



**NEW ZEALAND**

# **Industrial biotechnology industry in New Zealand**

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## **Overview**

Industrial biotechnology and its environmentally friendly, renewable and cost competitive spin-offs are becoming increasingly sought after.

New Zealand has always shown strong ability in plant biotechnology focused on the agricultural sector but is now gaining recognition for its innovations in industrial biotech.

Research and development have yielded world firsts in identifying and applying plants, microbes and enzymes to create new solutions in fuels, power cells and industrial chemicals.

LanzaTech's transformative technology enables the production of low-cost transport fuel from industrial waste gases and other waste resources. Industrial flue gases are an inherently low cost, high volume, point location resource, produced in most industrialised regions.

LanzaTech's mission is to enable industries that produce high volumes of carbon monoxide containing flue gases to become the lowest cost, highest volume producers of fuel ethanol.

## **Fast facts**

- Biotechnology contributes NZ\$300 million to NZ\$400 million per year to the New Zealand economy through the primary sector.
- Industrial applications represent 19 percent of expenditure and 14 percent of employment within New Zealand's biotechnology industry.
- The most common biotechnologies used in New Zealand are those used in processing and manufacturing.



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### **International innovations**

#### **LanzaTech**

LanzaTech's potentially world-changing technology enables the production of low-cost transport fuel from industrial waste gases and other waste resources. The company has developed a novel fermentation process in which bacteria consume carbon monoxide and produce ethanol.

LanzaTech has recently been awarded NZ\$12 million by the Foundation for Research, Science and Technology's Low Carbon Energy Technologies fund based on its potential to reduce carbon emissions. The company has also attracted NZ\$9 million in series A investment from a consortium led by the United States venture firm Khosla Ventures.

#### **Biopolymer Network**

A collaboration between three major Crown Research Institutes, the Biopolymer Network aims to create technology advances that will transform the outputs of primary production systems into a range of high performance products for industrial applications. AgResearch, Scion, and Crop and Food Research have complementary strengths across textile and keratin protein science; fibre refining and processing; and biopolymers and biomaterials. The current research focus is on creating new speciality biopolymers and chemicals.

### **International collaborations**

#### **ZyGEM**

ZyGEM is a world leader in isolating enzymes sourced from microorganisms living in extreme environments and has a proprietary collection of more than 1,500 extremophile organisms. ZyGEM currently has three product lines dedicated to DNA extraction – prepGEM™, forensicGEM™ and livestockGEM™ – and has created a broad range of applications for these unique enzymes across forensics, genetic testing, human diagnostics, biofuels, agronomics and biodefence. ZyGEM recently partnered with Diagenotec to produce molecular diagnostics for detecting infections in salmon and other fish, and Commonwealth Biotechnology Inc in the area of forensics testing.

#### **Scion, AgResearch and Carter Holt Harvey**

New Zealand Crown Research Institutes Scion and AgResearch teamed up with United States biofuels developer Verenium Corporation and Australasia's leading forest products company Carter Holt Harvey, to determine whether a biofuel industry based on New Zealand grown softwood feedstocks was possible. Research findings concluded it was viable, and now Scion, Verenium and Carter Holt Harvey are considering opportunities to utilise the existing pulp and paper infrastructure in New Zealand. The collaboration is also considering Verenium's proprietary enzyme technologies to convert wood and wood waste into sugars, which can then be fermented and refined into ethanol.



## **NEW ZEALAND**

### **Sustainability achievements**

#### **[Nutrizeal](#)**

Nutrizeal manufactures bioactive ingredients for natural medicines. It operates a supercritical fluid extraction plant, which is a solvent residue free method of extracting oils and resins from biomass. Nutrizeal is at the forefront of using this technology to extract and concentrate natural bioactive compounds. Nutrizeal's particular focus is on extracting bioactive polar lipids – especially phospholipids – from marine sources, which have been shown to be a more bioavailable and effective source of omega-3 than regular fish oil.

### **Industry contacts**

#### **[NZBio](#)**

NZBio is an incorporated society representing the New Zealand biotechnology sector.

#### **[Foundation for Research, Science and Technology](#)**

The Foundation for Research, Science and Technology (FRST) is a Crown entity that invests in science and technology research on behalf of the government, seeking benefits to New Zealand's economy, environment and society.

#### **[Ministry of Research, Science and Technology](#)**

The Ministry of Research, Science and Technology (MORST) manages the government's research, science and technology investment, provides policy advice and encourages innovation and commercialisation of scientific and technological knowledge and ideas.

#### **[Natural Products New Zealand](#)**

Natural Products New Zealand's mission is to raise New Zealand's profile as a source of quality natural products and complementary health products, and foster the development of a sustainable natural products industry.

#### **[New Zealand Trade and Enterprise](#)**

New Zealand Trade and Enterprise (NZTE) is the government's national economic development agency and works with the industrial biotechnology industry to build up its capability and increase its international connections.