

# Created **at** Guelph



UNIVERSITY  
of GUELPH

**RESEARCH  
INNOVATION**

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## 2018–19 Annual Report



**John Livernois**

Executive Director,  
Research Innovation &  
Knowledge Mobilization  
(Interim)



**Dana McCauley**

Director, New Venture  
Creation (left)

**Steve De Brabandere,**

Director, Technology  
Transfer and Industry  
Liaison

## Letter from the Interim Executive Director

I am excited to share highlights of how the Research Innovation Office (RIO) helped the University of Guelph's researchers increase the impact of their work from May 2018 to April 2019. During that period, our team of specialists, led by Directors Dana McCauley and Steve De Brabandere, worked with faculty from across campus to enable research outcomes that improve life. Our team helped to patent and license intellectual property; provided support and education to enable researchers to start new companies based on their work; and assisted researchers in building strong industry and community relationships.

Some highlights include:

- Several U of G start-up companies are making an impact on the market, with MicroSintesis setting a new standard by raising more than \$16 million to deliver products for livestock, companion animal and human health.
- Unique within Canada, our new Policy Fellowship program brings policy-makers from across the

country to campus for three days of intense discussion and information exchange that informs both policy and research.

- RIO had a strong year of commercialization outcomes, completing 27 new license agreements. Likewise, inventions created at the University in the past continue to have an out-sized impact on the economy, as illustrated by this year's Innovation of the Year winner Dave Wolyn and his team's asparagus varieties.
- Within these pages you'll also meet many of our amazing faculty who continue to attract partners seeking to solve important industry problems. Supported by our Industry Liaison team, these relationships produced successful projects across all seven colleges.

I look forward to another great year of collaboration and commercialization and invite you to follow our journey by signing up for our #CreatedAtGuelph newsletter ([uoguel.ph/rionewsletter](http://uoguel.ph/rionewsletter)). Let us know how we can help you to accomplish your innovation goals!



**Create**



**Collaborate**



**Commercialize**

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**Cover:** OAC17-SRW-04 wheat, registered  
by the late Professor Ali Navabi in 2018.  
Photo: Malcolm Campbell



# Start-up Highlights



## Escarpment Laboratories

The most important ingredient in beer is yeast. Working with Dr. George van der Merwe (Molecular and Cellular Biology), former graduate students Richard Priess and Angus Ross started Escarpment Labs to provide unique yeast cultures to both local and global brewers. Founded in 2014, the company has grown to 13 employees in Guelph and maintains a strong research relationship with Dr. van der Merwe.

**Angus Ross poses with a bottle of yeast made by his company, Escarpment Labs.**

Photo: Kenneth Armstrong/GuelphToday.com



## NeoPhyto Foods

Plant-based foods that mimic the function and taste of traditional animal-based products—such as meat and cheese—are a growing area of interest for consumers. Working with Dr. Art Hill (Food Science), graduate student Kamil Chatila-Amos and recent U of G grad Jane Ong have used new techniques to create a smooth, spreadable soy version of traditional cream cheese that is winning over bagel lovers.



## MicroSintesis

Using novel molecules found in probiotics studied in the lab of Dr. Mansel Griffiths (Food Science), MicroSintesis created products that inhibit the growth of enteric pathogenic bacteria. Antibiotics are often ineffective or not allowed for use in food animals, so this breakthrough promises significant economic impact and has allowed MicroSintesis to raise \$16.4 million to scale the production of products for livestock, companion animal and human health.

**MicroSintesis' product Nuvio supports the growth and health of post-weaning pigs.**

# Accelerator Guelph

## Cohort One Results (Phase 1)



6

Teams



2

Incorporated  
companies



44

Hours of  
mentorship

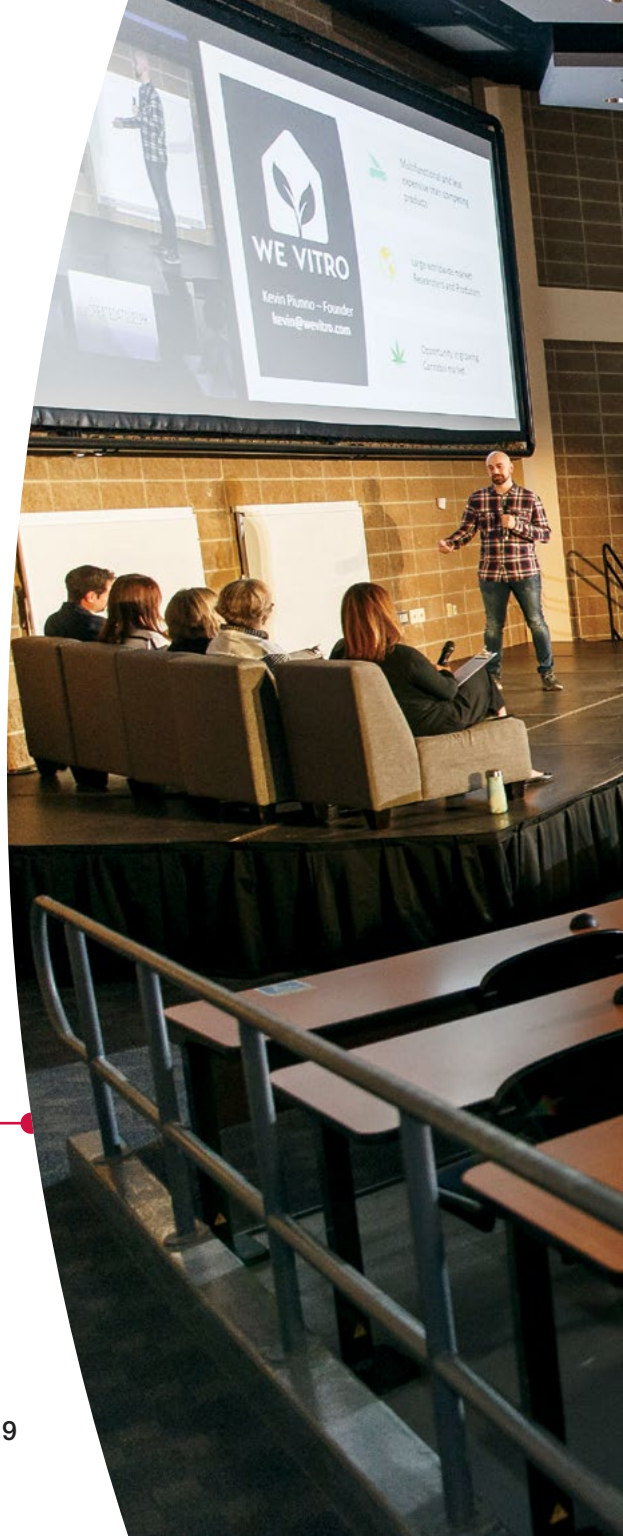
Accelerator Guelph continues to incubate researcher-led teams to commercialize their ideas through hands-on workshops and mentorship activities.

Six new teams, working on business ideas ranging from a soy-based vegan cheese to AI-powered cyber security, participated in 15 working sessions designed to hone sustainable business concepts and develop transferable entrepreneurship skills. Of the six, two teams have incorporated and entered the Business Growth stage of programming.

**Kevin Piunno, of WeVitro pitching his company in spring 2019.**

Photo: Kyle Rodriguez/Artifacts for Life

accelerator  GUELPH









# Start-up Successes



## Gryphon's LAAIR Innovation Showcase and Pitch Competition

Six research-focused start-up businesses competed for \$16,500 in prizes in spring 2019. LifeScanner, a company that authenticates species using unique DNA barcodes, was the evening's top team, winning the \$7,500 jury prize. Fan favourite We Vitro, a company that invents new products for the plant tissue culture industry, won the \$5,000 people's choice award. Earlier in the day, six researchers showcased their innovative agri-food project results to a crowd of industry, government and academics. The events were funded by the Ontario Agri-Food Innovation Alliance.

**Grand Prize winner Sujeevan Ratnasingham of LifeScanner (left) and People's Choice Award winner Kevin Piuonno of We Vitro (right).**

Photos: Kyle Rodriguez/Artifacts for Life



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Gryphon's LAAIR  
Pitch Competition

Date May 21<sup>st</sup>, 2019

Pay to the  
Order of

Life Scanner

\$7,500

Seven Thousand Five Hundred

/100 Dollars

Memo

Grand Prize Award

Per

[Signature]



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Ontario

This cheque is for presentation purposes only

# Innovation

## Budding Insight



As Canada's cannabis industry matures, U of G researchers are increasingly called upon to apply their expertise in a wide range of applications with high priority for health and agriculture.

- Drs. Steven Rothstein, Tariq Akhtar and Jose Casaretto (Molecular and Cellular Biology) developed a method for biosynthesis of cannflavin, a compound with pain-relieving properties up to 30 times stronger than aspirin. The patent application was licensed to Toronto company Anahit International, who is working to development new treatments for patients.
- Dr. Linda Parker (Psychology) uses animal models to study how compounds derived from Cannabis can be used to treat human health conditions, including opioid addiction and treatment. Working with global collaborators, her work has led to the licensing of two patent families to companies in Canada and Israel.

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### 2018–19 Technology Transfer Summary



**\$2.22 m**

License income



**206**

Reported  
inventions



**27**

New licenses/  
options



**A WeVitro tissue culture vessel system,  
developed in Max Jones' lab.**

Photo: Kevin Plunno/WeVitro

- Dr. Max Jones (Plant Agriculture) develops methods and tools to improve tissue culture of many plant species, including cannabis. Developments in his lab have led to a license with start-up company WeVitro, which is commercializing new tools that optimize how plant tissue cultures are grown.

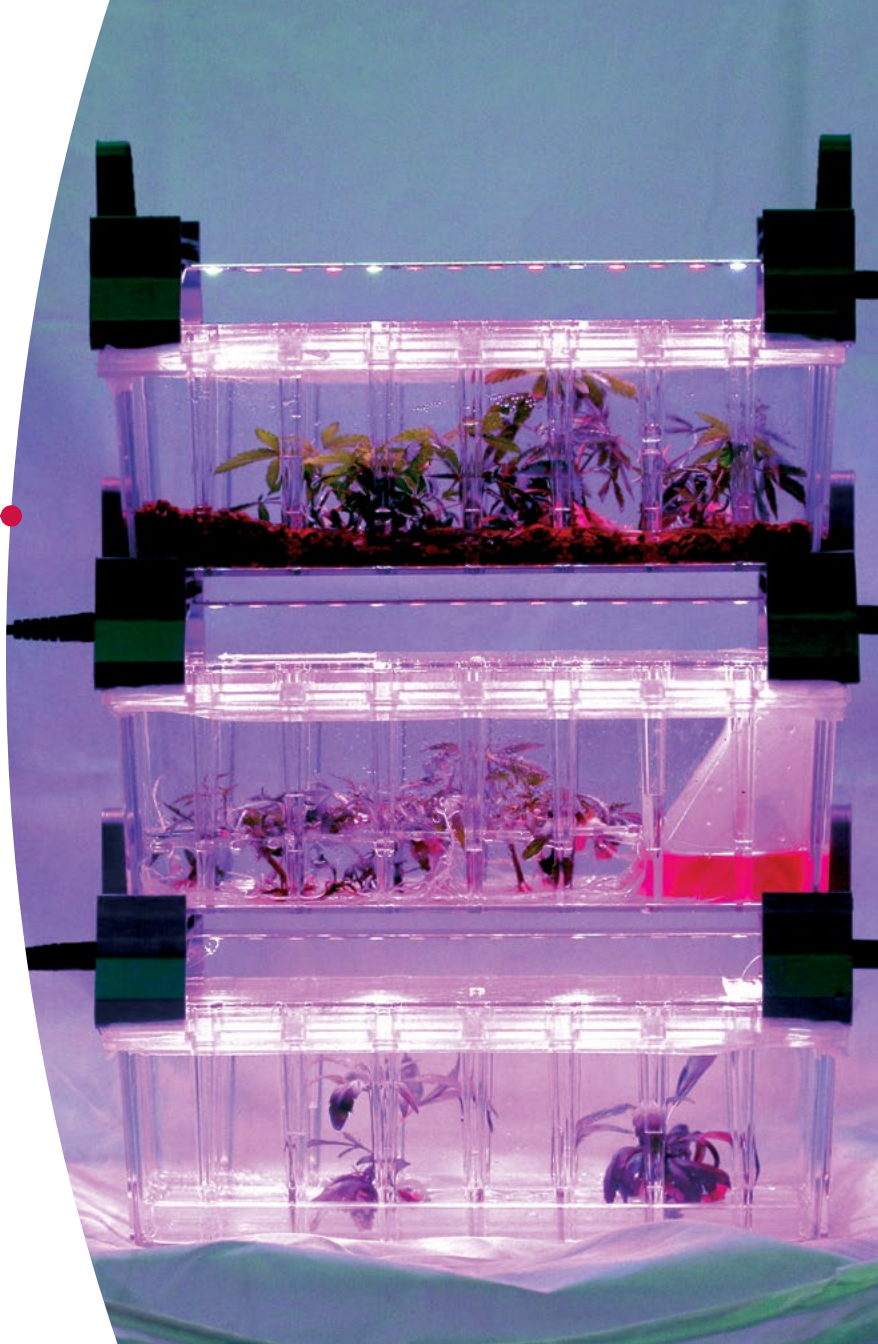


**16**

New issued  
patents

**184**

Total issued or  
pending patents



# Innovation of the Year

## Stalk Options

### What is innovation?

**The Research Innovation Office has a strict definition of Innovation. For the purposes of our work, we define innovation as the transformation or development of an invention into a patent or product that can have commercial or societal impact.**

The annual Innovation of the Year award recognizes and celebrates U of G innovations that have added value to the economy.

Professor David Wolyn and his team (Plant Agriculture) received the 2019 Innovation of the Year award for the development of hardy asparagus varieties that have transformed the North American asparagus industry.

Since the 1980s, the U of G's asparagus breeding program has produced and released the Guelph Eclipse, Guelph Equinox and Guelph Millennium varieties.



Millennium is now the predominant breed of asparagus grown in North America. While this variety offers the fresh, springtime taste that asparagus consumers love, farmers value that Millennium is very productive, produces strong, well-formed tips and has longevity, with many plants growing productively for up to 18 years.

### Past Innovation of the Year award recipients



Griffiths et al. (Food Science),  
probiotic extracts to treat  
and prevent infection



Dutcher et al. (Physics),  
phytospherix phytoglycogen  
nanoparticles



Mallard et al. (Pathobiology),  
High Immune Response  
technology for dairy





2016

Mohanty et al. (Engineering, Plant Agriculture), compostible resins for food packaging

2016

Monteiro et al. (Chemistry), carbohydrate vaccine for *C. difficile*

**Prof. Dave Wolyn with plant technician Richard Grzesik (left), retired technician Paul Banks (far right) and Malcolm Campbell, vice-president (research).**

Photo: Rob O'Flanagan

# Recognition NSERC Synergy Award

University of Guelph professors Amar Mohanty (Plant Agriculture) and Manjusri Misra (Engineering) received the Synergy Award for Innovation from the Natural Sciences and Engineering Research Council of Canada (NSERC). The award, presented at the Governor General of Canada's residence in Ottawa, recognizes dynamic partnerships between universities and Canadian industry. The prize includes a \$200,000 research grant for

Mohanty and Misra as well as funding for their industrial partners, Competitive Green Technologies and Prism Farms Ltd., for a new NSERC grant which may bring more innovative consumer and industrial products to the market. The partnership has led to several patents and products such as compostable resins suitable for making food packaging and light-weight bio-based materials used to make automotive parts.

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**Left to right: Steve De Brabandere, Prof. Malcolm Campbell, Mike Tiessen, Right Honourable Julie Payette, Lloyd Longfield M.P., Barbara Longfield, Prof. Manjusri Misra, Prof. Amar Mohanty and Prof. Mary Wells.**

Photo: Government of Canada







# Industry Liaison

## Building Connections

### IL Metrics



**31**

Projects  
awarded/closed



**\$7.16 M**

Value of awarded  
projects



**98**

Clients helped,  
including 42 new

Our Industry Liaison (IL) team helps companies access the University's research capacity and develop collaborative relationships with our faculty.

To make it even easier for industry to understand how the U of G can help them to innovate, our IL team created a *Guide to Research Partnerships with University of Guelph*. Modeled on a document released by the Business/Higher Education Roundtable and

the U15 Group of Canadian Research Universities, this easy-to-download document describes steps for developing research relationships, sample contract terms and examples of projects. Find the guide at [uoguelph/researchpartnershipsguide](http://uoguelph/researchpartnershipsguide).



Photo: Praveen Saxena

### Biodiversity and bonbons

For 20 years, Dr. Praveen Saxena (Plant Agriculture) and his team at The Gosling Research Institute for Plant Preservation have worked to increase biodiversity. Supported by our IL team and partnership with the Ontario Hazelnut Association and Ferrero Rocher, additional funding from Ontario Genomics RP3 and NSERC CRD programs was obtained to develop methods to enhance the development of hazelnut trees, mitigate drought stress and establish production techniques to multiply hazelnut plants for commercial use.





## Running with the dogs

Regular exercise is essential for a dog's physiological and psychological welfare. However, the extreme exertion experienced by racing sled dogs can lead to injuries, gastrointestinal upset and reduced welfare.

The IL team helped Dr. Anna-Kate Shoveller (Animal Biosciences) and Champion Petfoods secure funding from Mitacs' Accelerate program to optimize sporting dog nutritional products while using domestically available fibre sources. This research is sure to benefit the global sporting dog population, as Champion Petfoods is one of Canada's largest pet food manufacturers and exporters.

**MSc. candidates  
Emma Thornton and  
Eve Robinson with the  
sled dogs from Rajenn  
Siberian Huskies  
kennel in Ayr, Ontario.**

Photos: Emma Thornton  
and Eve Robinson

# Knowledge Mobilization

## Two cohorts

(October 2018,  
February 2019)



9

Fellows



52

Total meetings  
with researchers  
over 5 days

Senior-level policy-makers visited campus in October 2018 and February 2019 to participate in the University of Guelph Policy Fellowship program.

The program is the first of its kind in Canada. It consists of three days of intensive meetings designed to connect Fellows to cutting-edge research that can inform important policy decisions, build relationships between faculty and policy-makers, and stimulate discussion about complex issues in the agri-food and biodiversity sectors.

The Fellowship Program is offered twice per year and is open to policy makers working in agri-food. It is funded by the Food from Thought program, a recipient of a Canada First Research Excellence Fund grant.



I thoroughly enjoyed every minute of my time in the University of Guelph Policy Fellowship program. Meeting with faculty to ask for their insights on my policy questions was a valuable and unique opportunity that I would highly encourage others to pursue. It was particularly interesting to meet faculty from outside my normal circles and share insights and questions with the other Policy Fellows in my cohort.”

—Crystal MacKay, President,  
Canadian Centre for Food  
Integrity





The February 2019 Policy Fellowship Cohort pictured outside Creelman Hall. Left to right: David Hagarty, Director, Secretariat for the Ontario Farm Products Marketing Commission; Crystal MacKay, President, Canadian Centre for Food Integrity; Danielle Collins, Policy Analyst (Agriculture Economic Development), Ontario Federation of Agriculture; Don Buckingham, President and CEO at Canadian Agri-Food Policy Institute.

# Innovation Grants

## Gryphon's LAAIR

### Gryphon's LAAIR



**3**

Product development grants

**6**

Market validation grants

**\$334,000**  
Awarded

### Gap funding improves research impact

Transforming an invention into a market ready concept is a complex endeavour; research innovation grants support researchers along the pathway to commercialization from early market research through product development, prototyping and business incubation.

Made possible by the Ontario Agri-Food Innovation Alliance, Gryphon's LAAIR Grants are ideal for researchers who have business concepts but need to identify target markets and test concepts with end users.



Pictured here, an airlift pump designed for the aquaculture industry by Dr. Wael Ahmed (Engineering) with support from Gryphon's LAAIR.





## Easy riders

Dr. Michele Oliver (Engineering) aims to prevent workplace injuries. Her studies of whole-body vibration mitigation strategies were supported by a Gryphon's LAAIR grant, leading to the development of devices such as farm tractor seats that cushion the operator's body during use of heavy machinery.

# Innovation Grants

## Barrett Grants

### Barrett Grants



8

Projects awarded,  
\$50,000 each

**\$400,000**  
Awarded



### Sustainable aquaculture systems

Inland tank-based aquaculture for fish and shrimp enable local, safe food production, but still produce nitrogen and phosphate wastes that are expensive to manage. Andreas Heyland (Integrative Biology) and Wael Ahmed (Engineering) were awarded a Barrett Grant to develop an algae-based system to efficiently convert this waste into biomass to make aquaculture systems more environmentally and financially sustainable.





## Barrett sustainable food engineering grants

Barrett Grants are supported by a generous donation from the Barrett Family Foundation and encourage the development of ideas for creating world-class food technologies that will build a more sustainable and competitive food industry.

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