



SCIENCE, INNOVATION AND TECHNOLOGY WEEKLY REPORT

| | | | |
|--|---|-------------------------|-----------------|
| Week ending: | 20 September 2024 | Priority: | Routine |
| Security classification: | In Confidence | Tracking number: | 2425-0543 |
| Minister | Action sought | | Deadline |
| Hon Judith Collins KC Minister of Science, Innovation and Technology | Agree continued funding up to \$5 million per annum through SSIF for an advanced genomics platform until 30 June 2030. Note this week's content. | | N/A |

Jessica Taylor
Manager Technology and Innovation Policy
Programmes
18 / 09 / 2024

Hon Judith Collins KC
Minister of Science, Innovation and Technology
..... / /

Minister's comments:

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IN CONFIDENCE



Science, Innovation and Technology Weekly Report

To Hon Judith Collins KC
Minister of Science, Innovation and Technology

Week ending 20 September 2024

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For Decision

Advanced Genomics Platform – Continued Investment Decision

Contact: Trevor Drage

We are seeking your direction on continued funding for an advanced genomics platform through the Strategic Science Investment Fund (SSIF). As Minister of Science, Innovation and Technology (SI&T), you provide the direction for current and future investments made through the SSIF.

Since 2017, Government has invested \$5 million per annum in a collaborative advanced genomics platform through the SSIF with the purpose of building long-term national capability and capacity for genomics and bioinformatics. The current contract ends 31 December 2024.

We recommend you support continued investment in an advanced genomics platform through SSIF Infrastructure until 30 June 2030 as this will:

- Deliver on Government priorities to realise economic/commercial impact through a biotech economy.
- Ensure New Zealand has the capability to participate and lead in the rapidly developing fields of genomics and bioinformatics.
- Enable new genomics tools and techniques to be developed in the fields of health, environment and primary production.
- Facilitate new cross-sector research partnerships domestically and internationally.

s 9(2)(f)(iv) This investment is well aligned with your priorities. s 9(2)(f)(iv)

MBIE is the decision maker for SSIF investments. If you support continued funding for an advanced genomics platform, we will negotiate a new contract with the University of Otago, who are the hosts of the current platform ('Genomics Aotearoa').

We recommend you:

- **Agree** to continued funding up to \$5 million per annum through SSIF for an advanced genomics platform until 30 June 2030.

Agree / Disagree / Discuss

- **Note** that, subject to your agreement above, MBIE will negotiate a new contract with the University of Otago for approval by the Deputy Secretary LSE.

Noted

- **Note** you are scheduled to meet with the Genomics Aotearoa governance board on 22 October which is an opportunity for you to share your priorities for the science system.

Noted



Event Briefing

Genomics Aotearoa, 22 October 2024

| | | | |
|---------------------------------|-----------------|-------------------------|-----------|
| Date: | 16 October 2024 | Priority: | Low |
| Security classification: | In Confidence | Tracking number: | 2425-0969 |

| Action sought | | |
|---|--|-----------------|
| | Action sought | Deadline |
| Hon Judith Collins KC Minister of Science, Innovation and Technology | Meet with the leadership of the SSIF Infrastructure Platform 'Genomics Aotearoa', at your office | 22 October 2024 |

| Contact for telephone discussion (if required) | | | |
|--|--|-----------|-------------|
| Name | Position | Telephone | 1st contact |
| Trevor Drage | Manager, Strategic Investments | s 9(2)(a) | ✓ |
| s 9(2)(a) | Senior Investment Manager, Specialised Investments | s 9(2)(a) | |

| The following departments/agencies have been consulted |
|--|
| |

Minister's office to complete:

Approved

Declined

Noted

Needs change

Seen

Overtaken by Events

See Minister's Notes

Withdrawn

Comments

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EVENT BRIEFING

Title

| | | | |
|---------------------------------|-----------------|-------------------------|-----------|
| Date: | 16 October 2024 | Priority: | Low |
| Security classification: | In Confidence | Tracking number: | 2425-0969 |

Purpose

You have agreed to meet with the leadership of Genomics Aotearoa, in your office, at 3 – 3.30pm on Tuesday 22 October 2024.

This briefing provides logistical and background details to support your meeting.

Recommendations

The Ministry of Business, Innovation and Employment recommends that you:

- a **Note** the background to the Genomics Aotearoa SSIF Platform

Noted

- b **Note** the meeting details, including time and attendees

Noted

Trevor Drage
Manager, Strategic Investments
Science System Investment and Performance, MBIE

15 / 10 / 2024

Hon Judith Collins KC
**Minister of Science, Innovation and
Technology**

..... / /

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Background

1. Genomics Aotearoa (GA) is a collaborative research platform (the Platform) established in 2017 to build New Zealand's long-term genomics and bioinformatics talent base and infrastructure. The goals of the Platform are to:
 - a. Establish an agile, leading-edge collaborative platform of research on genomics that establishes new connections in the New Zealand genomics sector and with genomics research end-users;
 - b. Grow genomics capability in New Zealand through excellent genomics research;
 - c. Grow new science collaborations with genomics research centres, networks and teams that are doing world-leading work; and
 - d. Increase the adoption and impact of genomics technology for scientists, relevant end-users and their sectors.
2. Hosted by the University of Otago, the Platform is a consortium of 10 partner organisations and 34 associate organisations, both domestic and international. This includes universities, Crown Research Institutes, Centres of Research Excellence, Independent Research Organisations and publicly listed and privately held companies.
3. The Platform has established national collaborations in areas of health, environment and primary production, funding projects across these three key research themes. Projects provide the research sector and end-users with the skills and tools needed to establish internal capability to deliver genomics initiatives within their own organisations.
4. The Platform is managed through a Strategic Science Investment Fund (SSIF) – Infrastructure investment contract and has a current end date of 31 December 2024. To date, the Platform has received \$39.75 million (excluding GST).
5. In September 2024, you confirmed support for continued investment in an advanced genomics platform with funding of up to \$5 million per annum, from 1 January 2025 to 30 June 2030. This was conditioned with the investment being more aligned to current government priorities, particularly the advancement of biotechnology and commercialisation of science (Weekly Report 2425-0543 refers).
6. The Platform has been informed of your decision and MBIE is in the early stages of negotiating a contract variation to the existing Genomics Aotearoa Platform contract with the University of Otago, extending their funding at \$5 million per annum through June 2030.
7. Continued investment in the Platform will:
 - a. maintain established national research collaborations and genomics capability in the fields of health, environment and primary production.
 - b. enable New Zealand's capacity to deliver in the rapidly developing fields of genomics and bioinformatics; and
 - c. support the delivery of your wider priorities for biotechnology, such as synthetic biology and gene technology (including commercialisation), without requiring substantial change to the existing investment.
8. Continued investment presents an opportunity to adjust the Platform's focus toward developing key areas required for a biotechnology economy, through:
 - a. a renewed outcome logic and five-year work programme incorporating SI&T priorities
 - b. revising the Platform's governance board to include more commercial or biotechnology expertise; and
 - c. new economic/commercial impact key performance indicators.

Meeting at your office, 3 – 3.30pm 22 October 2024

9. On 13 August 2024 (prior to your decision to extend funding for an advanced genomics investment), the Genomics Aotearoa Platform Governance Group Chair wrote to you, requesting a meeting (letter attached in Annex One).
10. This letter and meeting request sought to impress on you the important work the Platform had been doing, and to advocate for extended funding. MBIE officials advised your office of the pending decision on future funding, and recommended you accept the meeting invite, but to schedule it for after a decision had been made.
11. As such, the meeting purpose has shifted from advocating for future funding, to opening a discussion on the direction of the Platform through 2030. This is an opportunity for you to describe your priorities for the wider science and technology system, and how a renewed Genomics Aotearoa Platform will work within it. The Platform leadership will then have an opportunity to discuss with you, how best to select or shape their activities, to meet your priorities.
12. Genomics Aotearoa have prepared some discussion points for your meeting, covering:
 - a. their background as a PlatformHow they may support growing the biotechnology based economy, using:
 - b. Precision health
 - c. Rapid genomic testing for communicable diseases
 - d. Health equity
 - e. New tools to combat the effects of climate change in primary production
 - f. Artificial intelligence for improved animal breeding programmes
 - g. Environmental monitoring
 - h. Biosecurity
 - i. Conservation of endangered species

Areas of alignment between Genomics Aotearoa and your priorities for the science and technology system

13. Genomics Aotearoa develops and supports New Zealand's capability in genomics and bioinformatics – two key focus areas for biotechnology development. These capabilities are particularly important in achieving novel outcomes from genetic technologies.
14. The Platform has supported impactful research for the livestock breeding industry, precision medicine, fishing, and other areas where biotechnology can be used for commercial gains.
15. Through Genomics Aotearoa's timeline, MBIE and independent reviews have encouraged them to become more streamlined in their approach to prioritisation. Through the current reinvestment process, MBIE are pushing for heightened commercialisation outcomes from their research, and strong ties to biotechnology industries.
16. Suggested talking points to support your discussion are provided in Annex Two.

About the audience

17. You will meet with the Platform Governance Group Chair, Dr William Rolleston CNZM, and Platform Co-Directors, Professor Peter Dearden and Professor Mik Black. Short biographies are attached in Annex Three.

Risks and mitigations

18. This meeting is low risk, as the Platform has been confirmed for, and informed of future funding. This meeting is primarily for you to inform them of your priorities for their work in the coming years and for the Platform to discuss how they will be able to meet those priorities.

Logistics

19. The meeting will be held in your office. Platform administration is in contact with staff in your office to arrange the details.

Communications / Media

20. No communications or media are expected or planned for this meeting.

Contacts

| Name | Position / organisation | Telephone |
|-------------------|-------------------------------------|-----------|
| William Rolleston | Governance Chair, Genomics Aotearoa | s 9(2)(a) |
| Mik Black | Co-Director, Genomics Aotearoa | s 9(2)(a) |
| Peter Dearden | Co-Director, Genomics Aotearoa | s 9(2)(a) |

Annexes

- Annex One: Letter from Genomics Aotearoa to the Minister of Science, Innovation & Technology, 13 August 2024
- Annex Two: Suggested talking points
- Annex Three: Biographies of attendees

Annex One: Letter from Genomics Aotearoa to the Minister of Science, Innovation & Technology, 13 August 2024



13 August 2024

The Hon. Judith Collins,
Minister of Science, Innovation and Technology,
Parliament Buildings,
Wellington.

Dear Minister,

Re **Genomics Aotearoa Platform**

We seek a face-to-face meeting with you this month to appraise you of the work of Genomics Aotearoa, to meet its leadership and to discuss its future in a modern New Zealand. With the changes in the regulation of genetic technologies flagged by your government we are also interested to hear your aspirations and priorities in this area.

Genomics Aotearoa was established seven years ago with the aim of building national capacity and capability in genomics and bioinformatics. During this time we have delivered key genomics infrastructure resources across the health, primary production and conservation domains, as well as building strong international linkages to ensure New Zealand remains at the cutting edge of this fast-moving technology.

Our current contract with MBIE finishes in December 2024. As you can appreciate, this timeline has created significant uncertainty which is resulting in the loss of vital talent at this critical moment and this risk is ongoing.

Genomics sits at the heart of the biotech revolution and is a key enabler for our future in biology, personalised medicine, predator control, species conservation and the primary sector. Of note, Genomics Aotearoa has developed capability in both gene editing and artificial intelligence, and we are excited by the potential for these techniques to drive growth when combined with recent technological advances in genomics, bioinformatics and synthetic biology.

To this end we would like to meet with you to ensure that Genomics Aotearoa remains well-aligned with the Government strategy on biotechnology and to discuss any specific priorities that you have in this space.

To maintain our national momentum, we have taken the step to develop a forward-looking strategy - Genomics for the Future of Aotearoa New Zealand, which we attach for your information.

We look forward to hearing from you.

Yours sincerely

A handwritten signature in black ink that reads 'William Rolleston'.

Dr William BR Rolleston CNZM
Chair
Genomics Aotearoa

Genomics Aotearoa
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2425-0969
genomics-aotearoa.org.nz



Annex Two: Suggested Talking points

You recently agreed to continued funding for a genomics platform, which MBIE is actioning through the extension of the GA contract with modifications to better reflect Government priorities of biotechnology advancement and commercialisation of science.

You may wish to ask the Platform:

- *What changes to the platform they intend to implement to support these priorities?*
- *What existing industry connections has the Platform used to implement outcomes of its research?*
- *What lessons has the Platform learned from its first seven years of operation? What will it do differently in this new investment?*
- *What industries does the Platform see growing in New Zealand that could then provide pathways for impact from Platform research?*
- *How does the Platform plan to work with other Science, Innovation & Technology investments, to support a growing biotechnology economy in New Zealand?*
 - *Of note are the RNA SSIF Platform, the Health Research Council's revised investment plan, the Applied Doctorates scheme, the New Zealand Agricultural Greenhouse Gas Research Centre (co-funded by MPI), and investments in the Crown Research Institutes.*

Genomics Aotearoa have provided their strategy document to MBIE and to your office. Relating to this, the Platform has prepared discussion points on the following areas, which you may wish to explore:

- *Growing the economy through building a strong biotech sector*
- *Human health related advances in genomics including:*
 - *Precision health*
 - *Rapid genomic testing for communicable disease*
 - *Health equity*
- *Advances in primary production enabled by genomic technology, including:*
 - *Adaptation and mitigation of climate change in primary production*
 - *Artificial intelligence for improved breeding programmes*
- *More effective and efficient environmental management*
 - *Environmental monitoring tools*
 - *Biosecurity screening*
 - *Conservation of endangered species*

You may wish to ask:

- *What areas of your proposed strategy include developing or using gene editing?*
- *What are the barriers you see to using gene editing applications in New Zealand?*
- *What areas of the Genomics Aotearoa strategy will support New Zealand's ability to implement gene editing in the near future?*
- *Within the proposed strategy, how much focus and resources will you commit to each area of human health, primary production, and environmental management?*

With changes planned for the science sector, based on advice from the Science System Advisory Group, the Platform leadership has considered how best to work within a changing system.

You may wish to ask the Platform:

- *What connections does the Platform have across the science system, with different research institutes, and in particular, CRIs?*
- *How have Platform partners worked with seed and commercialisation funders or incubators, such as Otago Innovation, Kiwinet, etc?*
- *Has the Platform and its partner organisations felt well connected to Government priorities? Has the Platform understood its role within the Science system?*

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Annex Three: Biographies of attendees

| | |
|---|--|
| <p>Professor Peter Dearden</p>  | <p>Head of Department – Biochemistry, the University of Otago, 2024 recipient of the Distinguished Chair, Poutoko Taiea award.</p> <p>Professor Dearden’s expertise includes genetics and genomics, with work in gene editing and gene drives. He is an expert on the honey bee and works closely with the beekeeping industry in New Zealand.</p> <p>Professor Dearden has been the Director of Genomics Aotearoa since its inception in 2018.</p> |
| <p>Professor Mik Black</p>  | <p>Professor of Bioinformatics, Department of Biochemistry, the University of Otago. Professor Black is a member of the Centre for Translational Cancer Research.</p> <p>Professor Black’s research focus has been on using statistics and computational tools on large datasets. He uses this to support biomolecular research, and particularly on human diseases such as cancer, but also for applications in other areas such as agriculture.</p> <p>Professor Black was appointed as Co-Director of the Genomics Aotearoa Platform in May 2023.</p> |
| <p>Dr William Rolleston CNZM</p>  | <p>Dr William Rolleston is the co-founder of the biotechnology and vaccine manufacturing company South Pacific Sera Limited and chair of Genomics Aotearoa. Dr Rolleston is also a member of the Science System Advisory Group.</p> <p>Dr Rolleston has a degree in medicine and has received many awards and accolades for his contribution to biotechnology, business, farming and the community.</p> <p>He was the founding chair of Aotearoa New Zealand’s biotechnology industry association (now Biotech NZ), and the Life Sciences Network, as well as president of both New Zealand Federated Farmers and the World Farmers Organisation. Dr Rolleston has also served many roles as an advisor to central and local government.</p> |



BRIEFING

SI&T Investment Portfolio Update

| | | | |
|---------------------------------|-------------------|-------------------------|-----------|
| Date: | 10 September 2024 | Priority: | Low |
| Security classification: | In Confidence | Tracking number: | 2425-0825 |

| Minister | Action sought | Deadline |
|---|---|-------------------|
| Hon Judith Collins KC MP Minister of Science, Innovation and Technology | Note the funds and investments within the SI&T portfolio and key upcoming decision points for these funds. | 17 September 2024 |

| Contact for telephone discussion (if required) | | | |
|--|---|-----------|-------------|
| Name | Position | Telephone | 1st contact |
| Joanne Looyen | Director, Science System Investment and Performance | s 9(2)(a) | ✓ |
| s 9(2)(a) | Principal Policy Advisor, Science System Policy | s 9(2)(a) | |

| The following departments/agencies have been consulted |
|--|
| |

Minister's office to complete:

- | | |
|---|--|
| <input type="checkbox"/> Approved | <input type="checkbox"/> Declined |
| <input type="checkbox"/> Noted | <input type="checkbox"/> Needs change |
| <input type="checkbox"/> Seen | <input type="checkbox"/> Overtaken by Events |
| <input type="checkbox"/> See Minister's Notes | <input type="checkbox"/> Withdrawn |

Comments

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BRIEFING

SI&T Investment Portfolio Update

| | | | |
|---------------------------------|-------------------|-------------------------|-----------|
| Date: | 10 September 2024 | Priority: | Low |
| Security classification: | In Confidence | Tracking number: | 2425-0825 |

Purpose

To provide you with an overview of the key funds and investments within your portfolio, their objectives, and outline key upcoming Ministerial input points and decisions for these investments.

Recommended action

The Ministry of Business, Innovation and Employment recommends that you:

- a **Note** the funds and investments within the SI&T portfolio and key upcoming decision points for these funds.

Noted

Joanne Looyen
**Acting General Manager, Science System
Investment and Performance**
Labour Science and Enterprise, MBIE

10 / 09 / 2024

Hon Judith Collins KC
**Minister of Science, Innovation and
Technology**

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Key SI&T Funds, Investment Processes and Ministerial Input

1. MBIE manages 21 investments in the SI&T portfolio. As Minister of SI&T you agree the policy settings, and MBIE officials design and deliver the investment processes aligned to those settings.
2. Since you became Minister of SI&T, we have provided you with advice on upcoming investments as they have arisen and checked the policy direction before proceeding. This briefing provides you with a summary of those decisions, as well as upcoming investments so that you have a complete picture of key decision points in the portfolio.
3. Annex One provides a portfolio view of your funds, their policy intent, recent decisions you have made, upcoming Ministerial decisions, updates and announcements.
4. The investment processes that require your approval and possible announcement opportunities before the end of this calendar year include:
 - a. Out of Scope
 - b. Out of Scope
 - c. Genomics Aotearoa update on a funding extension
 - d. Out of Scope
 - e. Out of Scope
 - f. Out of Scope
 - g. Out of Scope
5. MBIE officials can provide further information on specific funds, their investment processes and Ministerial input points if required.
6. At the request of your office, we have also provided examples of funded projects (Annex Two).

Annexes

Annex One: Table of Investment Process Updates

Annex Two: Examples of Funded Projects

Annex One: Table of Investment Process Updates

| Fund + 24/25 Appropriations | Policy Intent | Ministerial decisions on policy settings | Upcoming Investment rounds |
|--|---|--|--|
| Out of Scope | [Redacted] | [Redacted] | [Redacted] |
| [Redacted] | [Redacted] | [Redacted] | [Redacted] |
| [Redacted] | [Redacted] | [Redacted] | [Redacted] |
| [Redacted] | [Redacted] | [Redacted] | [Redacted] |
| [Redacted] | [Redacted] | [Redacted] | [Redacted] |
| [Redacted] | [Redacted] | [Redacted] | [Redacted] |
| [Redacted] | [Redacted] | [Redacted] | [Redacted] |
| [Redacted] | [Redacted] | [Redacted] | [Redacted] |
| Strategic Science Investment Fund Infrastructure - Genomics Aotearoa | This is a collaborative research platform to build New Zealand’s long-term capability and capacity for genomics and bioinformatics. | We will provide you with advice in September 2024, seeking your agreement to extend funding for the platform for a further five years. | If you agree to continue to fund Genomics Aotearoa we will negotiate a platform plan up to five years in duration and contract with the host organisation. |

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| Fund + 24/25 Appropriations | Policy Intent | Ministerial decisions on policy settings | Upcoming Investment rounds |
|-----------------------------|---------------|--|----------------------------|
| Out of Scope | [Redacted] | [Redacted] | [Redacted] |
| [Redacted] | [Redacted] | [Redacted] | [Redacted] |
| [Redacted] | [Redacted] | [Redacted] | [Redacted] |
| [Redacted] | [Redacted] | [Redacted] | [Redacted] |
| [Redacted] | [Redacted] | [Redacted] | [Redacted] |
| [Redacted] | [Redacted] | [Redacted] | [Redacted] |
| [Redacted] | [Redacted] | [Redacted] | [Redacted] |
| [Redacted] | [Redacted] | [Redacted] | [Redacted] |

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| Fund + 24/25 Appropriations | Policy Intent | Ministerial decisions on policy settings | Upcoming Investment rounds |
|-----------------------------|---------------|--|----------------------------|
| Out of Scope | [Redacted] | [Redacted] | [Redacted] |
| [Redacted] | [Redacted] | [Redacted] | [Redacted] |
| [Redacted] | [Redacted] | [Redacted] | [Redacted] |
| [Redacted] | [Redacted] | [Redacted] | [Redacted] |

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Annex Two: Examples of Funded Projects

Out of Scope

- █ [REDACTED]

- █ [REDACTED]

[REDACTED]

- █ [REDACTED]

- █ [REDACTED]

- █ [REDACTED]

Strategic Science Investment Fund Infrastructure

- Genomics Aotearoa has supported 264 researchers across 35 genomics projects and delivered 97 training courses, upskilling 2,004 researchers in genomics / bioinformatics techniques. The Platform has substantially developed New Zealand's capability for genomics by growing a skilled workforce, creating tools, partnering scientists with end-users and forming domestic and international collaborations. This capability enables wider productivity through the uptake and utilisation of genomic technologies across organisations and sectors.

- Out of Scope [REDACTED]

Out of Scope

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

[Redacted]

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[Redacted]

[Redacted]

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MINISTERIAL BRIEFING PAPER

TO: Hon. Judith Collins KC, Minister for Science, Innovation & Technology

FROM: Prof Peter Dearden, Co-Director, Genomics Aotearoa
Prof Mik Black, Co-Director, Genomics Aotearoa
Dr William Rolleston, Chair, Genomics Aotearoa

DATE: Tuesday, 15th October 2024

SUBJECT: Genomics Aotearoa

INTRODUCTION

Genomics Aotearoa (GA), formed in 2017 and hosted by the University of Otago, is a science platform funded by Vote Science through the Strategic Science Investment Fund. The fund is administered by MBIE.

GA's core purpose is to develop national capability in genomics and bioinformatics. Genomics studies all of the DNA in an organism, and bioinformatics is a key tool, combining computing and data analysis to make sense of large amounts of genetic data.

Earlier this month you, as Minister for Science, agreed to extend GA's funding for a further 5.5 years, asking us to increase our focus on:

- Enabling genomic research which has the potential to deliver economic benefits to New Zealand.
- Research and capability development delivering on the Government's priorities for biotechnology.
- A strategy-led approach to research prioritisation to ensure the entirety of the Platform is delivering on the priorities above.

This briefing paper sets out background information on our programme, future opportunities for New Zealand, and potential roadblocks/constraints which may impede the delivery of the Government's priorities and realization of the benefits.

BACKGROUND

Over the past seven years GA has delivered science infrastructure across three broad areas: health, environment and primary production. Strategically we have focused on those aspects which are unique to New Zealand - our biodiversity, our primary production systems and our Māori and Pacific populations - building on the heavy lifting undertaken by other nations.

GA has selected and supported projects which build critical science infrastructure through world-class scientific research to provide ongoing access to new tools and techniques for New Zealand.

Projects supported by GA include:

- Developing leading-edge tools to ensure the generation of high-quality genomic information for our production and indigenous species.
- Using genomic information and artificial intelligence to improve the breeding values of our production plants and animals, and enhance conservation and species management efforts.
- Utilising DNA which circulates freely in the blood of cancer patients to better diagnose, monitor and treat disease.
- Developing a catalogue of Māori genetic variation to ensure equitable precision healthcare.
- Using genomic sequencing to diagnose and track infections, as was done with COVID-19
- Building tools and resources to allow better stewardship of genomic data, and to enable Indigenous data sovereignty, where appropriate.
- Developing freely available analysis tools and processes to accelerate the uptake of genomics and bioinformatics within the New Zealand science sector.

GA has enhanced the capacity of people in the genomics sector through:

- Developing project teams comprising New Zealand's leading genomics and bioinformatics researchers, who provide expertise, leadership and mentoring alongside the early career researchers who will form the next generation of our scientific workforce.
- Building an extensive training programme that has delivered over 100 workshops to more than 2,000 participants across the science sector since 2019.

GA's current projects and capability development activities are outlined in further detail in our [2024 Annual Report](#) (Dropbox link).

OPPORTUNITIES

Genomics and bioinformatics are key drivers of biotechnology-fuelled economic, social and environmental benefit. As we begin our next phase of operations, GA will continue its work to explore and develop opportunity for:

Health

- Internationally there has been a rapid move towards population-scale genome sequencing to enable precision healthcare. GA will deliver the key research that is needed for successful clinical implementation of genomics-guided healthcare in New Zealand. For example:
 - Precision healthcare for cancer, whereby we can build an understanding of the genetic makeup of the patient and their tumour cells, so the right drugs can be used, and the right therapies deployed.
 - Genomics provides vital quality control of manufactured solutions such as CAR T-cell therapy, CRISPR and RNA therapies.
- These developments will save taxpayer money by providing more effective treatments at affordable cost and ensuring the treatments are most appropriate for the individual patient, leading to faster recoveries and more productive outcomes.

- The response to the COVID pandemic indicated the value of tracing infectious disease using genomics, and GA researchers were at the forefront of NZ's genomics response. Our ongoing work in this space will generate cost effective tools for early detection and monitoring of disease incursions in humans and animals, allowing more rapid, extensive and accurate understanding of and effective response to emerging diseases.

Primary Production

- Climate change will require NZ's primary producers to reduce emissions, change land-use, and cope with increasingly severe weather events.
- Genomics can help us identify traits in our production animals which may help them cope with a changing climate. Further, gene editing and the use of artificial intelligence has the power to ensure those traits are present in our elite breeds and plant cultivars. In the same way, genomics will also enable us to reduce the environmental footprint of our primary production systems. The result will be reduced carbon liabilities, an enhanced reputation on which to sell our products and a more efficient and adaptive primary sector.

Environment

- New tools and technologies are urgently needed to detect, monitor and mitigate the rapid biological changes produced by climate change. An illustrative example of what is already being achieved is the the analysis of environmental DNA (eDNA) – identifying the many different species present in a single sample. This is enabling farmers to measure the biodiversity on their land, and will provide a powerful means to monitor the effects of climate change on environmental health.
- Developing genomic monitoring tools such as eDNA that are cheaper and more accessible will unlock their potential to inform strategies for environmental remediation, detect change events, and inform future land-use.
- Genomic tools will support improved biosecurity monitoring for both the detection and tracing of pests and will support research into tools for their eradication.
- New tools and technologies are required to support the use of genomics in conservation. For example, the development of reference genomes for all our endemic and taonga species, to provide baseline data for their conservation.

Working with traditional and new sectors

- GA already works with many agencies in health, conservation and the primary sector across the country. Many of our projects are deeply embedded with iwi because we realise with few resources we must focus on those things which are unique to New Zealand – our native flora and fauna and our Māori and Pacific communities. This builds on international work and enables New Zealand to make a unique and valuable contribution – for example, our work on kākāpō genomics was recently featured in a number of highly-ranked international scientific publications.
- Genomics is a key enabler of the RNA and gene editing revolutions and will increasingly rely on artificial intelligence to deliver outcomes in these spaces.

Further details of potential work to be undertaken by GA can be found in the document [Genomic Futures for Aotearoa New Zealand](#) (Dropbox link).

CONSTRAINTS

Legislative / Regulatory hurdles

- Genomics and biotechnology work in NZ is challenged by unsolved issues around Wai 262, Indigenous data sovereignty and genetic/genomic privacy. GA is interested and prepared to assist the Government in addressing these issues.
- A key output of genomics is biotechnology, including the use of genetic technologies. We acknowledge that the government is reviewing the laws on genetic technologies and agree that, done properly, the Australian model, which is designed to manage risk, will enable science to progress and opportunities to be realized.

Liability

- On the issue of liability, the Australian Office of the Gene Technology Regulator has stated:

“...the [Gene Technology] Act has as its object the protection of human health and the environment. It does not deal with liability relating to marketing, trade, or other matters. These issues were to be addressed in the courts via civil actions...”
- Special liability regimes will have a chilling effect on innovation, commercialization and use, including our ability to deploy effective cancer treatments and tools to combat and adapt to climate change. In particular, part 7A of HSNO which imposes pecuniary penalties and civil liability was introduced by the Labour/Greens Government in 2003 at the height of the GM debate in New Zealand and is considered no longer fit for purpose.

Funding:

- We appreciate the current fiscal constraints, and in that light we are grateful for the Government’s vision in extending GA’s mandate until 2030. We acknowledge that our plans set out in the accompanying strategy document will need to be tailored to fit this allocation.
- It is well known that investment in science leads to increased wealth. In the same way investment in genomics and the other leading edge sciences is an investment in the future, not an indulgence of rich nations. We would hope that the government, when fiscal conditions allow (or in spite of them), will look to further build on the investment it has already made in genomics as a reflection of the fundamental role it will play in our future prosperity. We will also look for opportunities to work with the private sector to deploy and commercialise the results of our work.
- To provide context, GA is aware of the following recent investments in genomics:

| | Annual Spend (NZD) | Adjusted for population (NZD) |
|--------------------------|---------------------------|--------------------------------------|
| New Zealand | \$ 5 M | \$ 5 M |
| Genome Canada | \$ 40 M | \$ 9.5M |
| Singapore (health only) | \$ 50 M | \$ 45 M |
| Australian (health only) | \$ 55 M | \$ 10 M |

EDUCATION/INFORMATION

Finally, we acknowledge that genomics is a technically challenging area of science with limited knowledge prevalent in the wider community, but also likely Parliament itself. GA would be more than happy to discuss how we might take part in an educational programme to ‘close the knowledge gap’ of the sector, enabling parliamentarians to become appropriately informed to aid with decision-making on this topic in the future.