

## Science & Technology





Tasmania

#### BACKGROUND

In 2000, the Tasmanian Government developed Tasmania *Together*, which is Tasmania's long-term social, economic and environmental vision that was developed by an extensive consultation with the Tasmanian community. Tasmania *Together* underpins policy development processes and government initiatives, including the Industry Development Plan and partnership agreements with Local Councils, the University of Tasmania, and other local stakeholders.

The Department of Economic Development's Innovation, Science and Technology Unit (ISTU) is the lead agency in Tasmania with responsibility for policy formulation, decision making and program delivery relating to innovation, science and technology.

The role of the ISTU is to progress public and private sector science and technology innovations, initiatives and programs in Tasmania through:

- Identifying, developing and promoting innovative business activity in key areas of the economy; and
- Strengthening existing and emerging science and technology industry sectors.

In December 2003, the ISTU undertook a comprehensive and strategic review of innovation, science and technology in Tasmania. The findings of the review were developed into a report and an action agenda and strategic plan were subsequently formed. These documents underpin the work of the ISTU.

The review identified several significant challenges for the Tasmanian innovation environment, which include:

- A strong research sector with growing demand for a strategic, coordinated approach to increase the commercialisation and technological diffusion outcomes;
- The development of strong commercialisation skills and access to early stage capital continue to be important drivers for commercialisation success;
- Collaboration and linkages are increasingly important for the sector;
- The business sector generally has a short-term inward focus at the expense of investment in research and development;
- The government has an important role to play in providing and promoting an environment where innovation can occur; and
- The recognition that there is a limited timeframe in which to capitalise on market opportunities.

## STRATEGIES AND ASSOCIATED INITIATIVES

The terms of reference for the House of Representatives Standing Committee on Science and Innovation's inquiry into science and innovation has linkages with major initiatives that the Department of Economic Development are undertaking and developing. This submission outlines these major strategies.

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# Strategy 1: Identify opportunities for economic growth within the science and technology research sector.

Tasmania has a strong science and technology research sector in areas that complement geographical, environmental and resource strengths and in which expertise has developed over time. There is a need for a strategic framework in order to ensure coordination and opportunity maximisation. Investment by Government needs to align with the State's existing and emerging research strengths and areas of priority.

Increasingly there is an expectation that research outcomes will include technology diffusion and commercialisation.

## **Current projects**

#### Tasmanian Biotechnology Audit

The ISTU hosted the Taşmanian Marine Biotechnology Forum in March 2004 to explore opportunities for collaboration and industry development. An outcome of the forum was the agreement to undertake an audit of the biotechnology sector. This work will inform the development of a framework for government's involvement in the biotechnology sector.

In particular the audit will:

- Develop a detailed snapshot of the Tasmania biotechnology sector, focussing on agriculture, aquaculture/marine, food, environment and human health including genomics, informatics, and bioprospecting;
- Assess the current state of Tasmanian biotechnology focussing on performance, capabilities, opportunities in the sector and constraints that impact on the sector; and
- Assess the importance of biotechnology to user groups and to Tasmania's future economic development.

Preliminary findings were presented at the Ausbiotech Conference in Brisbane in November 2004 and a draft report has been provided to government.

## **Emerging Biotechnology Sector**

Tasmania has a reputation for first class agriculture, aquaculture, food production, and health science industries. This, in combination with the Tasmania's world-class biopurity image and its clean, temperate environment has led to the establishment of outstanding marine-related industries and presents opportunities to expand and capitalise on other primary industries.

Tasmania's biotechnology sector is building on these resources. Tasmania's clusters of biotechnology research and development organisations are aligned to maximise its natural advantages; agriculture, aquaculture/marine, environmental services and in human or health genomics. There are also research and design developments in the bioprospecting, forestry, food production and processing industries.

## University of Tasmania

The University of Tasmania has recently begun to offer a Bachelor of Biotechnology. The course is distinctive in structure as it offers a diverse range of specialisations in key areas of the field. The course also involves close collaboration and student interaction with the biotechnology industry.

The Bachelor of Biotechnology has attracted 77 students, with a large international contingent.

#### Menzies Research Centre – Gene technology

The Menzies Research Institute conducts leading-edge research into the environmental and genetic causes of disease. It has capitalised on Tasmania's small and stable gene pool and the state's goodwill to undertake such research.

The Institute's Genetic Epidemiology Unit is capitalising on the state's advantages for genetic research to determine the underlying genetic causes of human disease. It investigates the genetic basis of several complex diseases and provides a DNA extraction and genotyping service for research programs of the institute. A significant breakthrough for the unit has been identifying a new gene linked to Nance Horan syndrome, a condition that includes congenital cataract, dental abnormalities and mental retardation.

The institute is strongly supported by the nationally based Menzies Foundation, the University of Tasmania and the Tasmanian Government, and attracts scientists with international reputations along with the best local researchers. It also collaborates with nationally and internationally in undertaking research, such as into the Nance Horan Syndrome.

## Antarctic Climate and Ecosystems Cooperative Research Centre (ACE CRC)

In 2002, the Minister for Economic Development, the Hon. Lara Giddens MHA, committed a three-year commercialisation assistance package to ensure that the Antarctic Climate and Ecosystems Cooperative Research Centre (ACE CRC) would be located Hobart, the capital of Tasmania.

As part of this commitment, the Australian Institute for Commercialisation is undertaking a two-day forum to increase the CRCs commitment to a culture of innovation.

Commercialisation Support for the Antarctic Climate and Ecosystems Cooperative Research Centre

The ACE CRC is a collaboration of Australian Agencies with an interest in the Antarctic and the Southern Ocean. Its research focuses on the interactions between ice, ocean and atmosphere and their impact on the global and regional climate systems and on Antarctic marine ecosystems. The oceans that surround Australia are home to at least five types of 'mega-biodiversity hotspots. The richest sites for oceanic biodiversity are coral and temperate reefs, volcanic vents on the ocean floor, the abyssal plains deep between undersea mountain ranges, and the recently explored seamounts, especially between Australia and New Zealand and south of Tasmania.

An important outcome of the work undertaken at ACE CRC is the production of expertly trained scientists with international experience and skills in research as well as commercial awareness. As part of a strategy to improve the economic outcomes from Tasmania's research the Tasmanian Government has partnered with the ACE CRC to employ a commercialisation manager and host a series of commercialisation bootcamps for researchers and students.

#### Research Priorities

In partnership with the Tasmanian Science and Technology Council, the Tasmanian Government is undertaking consultation to establish research priorities for the State. This project has identified the need for a state-wide, long-term framework for building Tasmania's research and development capacity, supporting key research and development initiatives and targeting research in areas where the State has a competitive advantage. It is intended that Tasmanian research priorities will align strategically with national research priorities and will position the State to more effectively develop strategic partnerships and national collaborations.

## **CRC for Sustainable Forest Landscapes**

In the 2004 CRC Program round, the Tasmanian Government has committed to provide the CRC for Sustainable Forest Landscapes (CRCSFL) with in-kind support of up to \$100,000 per annum to assist with its commercialisation strategies.

#### Smart Internet Technology CRC

The Tasmanian Government is providing assistance to the Sydney-based Smart Internet CRC through the establishment of an industry partnership program. Government will subsidise each of up to five Tasmanian small to medium enterprises that are successful in their application to partner with the CRC on this project.

#### **Development of a CRC Framework**

A framework is currently being established to inform the Department of Economic Development's decision-making on the provision of financial support to CRCs, Centres of Excellence and other research collaborations. This work will be informed by the Research Priorities project.

## Office of the Chief Scientist

The Tasmanian Science and Technology Council has identified the establishment of a Tasmanian Office of the Chief Scientist as one of four key priorities with which it wishes to engage with Government. The role of a Tasmanian Chief Scientist would be to act as a conduit between the science and technology sector and government, it will also provide

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advice to government and facilitate the implementation of Tasmania's Science and Technology Policy and the Science and Technology Industry Plan.

## Strategy 2: Identify and facilitate access to a range of skill development programs to assist with the commercialisation of ideas and research outcomes.

It is recognised that many entrepreneurial Tasmanians lack some of the necessary skills to turn their ideas into commercial reality. In order to be competitive and have the capacity to take an idea through the commercialisation process, Tasmania must expand its efforts to develop commercialisation, enterprise development and management skills.

#### **Current projects**

#### Market Ready Commercialisation Program

The Market Ready Commercialisation Program (formerly known as the Commercialisation Ready Program) was established in 2001 and is designed for Tasmanian businesses that are commercialising innovation. Participants complete an introductory commercialisation session followed by ten intensive one-day workshops over a period of four months. Workshops enable businesses to develop strategy in areas such as intellectual property, marketing, financial forecasting and investment attraction. Integral components of the program are coaching, and an opportunity to pitch the project to potential investors. Currently, 140 representatives from Tasmanian businesses have graduated from eight programs held over the past three years.

A review of the Market Ready Commercialisation Program found that the return on investment per job after two years is approximately the same level as for grants.

## Technical Edge Pty Ltd

In June 2000, Technical Edge Pty Ltd (Technical Edge) was formed to commercialise the Pivot Pegz product for motorbikes. The product is the worlds first off-road foot peg that incorporates a precisely tuned and spring loaded forward and backward pivoting action designed to move with the natural motion of the rider allowing a fast, smoother, and safer ride.

Prior to receiving assistance, Technical Edge was an embryonic start-up company with little more than a good idea. However with assistance from the Department of Economic Development, the director of the company completed the Market Ready Commercialisation Program and developed a plan to take the product to market. Since 2000, the company has attracted considerable investment and the Director has provided business mentoring.

From small beginnings, Technical Edge has sold 1400 units and in 2004-05, sold more than \$300,000 worth of the product. It has established distributors in the UK, USA, France, Australia and Belgium.

#### Tasmanian Enterprise Workshop (TEW)

In 1980, the TEW commenced operation with teams of entrepreneurs working together to assess business ideas with a view to developing a full business case. Over the past three years the TEW course material has become out-dated; with the course no longer well enough differentiated from other programs.

The program has since been revised through the Tasmanian Chamber of Commerce. TEW now focuses on providing introductory material to assist start-up, spin-off or existing businesses in high growth industries progress ideas which may demonstrate feasibility and planning competency and progress towards commercialisation.

Program objectives include:

The promotion of business generation, sustainability or growth:

The promotion and establishment of transferable skills in assessing the feasibility of a business idea or opportunity;

The identification of a number of business opportunities with commercially acceptable feasibility studies capable of progressing through as participants in the Department's Market Ready Commercialisation Program;

The delivery of a number of quality graduates with high potential to commercialise their opportunity; and

The identification of one State finalist for entry into the National Enterprise Workshop final.

### Tasmanian Technopark Incubator

The Tasmanian Technopark Incubator acts as the catalyst for the development, support and marketing of the technology industry in Tasmania. It provides assistance to start-up and existing businesses to accelerate growth, facilitate strategic alliances and encourage information dissemination and technology transfer with other organisations. A skill development program has been developed to assist the incubator companies address identified skill gaps.

Tasmanian Technopark incubator company Biocontrol Australia Pty Ltd Technopark incubator company Biocontrol Australia chief executive officer and plant pathologist Dean Metcalf leads a consortium of companies formed with the aim of producing, developing and marketing a specialist compost enriched with Trichoderma Td22. Triochaderma, which is a fungus native to soils in north-west Tasmania, has been used successfully to combat important diseases in agriculture.

Research into diseases and the compose is important for enhancing and expanding Tasmania's vegetable crop production. Research is now underway to determine whether the fungus is effective against Botritus, which has a significant impact on the Tasmanian wine industry.

#### Australian Institute for Commercialisation (AIC) education programs

The AIC has developed a series of skill developed programs to address identified barriers to commercialising the research emerging from public research institutes. The Commercialising Technology Bootcamp is an intensive professional development program aimed at helping researchers and doctoral students develop the guidelines, knowledge and tools needed to make the most of opportunities in commercialisation research. This program has been offered successfully for the Antarctic Climate and Ecosystems Cooperative Research Centre, the Australian Maritime College and will be delivered for the Tasmanian Institute for Agricultural Research and Tasmanian Aquaculture and Fisheries Institute.

#### Entrepreneurship Education

In 2000 the Tasmanian Government supported the establishment of Enterprise Learning Centres in all of the Senior Secondary Colleges in Tasmania. Support for this initiative was followed by the introduction of the Entrepreneurship Major at the University of Tasmania in 2002.

#### Partnership Creates Entrepreneurship Major

In 2001, the Tasmanian Innovations Advisory Board recommended \$200,000 in funding to establish Entrepreneurship education at the University of Tasmania. As a result the University of Tasmania launched units in the Entrepreneurship Major and creativity in 2002.

The program in entrepreneurship has been designed to develop the skills to recognise commercial opportunities and the insight, self-esteem, knowledge and skills to act on them. It includes development in opportunity recognition, commercialising a concept, marshalling resources in the face of risk and initiating a business venture.

One of the key outcomes will be a growing number of students graduating from University with increased skills of innovation and entrepreurship, impacting on the wealth-generating capacity of Tasmania.

In 2005, 215 students are undertaking the University of Tasmania's Entrepreneurship Major. Since the program commenced, six students have started innovative business enterprises in areas such as 3D animation, ICT, property and hospitality. In addition, one program participant recently sold a product trade mark to Coca Cola.

## Investment Ready Program

Innovative Tasmanian businesses often encounter problems in obtaining investment at critical points of commercialisation and business growth. Conversely, financial consultants indicate that investment funds are available and that investors have difficulties finding quality projects in which to invest.

The Tasmanian Government is currently developing an investment-matching program to:

- Increase the flow of private equity into innovative and high growth Tasmanian enterprises;
- Foster entrepreneurship, commercialisation and business development; and
- Provide an environment that encourages investment attraction, the establishment of networks and skill sharing.

Key components of the program will include:

- Promoting the program to investors, intermediaries and businesses;
- Attracting angel investors to register as part of the network;
- Attracting registration of businesses and lodgement of investment proposals;
- Screening of investors;
- Provision of information and assistance to businesses to ensure that investment opportunities are in a consistent and useful format for review by investors;
- Filtering out businesses and investment opportunities that are non viable or not investment ready and referring them to other programs where appropriate;
- Investor and intermediary networking and awareness-raising workshops;
- Mentoring of businesses; and
- Promotion of business investment success stories.

# Strategy 3: Stimulate a culture of innovation through the implementation of a range of targeted awareness raising and promotional activities.

Engaging the community in innovation, science and technology is a strong feature of the Government's activity. Raising awareness requires education and communication across all sectors of the community. Activities promote the adoption of innovation as an essential component of the State's economic prosperity.

## **Current activities**

## Science and technology business and commercialisation case studies

In collaboration with the Tasmanian Science and Technology Council the Innovation, the Tasmanian Government is implementing a project to communicate Tasmania's core science and technology strengths to the business and general community. These case studies will also be used to promote Tasmania's strengths to investors with the aim of attracting investment in the State.

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#### Australian Innovation Festival

The Australian Innovation Festival is a ten-day showcase of innovation held across the country, in partnership with industry, government, research and education sectors. The Tasmanian Government coordinates a program of events in Tasmania in conjunction with the Festival.

#### Queen Victoria Museum and Art Gallery Innovation Showcase

The Tasmanian Innovations Advisory Board recently recommended financial support for the development of a Tasmanian Innovation Showcase in conjunction with the Queen Victoria Museum and Art Gallery (QVMAG).

The QVMAG, established by Act of Parliament in 1895, is the largest Museum in Regional Australia. It holds nationally significant collections in the arts, humanities and natural sciences.

QVMAG has had a long standing interest in documenting and promoting Tasmanian innovation. In 1987, it organised and presented a major exhibition "Tasmanian Inventions and Innovations". The exhibition was accompanied by an illustrated 60 page catalogue. Since then, the Museum has maintained an active interest in Tasmanian inventions, innovations and design.

The Museum was originally located in a purpose built building in the Royal Park. In 2001, a second site was developed at the then-derelict Launceston Railway Workshops in Inveresk. Within this site, QVMAG is establishing a new exhibition showcase called the Tasmanian Innovation Showcase. The Showcase will display examples of historical and contemporary Tasmanian innovation. These interactive displays will be housed in a dedicated area at the Inveresk site. The exhibition will be complemented by a virtual exhibition on the museum's website and supporting education programs to encourage the community and students to learn about enterprise and entrepreneurship.

The benefits of this project include raising awareness in both the community and the education sector of Tasmanian innovators and innovation. The Tasmanian Innovation Showcase will promote the adoption of innovation as an essential component of the State's economic prosperity and will promote the contribution of enterprise education and encourage young people to be entrepreneurs.

## Strategy 4: Initiate and strengthen linkages and collaboration between businesses and between the business and research sectors.

Collaboration enhances the value of innovative ideas and knowledge. Partnerships between public sector research institutes and the private sector provide channels for technology transfer. In addition, partnerships between the research and industry sectors and between individual businesses help address issues associated with scale and scope. The Tasmanian Government supports initiatives designed to facilitate connections between the public and private sector and to encourage cross sectoral collaboration.

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#### **Current activities**

#### Tasmanian Innovations Advisory Board (TIAB)

In May 1999, the TIAB was established to create a culture of innovation by advising the State Government on innovation policy and its implementation and administering of the Tasmanian Innovations Program.

Since formation the Board has recommended \$3.9 million in funding to 49 businesses commercialising innovation in Tasmania. In addition the Board has supported the establishment of an Innovation Showcase at the QVMAG; establishment of the Enterprise Learning Centre Program in senior secondary colleges; and the introduction of the University of Tasmania's Major in Entrepreneurship.

#### Tasmanian Science and Technology Council

Industry Councils play an important advisory role to Government and provide insight into opportunities and challenges affecting the growth of the State's strategic industries. The Tasmanian Science and Technology Council held its inaugural meeting in April 2002, becoming the eighth Industry Council established as a result of industry audits undertaken by the Tasmanian Government.

Since formation, the Tasmanian Science and Technology Council has developed an Industry Plan which provides clear direction for the Tasmanian science and technology industry in the medium to long-term. The Council has also implemented a range of activities in conjunction with research institutes industry bodies and the education sector.

#### *i-cubed* Network

The *i*-cubed Network is for innovators, investors and intermediaries. Network events bring together these three groups with the aim of developing opportunities for Tasmanian innovators and entrepreneurs in investment attraction, strategic alliances and consortia formation. To date, over 1500 people have attended *i*-cubed functions statewide.

#### National Science Week

National Science Week is an annual festival of science, technology and innovation which aims to raise the profile and awareness of the importance of science, technology and innovation. The week celebrates Australia's innovative achievements, its unique landscape and its future. The Tasmanian Government coordinates a number of National Science Week events in Tasmania in partnership with the Tasmanian Science and Technology Council. In 2004, these events included a seminar on "making science pay", a dinner at Parliament House "Science meets Parliament", and the Young Tassie Scientists Program where University researchers speak with students at schools about pursuing careers in science.

## Business Over Breakfast Research Industry Network

In collaboration with the University of Tasmania and the Industry Councils a topical breakfast seminar program has been instigated with research and business leaders. The first seminar on the hydrogen economy and opportunities for industry to collaborate with the School of Engineering was held in November 2004 and a hydrodynamics breakfast is planned in conjunction with the Australian Maritime College.

### Business Over Breakfast leads to Student Engineering Innovation

The Business Over Breakfast network brings together researchers and business people to create linkages with the aim of quick information diffusion, product development and competence building. The first seminar on the hydrogen economy and opportunities for industry collaboration with the School of Engineering was held in November 2004

One of the programs first successful outcomes arose as a result of a University academic sitting next to the manager of a local Tasmanian business and discussing barriers to commercialisation. The project involves the establishment of a Student Engineering Innovation Pilot Project. Students from the University of Tasmania majoring in entrepreneurship and engineering students are teaming up to assist small Tasmanian enterprises to undertake research, development and commercialisation activities.

According to Novaris Pty Ltd business managers Phil and Di Thompson the project will address the often forgotten gap between research and development and commercialisation as well as provide a useful learning experience for students. The program will help to build relationships between companies, University researchers and entrepreneurship graduates.

## Strategy 5: Facilitate and provide access to capital/finance for business innovation and growth

Accessing capital at appropriate stages in the commercialisation process is an important challenge for Tasmanian businesses, particularly small to medium enterprises with limited experience in raising capital. Funding is a vital component to assist and foster innovation, especially for projects and organisations seeking rapid commercialisation and growth.

## **Current Projects**

## Tasmanian Innovations Program (TIP)

In May 1999, the TIP was established with the State Government's commitment of \$1 million per annum. The program intends to foster a culture of innovation in Tasmanian industry, in recognition of the key role innovation plays in driving economic growth. Since 1999, commitments totalling \$2.8 million have been provided to 43 businesses commercialising innovation in Tasmania. The Program has also supported the introduction of Enterprise Learning Programs in Senior Secondary Colleges, the University of Tasmania's Major in Entrepreneurship and the Tasmanian Innovations Showcase at the QVMAG.

For the period July 2002 to December 2004, TIAB has recommended a total of \$2.224 million in funding to 17 Tasmanian companies. A total of \$1.107 million has currently been disbursed.

As a direct result of TIP funding, surveyed companies reported an increase of \$4.655 million in the value of their sales. Of this, 76% of sales were to overseas markets, 8% were to interstate markets and 16% to local markets. Also, 31.5 new full time jobs were created, \$2.980 million of additional investment was raised, 11 partnerships were established and \$1.174 million was expended on additional research and development.

### S.D Reid Pty Ltd Selling Japanese Cherries to Japan

The Reid Family has been involved in the Tasmanian apple industry since 1856 operating orchard properties and a packing shed in the Huon Valley in southern Tasmania. Tim and Debra Reid are the fifth generation to manage the business, making it one of the longest continuing apple growing enterprises in Australia.

SD Reid Holdings Pty Ltd (SD Reid) owns 60 hectares of orchards in southern Tasmania and exports apples to 10 countries. Approximately 2,000 tonnes of apples are produced annually and the company employs 29 full time staff.

S. D. Reid Holdings Pty Ltd (SD Reid) was funded \$150,000 in October 2005 through the Department of Economic Development's Tasmanian Innovation Program to complete the commercial establishment of Japanese Cherries in Tasmania. Japanese Cherries are currently not grown commercially outside of Japan. Cuttings have been imported from Japan, and significant research and development has been undertaken into the production of these cherries. To date 14,000 trees have been produced and planted over 13 hectares of land and a further 25,000 trees are planned to be planted in the next two years. The cherries will be produced for the Japanese market to be provided during the peak Christmas New Year period.

From the very first cutting being selected by hand when Tim visited Japan's major cherry production region Yamagata Prefecture, to the erection of complex netting, irrigation and fertilization systems, the Reid operation has focused on innovation.

The Japanese varieties are grown extremely intensively on the twenty-first century trellis system known as the Open Tutura. This innovative system promises commercial fruit crops far earlier than what can be achieved with traditional orchard practices.

In addition, the fully automated rain-cover system protects ripening fruit from damaging summer rains. Other features of the project include an innovative hydro cooling and cold chain management system which prevents the fruit being damaged by frost.

#### Science and Technology Industry Development Grants Program

In December 2004, the Science and Technology Industry Development Grants Program was launched. The program aims to initiate and strengthen linkages between businesses in the science and technology sector and provide broad benefit to industry through technology diffusion activities.

Small grants of less than \$10,000 are provided for cluster development activities, industry initiated networking activities, scientist in residence and travel scholarships, industry led postgraduate research programs, and research and business sector collaboration activities.

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A collaborative partnership between with the Royal Hobart Hospital, the University of Tasmania School of Medicine, and Marinova Pty Ltd was the first recipient of a Science and Technology Industry Development Program grant. Marinova is a Tasmanian company proving that marine biotechnology ventures, and focuses on extracting bioactive compounds from the seaweed *Undaria pinnatifida* that it harvests from Tasmania's pristine waters. This seaweed is used in pharmaceuticals and a variety of 'over the counter' products, including nutraceuticals and botanical drugs.

The company is developing a pharmaceutical grade extraction facility at Triabunna on Tasmania's east coast in close proximity to where the introduced *Undaria* is harvested and processed.

The company has patented and is marketing a unique sulphated polysaccharide, known as Galacto Fucan Sulphate (GFS), and is working on further carbohydrate polymers for use in pharmaceutical grade products.

Marinova isolates and characterises other bioactive constituents of *Undaria* and additional varieties of marine algae. The seaweed possesses potent anti-viral components that could fight against several viruses, including drug resistant strains of HSVI and HSVII, cytomegalovirus, influenza and HIV.

For further information on any of these initiatives, please contact:

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