's obligations under paragraph 7.1 are subject to requirements imposed by the Official Information Act 1982 (OIA), the Privacy Act 2020, parliamentary and constitutional convention and any other obligations imposed by law. Where MBIE receives an OIA request that relates to your Confidential Information, MBIE will consult with you and may ask you to explain why the information is considered by you to be confidential or commercially sensitive.

8. The proposal process

8.1 Despite any other provision in this Call for Proposals, MBIE reserves the following rights:

- MBIE may amend, suspend, cancel and/or re-issue the Call for Proposals or any part of the Call for Proposals.
- MBIE may make any material change to the Call for Proposals (including any date) on the condition that you are given a reasonable time within which to respond to the change.
- In exceptional circumstances, MBIE may accept a late proposal where it considers that there is no material prejudice to other applicants.
- MBIE may waive irregularities or requirements in or during the Call for Proposals process where it considers it appropriate and reasonable to do so.
- Your proposal may not be approved for funding.
- All or any proposal(s) may be rejected.
- Your proposal may be accepted in whole, or in part.
- Any information you provide to MBIE with your proposal may be retained or destroyed.
- Clarification may be sought from any applicant(s) in relation to any matter in connection with the Call for Proposals process.
- Any applicant(s) may be contacted, which may be to the exclusion of any other applicant(s), at any time before or after the approval (if any) of proposal(s).
- MBIE may reject, or not consider further, any documentation related to your proposal that may be received from you, unless it is specifically requested.
- This Call for Proposals process may be run in such manner as MBIE may see fit.

9. No contractual obligations created

9.1 No contract or other legal obligations arise between you and MBIE out of or in relation to this Call for Proposals or Call for Proposals process, until a formal written contract (if any) is signed by both you and MBIE.

9.2 This Call for Proposals do not constitute an offer by MBIE to provide funding or enter into any agreement with you. The call for and receipt of proposals does not imply any obligation on MBIE to contract any funding requested in your proposal. MBIE will not be bound in any way until a formal written contract is executed.

9.3 MBIE makes no representations nor gives any warranties in this Call for Proposals.

9.4 Any verbal communications made during the Call for Proposals process will not be binding on MBIE and are subject to the terms of this Call for Proposals.

10. No process contract

10.1 Despite any other provision in this Call for Proposals or any other document relating to this Call for Proposals, the issue of this Call for Proposals does not legally oblige or otherwise commit MBIE to proceed with or follow the process outlined in this Call for Proposals or to assess your proposal or enter into any negotiations or contractual arrangements with you.

10.2 For the avoidance of doubt, this Call for Proposals process does not give rise to a process contract.

11. Exclusion of liability

11.1 Neither MBIE nor any assessment panel members, officers, employees, advisers or other representatives will be liable (in contract or tort, including negligence, or otherwise) for any direct or indirect damage, expense, loss or cost (including legal costs) incurred or suffered by you, your affiliates or any other person in connection with this Call for Proposals process, including without limitation:
the assessment process
the preparation of any proposal
any investigations of or by any applicant
concluding any contract
the acceptance or rejection of any proposal
the suspension or cancellation of the process contemplated in this Call for Proposals, or any information given or not given to any applicant(s).

11.2 By participating in this Call for Proposals process, you waive any rights you may have to make any claim against MBIE. To the extent that legal relations between MBIE and you cannot be excluded as a matter of law, the liability of MBIE is limited to $1.

11.3 Nothing contained or implied in or arising out of this Call for Proposals or any other communications to any applicant shall be construed as legal, financial, or other advice of any kind.

12. Costs and expenses

12.1 MBIE is not responsible for any costs or expenses incurred by you in the preparation of an application.

13. Governing law and jurisdiction

13.1 This Call for Proposals will be construed according to, and governed by, New Zealand law and you agree to submit to the exclusive jurisdiction of New Zealand courts in any dispute concerning this Call for Proposals or any proposal.

14. Disclosure of information

14.1 MBIE may make public the following information:
The proposal title

The name of the successful Host (the Contracting organisation)
The names of all sub-contracting organisations
The public statement (as provided in the proposal)
The public statements in the reports (if funded)
The total amount of funding provided, and a breakdown of funding by financial year
The NZ Government appropriation that the funding is sourced from
The investment round title from which the investment was made
The contract number (if funded)
The contract start and end dates (if funded)
The contract status (if funded)
Any Australian and New Zealand Standard Research Classification (ANZSRC) codes provided in the application (if funded)
The name(s) of the Principal Investigator(s) unless the Contractor or individual has requested these remain confidential

14.2 You must not release any media statement or other information relating to the process outlined in this Call for Proposals, or the submission or approval of any proposal to any public medium without providing sufficient advance Notice to MBIE.

Appendix 3: ANZSRC Codes

What are ANZSRC codes?

An ANZSRC (Australian and New Zealand Standard Research Classification) code is a standard classification that allows research and development activities to be categorised according to their intended purpose, outcome and/or discipline. See Australian Bureau of Statistics for more details.

ANZSRC is a hierarchical classification, with 2, 4, and 6 digit codes representing increasing specificity. For example:

82 Plant Production and Plant Primary Products
8201 Forestry
810104 Native Forests

Entering ANZSRC Codes

ANZSRC codes are categorised under two research classifications;

- **Field of Research (FOR) -** this is the discipline and/or the process or techniques used in the research.
- **Socio-Economic Objectives (SEO)** - this describes the intended purpose or outcome of the research undertaken.

Under each classification, **no more than four** ANZSRC codes must be specified.

Appendix 4: Technology Readiness Levels

What is Technology Readiness Level?

The primary purpose of using technology readiness levels (TRLs) is to help management in making decisions concerning the development and transitioning of technology. It should be viewed as one of several tools that are needed to manage the progress of research and development activity within an organization.

TRL Definitions

TRL 1	**Basic principles observed and reported.** Lowest level of technology readiness. Scientific research begins to be translated into applied research and development. Formulation of basic theories / principles which have the potential to be further developed into applied research. The project may be limited to literature review and fundamental investigations and paper studies.
TRL 2	**Technology concept and/or application formulated.** Once basic principles are observed, practical applications can be formulated. Conceptual development of application and technology. The project may involve analytic studies such as numerical simulations and experimentation to support the basic theories.
TRL 3	**Analytical and experimental critical function and/or characteristic proof of concept.** Active research and development initiated. Proof of concept established through laboratory studies which aim to validate analytical predictions of separate components of the technology. Examples include components that are not yet integrated or representative.
TRL 4	**Laboratory testing of prototype component or process.** Design, development and lab testing of technological components are performed. Lab-scale tests on the prototype where separate components of the technology have been integrated to establish that they will work together. This is a relatively "low fidelity" prototype in comparison with the eventual system.
TRL 5	**Laboratory testing of integrated system.** The basic technology components are integrated together with realistic supporting elements to be tested in a simulated environment. Bench-scale tests in a simulated environment (e.g., laboratories or other environment under controlled conditions) for optimisation/performance enhancement of the technology/prototype. This is a "high fidelity" prototype system verified.
TRL 6	**System/subsystem model or prototype demonstration in a relevant environment.** The prototype, which is well beyond that of level 5, is tested in a relevant environment. Pilot-scale tests of the system or process demonstration in a relevant operational environment and the prototype system verified.
TRL 7	**System prototype demonstration in an operational environment.** Prototype is near, or at, planned operational system level. Demo-scale tests in the actual operational environment. The final design is virtually complete. The goal of this stage is to remove engineering and manufacturing risk.
TRL 8	**Actual system completed and qualified through test and demonstration.** Technology has been proven to work in its final form under the expected conditions. Successful implementation of demo-scale tests where true system development is achieved. In most of the cases, this level represents the end of true system development.
TRL 9	**System ready for full-scale deployment.** The technology in its final form is ready for commercial deployment.

Source: https://www.ncbi.nlm.nih.gov/books/NBK201356/