



Impact of Science

14-15 June 2018, Ottawa

Palladian Room, 13.45-15.00

Entrepreneurial knowledge transfer

Cynthia Goh (Chair)

Charlotta Nordenberg

Tamika Heiden

Entrepreneurial knowledge transfer

Cynthia Goh

*Founder and Director of the Impact Centre, & Academic
Director Entrepreneurship University of Toronto, Canada*

Panel: Entrepreneurial Knowledge Transfer

Cynthia Goh, Ph.D.

Professor, Departments of Chemistry, Materials Science & Engineering,
Institute of Medical Science, Munk School of Global Affairs

Director, Impact Centre

Academic Director, Univ of Toronto Entrepreneurship



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Entrepreneurial knowledge transfer

- Discussion point: How to best utilise academic knowledge into practical applications for society through entrepreneurship...
- 3 perspectives:
 - as Academic Director of UofT Entrepreneurship
 - as faculty: researcher-inventor-entrepreneur
 - as Director of the Impact Centre



UNIVERSITY OF
TORONTO

90,000 students in 3 campuses, 9 teaching hospitals



Start@UTIAS



INNOVATIONS &
PARTNERSHIPS
OFFICE



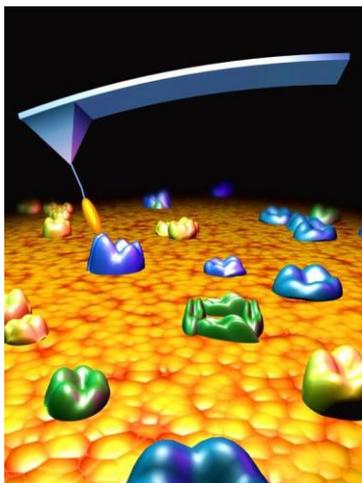
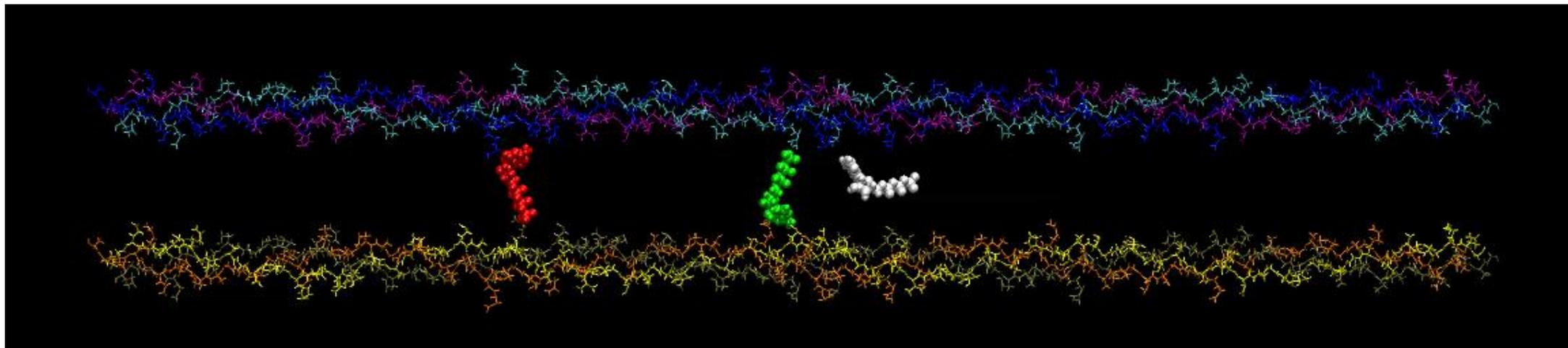
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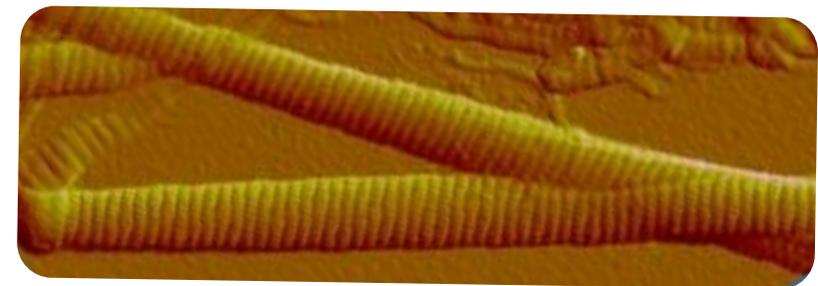
O/Ramp

+ many student organizations

My research interest: interactions of large molecules, to form complex, functional structures

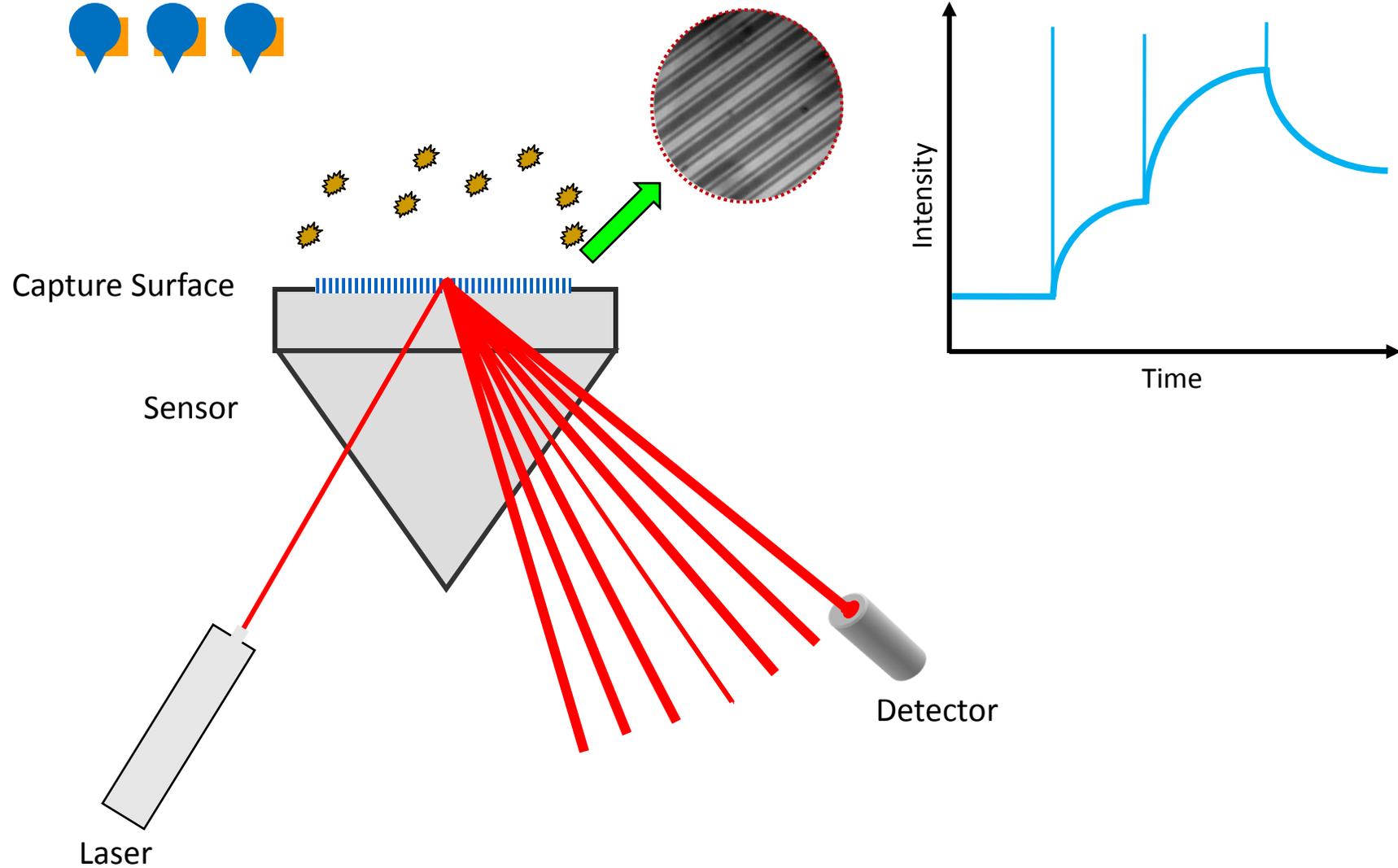


Surface chemistry
Optics and spectroscopy
Probe microscopy

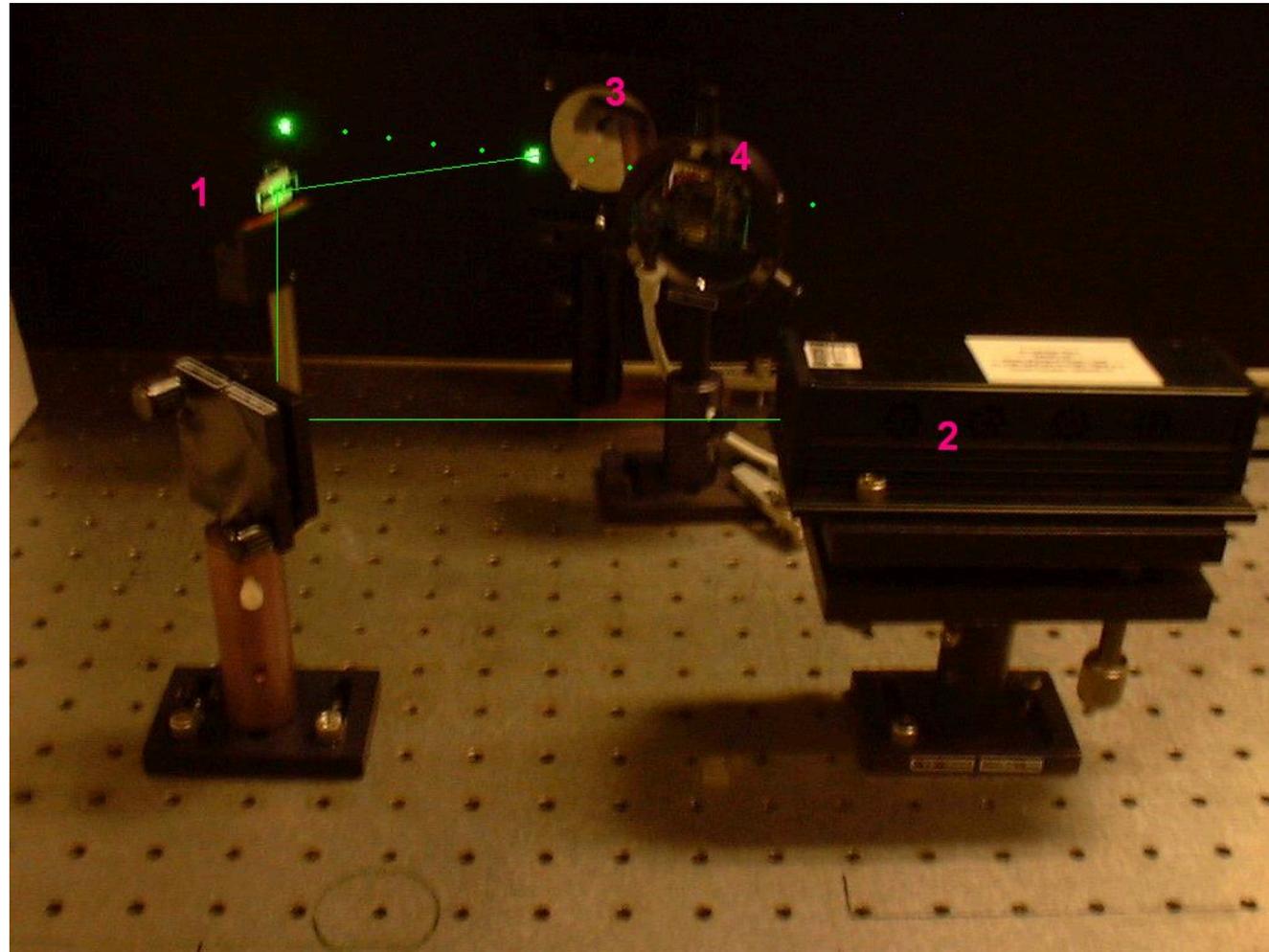


To measure molecular interactions we created a technique based on diffractive optics

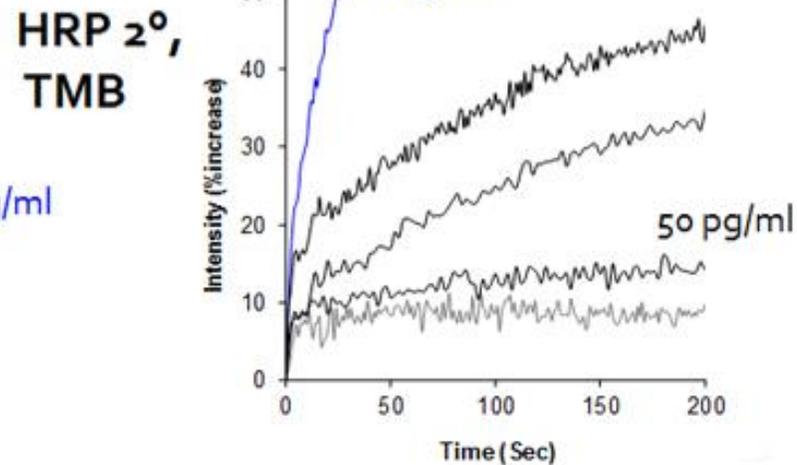
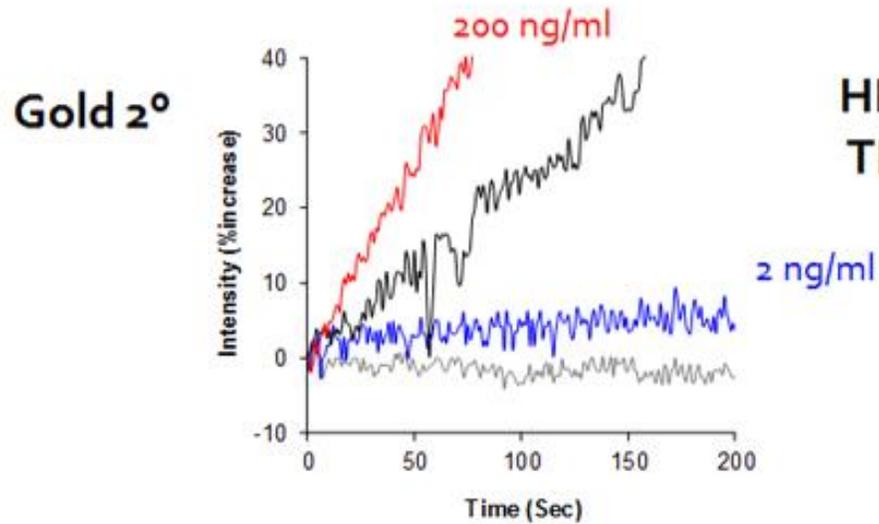
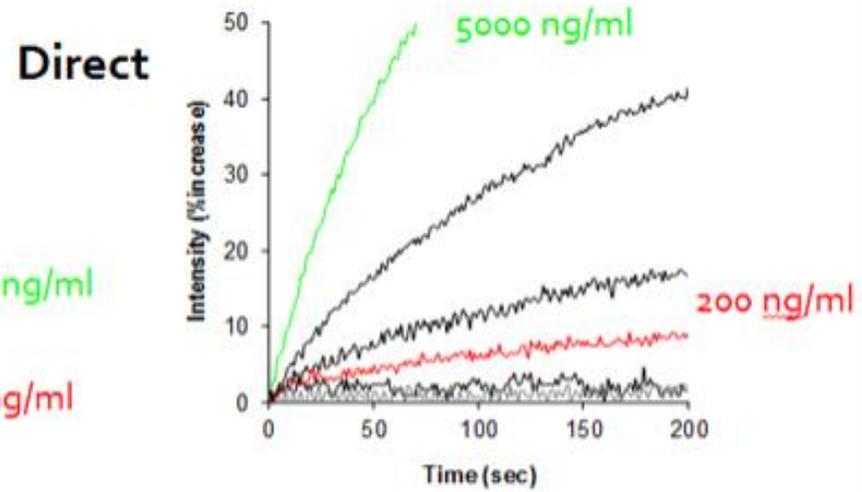
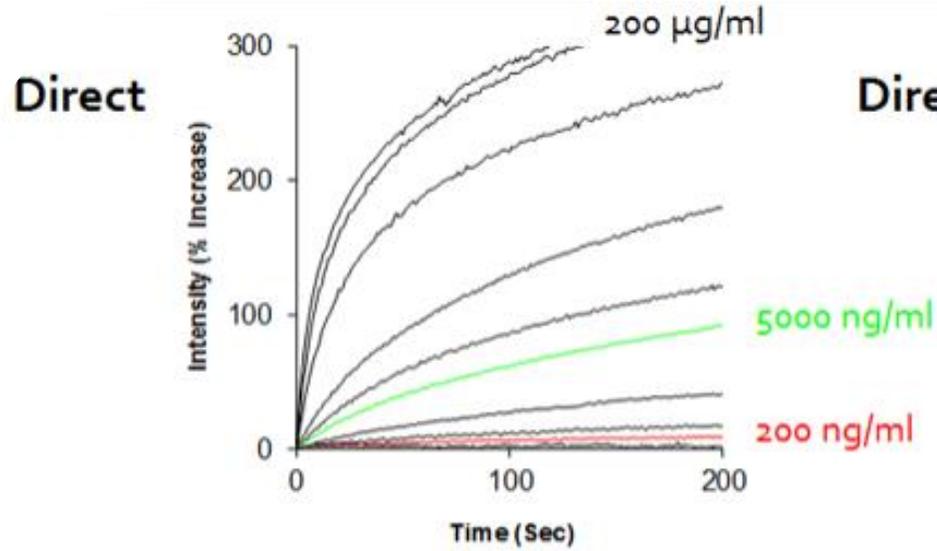
Sensing by Diffractive Optics



The instrument



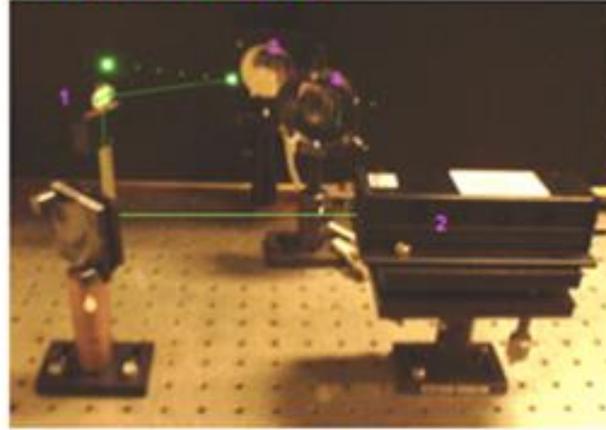
Assay for anti-digoxin (note dynamic range and sensitivity)



March 1999



March 2000



January 2004



August 2004

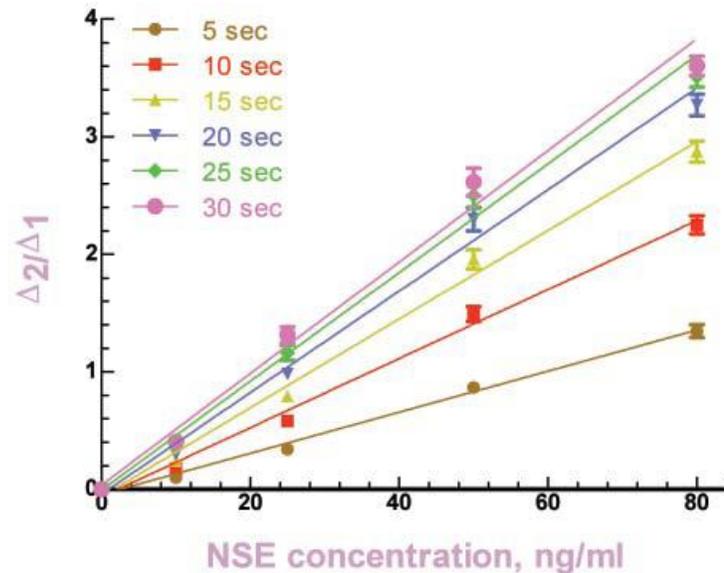
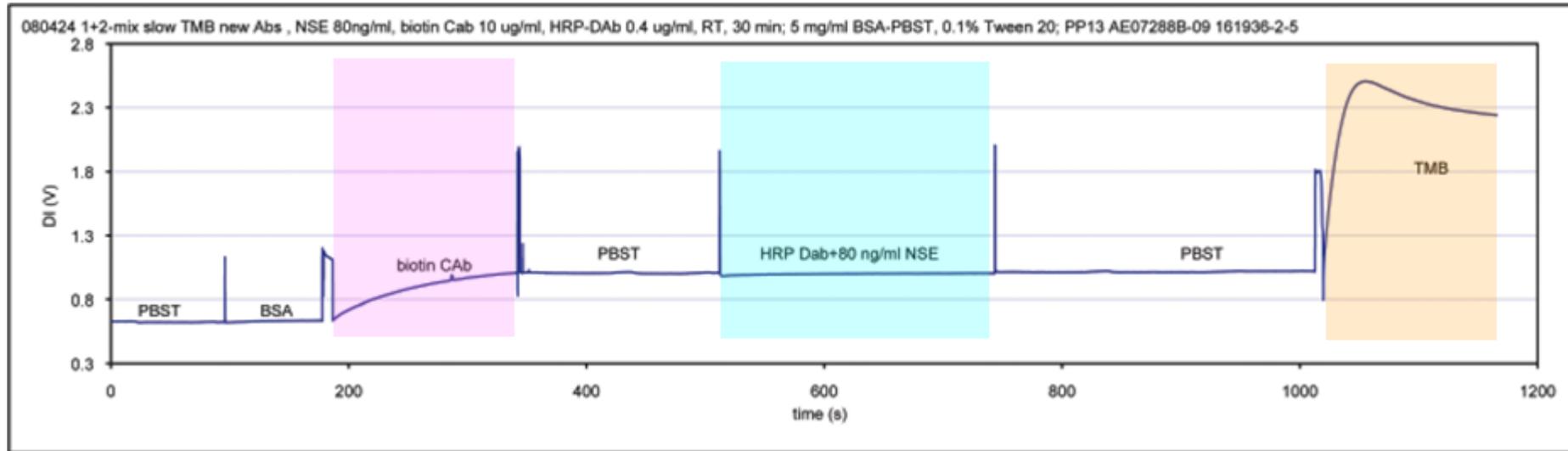


Nov 2006



Quantitative Immunoassay (Marker of Brain Injury)

Detection of Neuron Specific Enolase in 20 μ L of serum; TMB amplification



Operated in a point of use setting with avg. CV's of 10%

Significant reduction in time to result and volume requirements

Rachel Berger, University of Pittsburgh Medical Centre

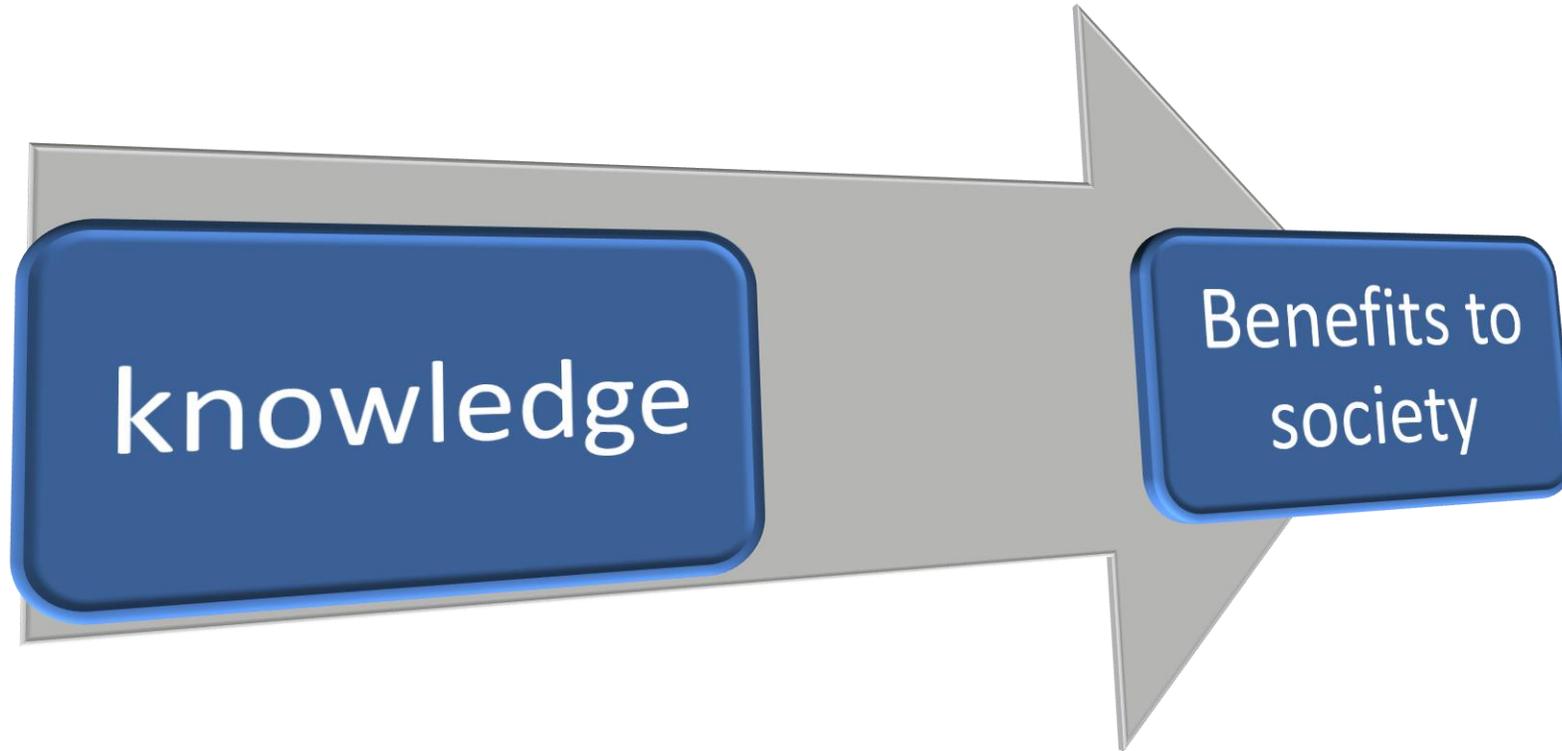
axela^x

- Diagnostics for cancer, infectious diseases
- Research instrument



Now: 
ANGLE

INNOVATION



how?

The path from science to society



*Knowledge is what research creates.
But knowledge is not technology.
Technology is not product.
Product is what reaches society ...*

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www.impactcentre.ca

Training the scientist-entrepreneur

Training the scientist-entrepreneur



In 2004-05, we created
“An introduction to scientific
entrepreneurship”

now

[Entrepreneurship101@MaRS](#),
with ~20000 registered in 2013,
resulting in many dozens of
start-ups.

www.marsdd.com

Our Elite Training Program

techno

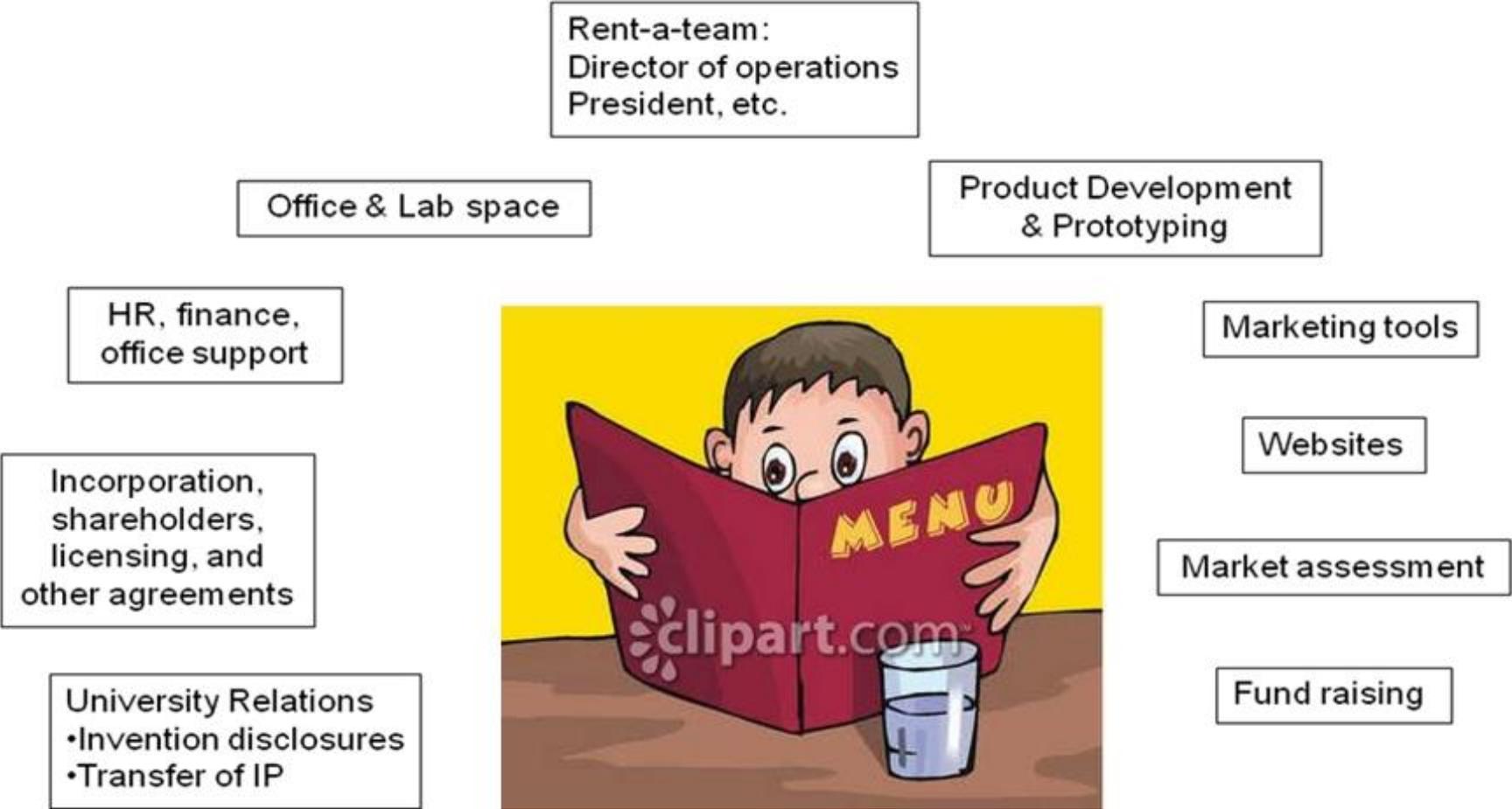
Intensive summer workshop to create a company

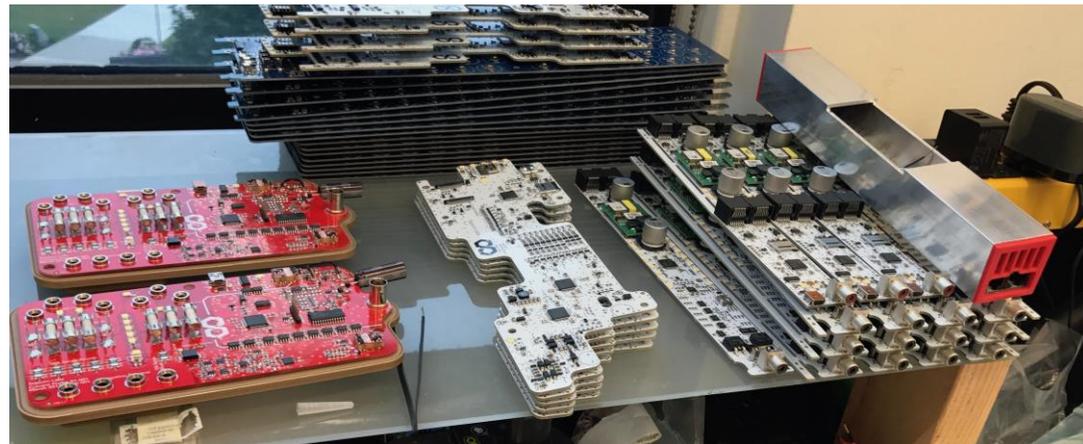
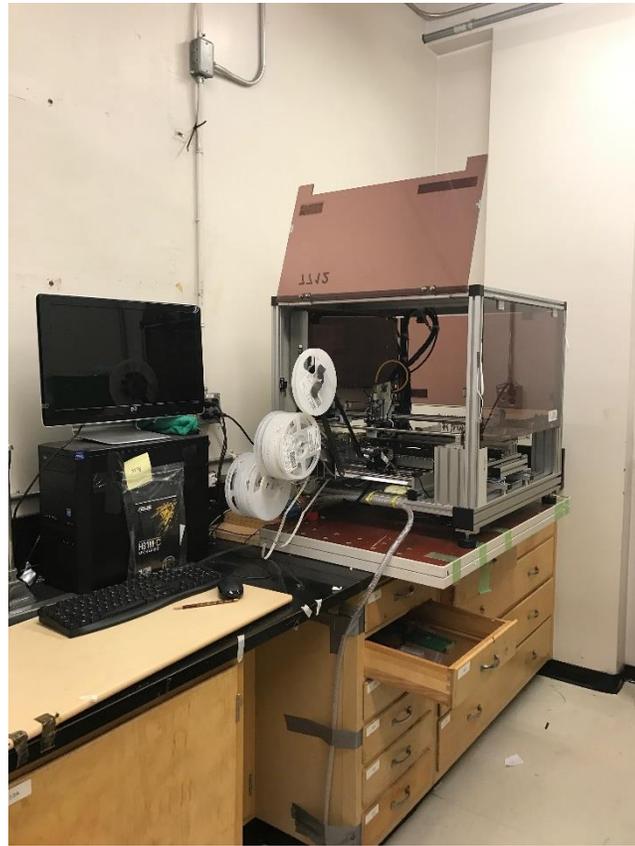
Input: MSc/PhD/PE/TD science & engineering

Output: science-based company

142 startups since 2010
<https://www.impactcentre.ca/entrepreneurs/techno/>

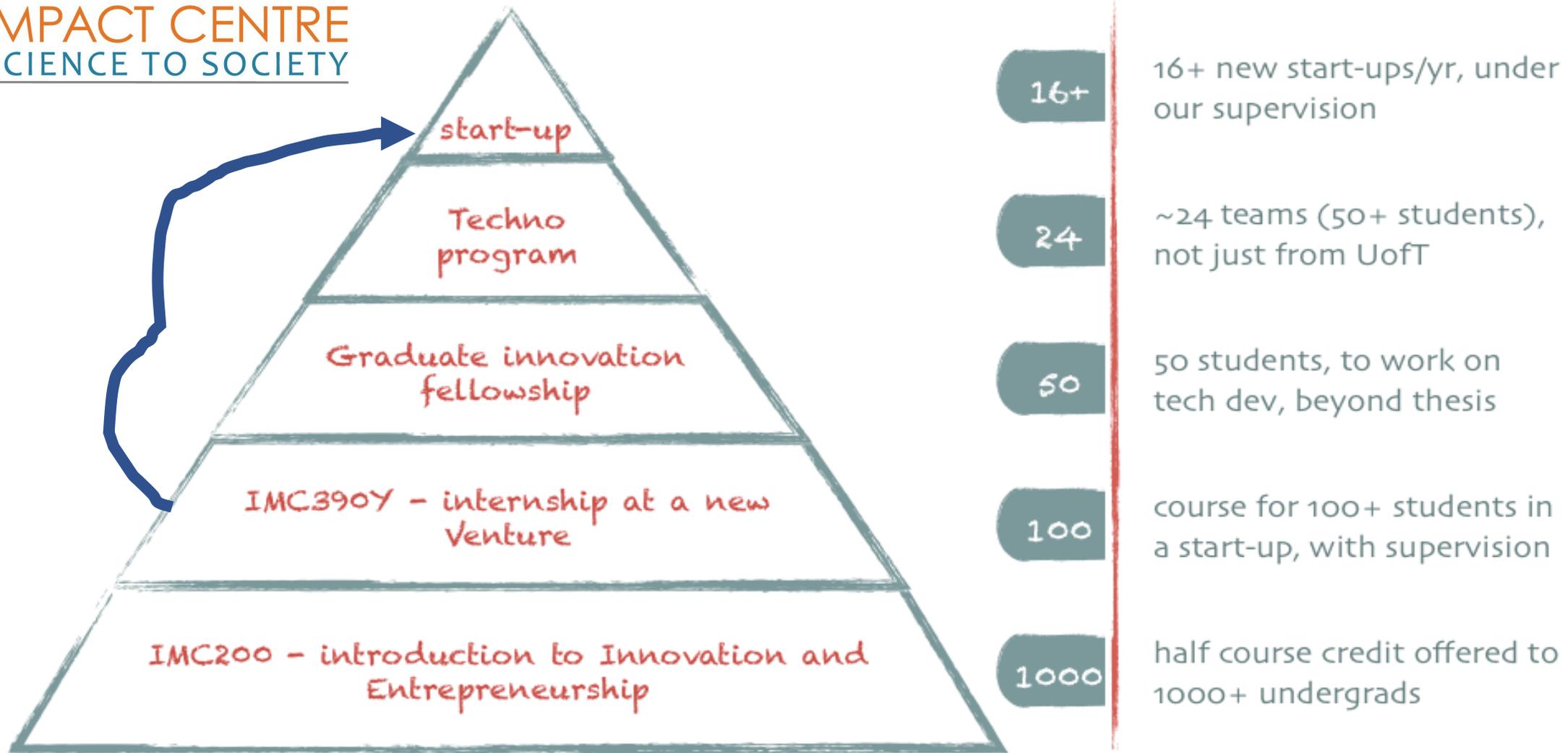
Assistance that's needed, when needed





building a student ecosystem

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Artificial Intelligence for Drug Discovery

We design new molecules for the hardest targets. Our discoveries help our partners deliver **better medicines faster**.

[OUR TECHNOLOGY](#)
[CAREERS](#)

SOME OF OUR PARTNERS



AZteroid FC fungicide on American Crystal Sugar's 2018 Gold Standards list

Posted on *January 30, 2018*

FOR IMMEDIATE RELEASE

January 30, 2018 [Toronto, ON] – AZteroid FC fungicide, the only fertilizer-compatible fungicide for sugarbeets is included on American Crystal Sugar Company's 2018 Ag Gold Standards list for 2018.

AZteroid FC is unique among sugarbeet fungicides because it can be mixed in the same tank with starter fertilizer and applied at plant to control rhizoctonia, and to maximize yield and sugar content.



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Innovative Damping Technology Behind the Scenes at YC Condos

April 23, 2018 10:45 am | by Marcus Mitanis | [4 Comments](#)

As Toronto's condominiums reach impressive new heights, regulating internal resident comfort becomes a more critical priority. Tall buildings are susceptible to lateral movement caused by high winds—which we've seen plenty of lately—and earthquakes. While the latter isn't of much concern in Toronto, local engineering firm [Kinetica](#) has engineered a damping system that enhances both wind and seismic performance, and it's now being installed at [Canderel Residential's YC Condos](#).



Thank you.

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Entrepreneurial knowledge transfer

Charlotta Nordenberg

Innovation Advisor of Örebro University

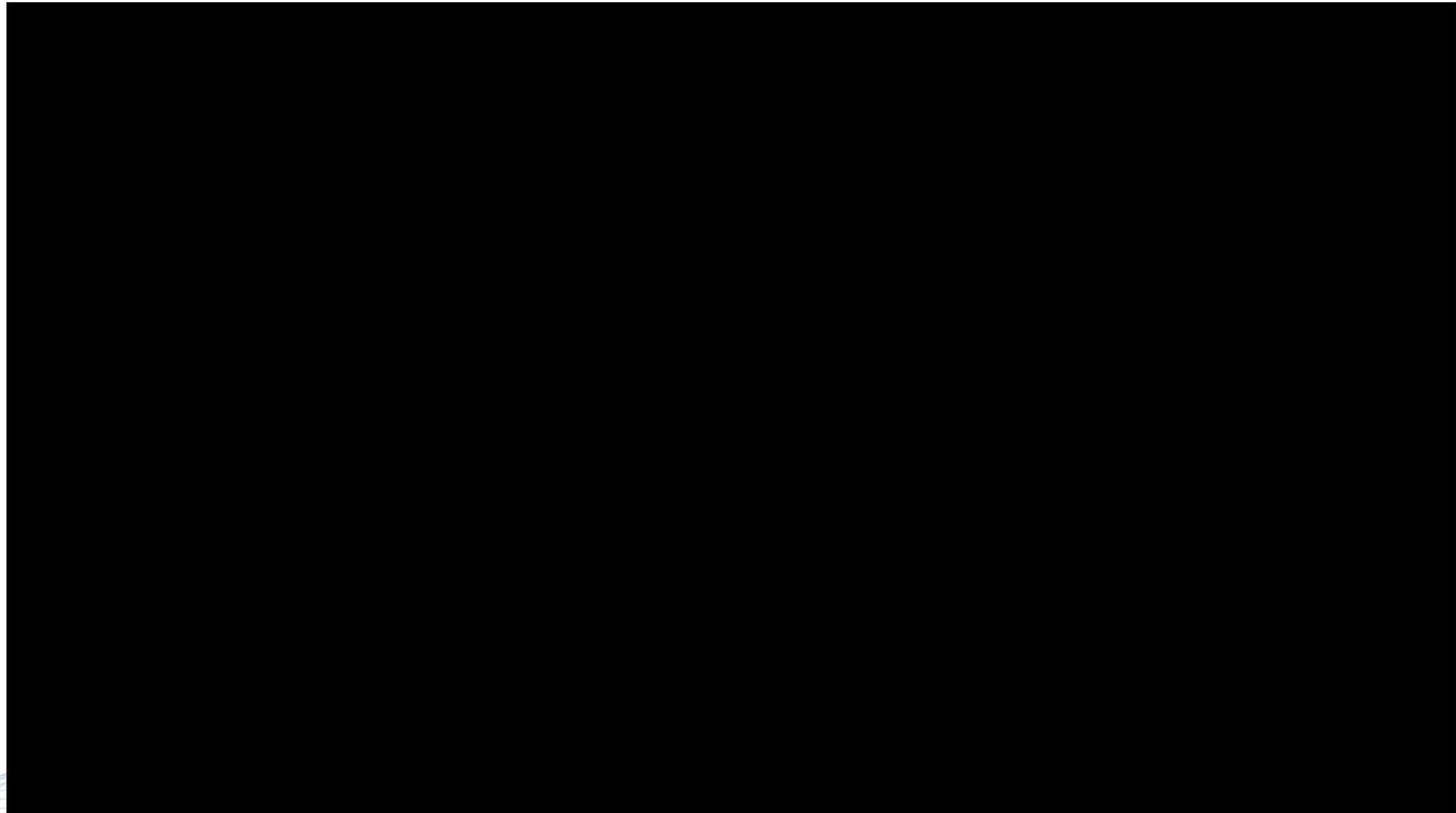
Holding AB, Sweden



**Knowledge Transfer for Impact
– the Swedish model**

Charlotta Nordenberg

Moonlighting Industries AB – Örebro University Holding AB/ INKUBERA



Facts and figures Örebro University

- 15,500** students
- 80** degree programmes
- 600** single courses
- 1,300** members of staff
- 110** professors
- 400** doctoral students
- 3** faculties
- 8** schools



Innovation

Students and researchers supported from idea to commercialisation – thanks to Örebro University's structure with:

- Innovations support Office
- Holding company
- Science Park
- Business incubator



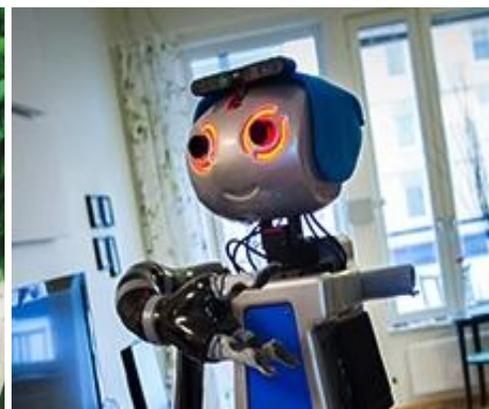
Four research examples



- Environment



- Psychology

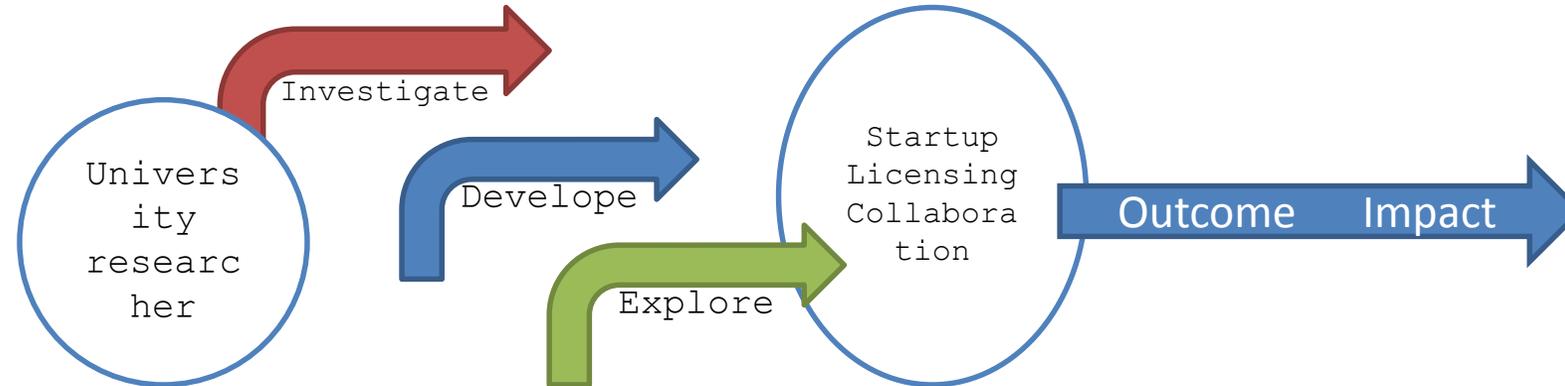


- Robotics



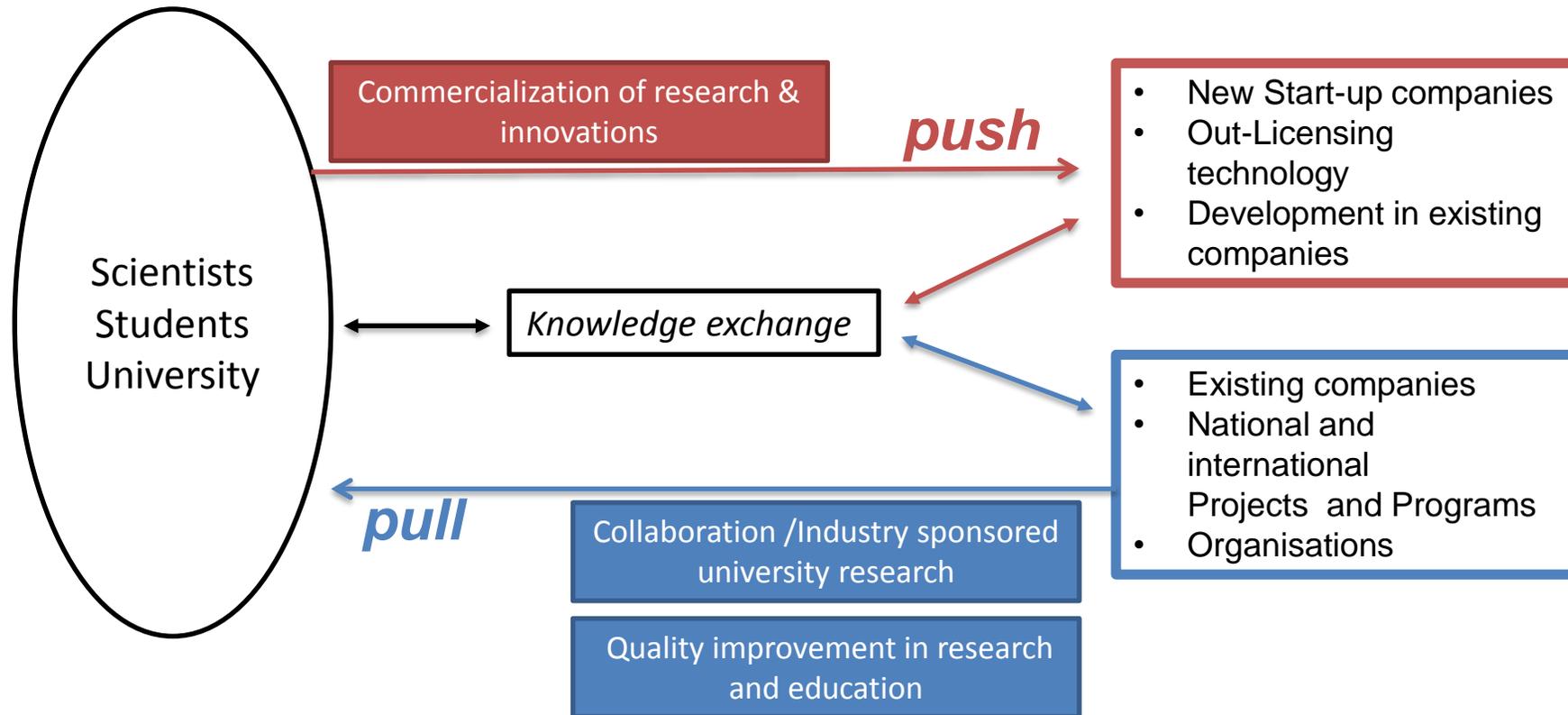
- Medicine

Roles of Knowledge Transfer Office (Innovation support office) in Sweden



- Core role of ISO is to assist public research organizations in managing their intellectual assets and facilitate their transformation into benefits for society.
- **Help to bridge the gap between research and innovation**
 - establish relationships with firms and community actors
 - generate funding from private sponsored research or consulting
 - assist on all areas related to entrepreneurship and intellectual property (IP)
 - facilitate the formation of university-connected start-up companies
 - generate royalties for the public research organization

ISO - Innovation Support Office - Sweden



Government decision about Innovation offices was taken in 2009.
Principle the same but universities organise a bit differently in their context and region.

Important Differences



Tech Transfer Office (TTO)



- The Bayh Dole Act
In general, IPR generated by public funds (= at a university) is **owned by the university**.
- TTO/University receives royalty from outlicensed IPR, and royalty is usually shared with inventor(s) who receive a smaller part (10-15 per cent).
- Highly specialized TTO professionals at university work to protect the discovery and to turn it into a commercial product or service for the benefit of the university.
- **The TTO has final say**
Divesting, out-licensing, collaboration with companies, investing in start-up companies.

Innovation Support Office (ISO) & Holding Company (HC)



- The professors privilege
In general, IPR resulting from university research is **owned by researcher(s)**
- ISO & HC has highly specialized technology transfer professionals to help the researcher to protect the discovery (=IPR) and to turn it into a commercial product or service. Give advice only.
- **The researcher has final say**
Out-licensing, collaboration with companies, setting up & financing new company.
- HC may take equity when investing in a start-up.
- HC may invest in the start-up company or in the licensing project but on strictly commercial grounds.

Pros and Cons

– US versus Swedish model of IP ownership

Tech Transfer Office

Pros

- Discoveries/inventions are reported and exploited.
- The TTO professionals takes decision regarding development and out-licensing of technology or starting a company.
- University receives financial return

Cons

- Could be less motivating for researchers
- University-biased vs independent research
- The financial risk is on the university (initially).

Innovation support Office & Holding Company

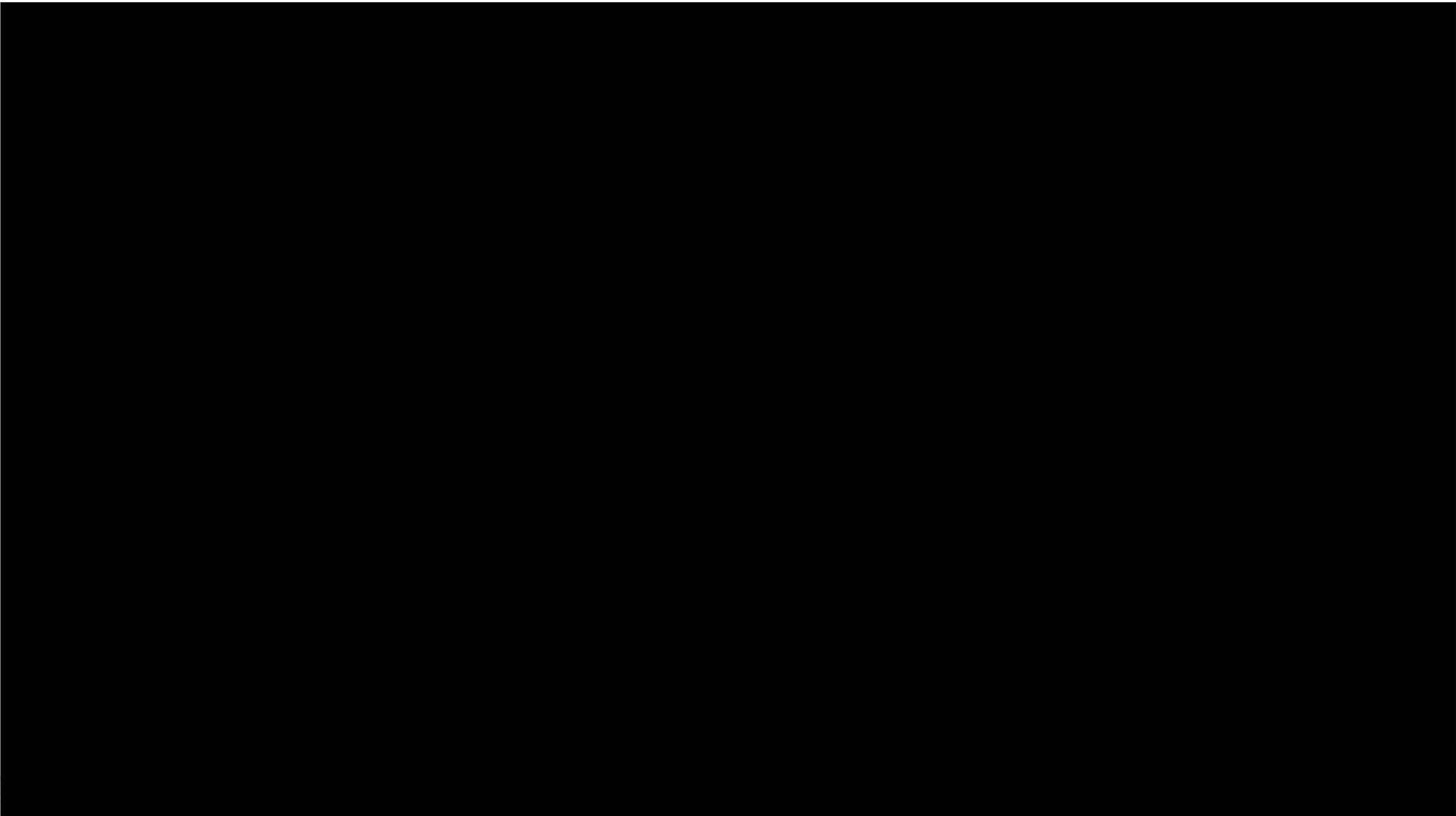
Pros

- Financially motivating for the researcher
- University gets less involved - as decision rests with researcher(s)
- The financial risk is taken by the researcher

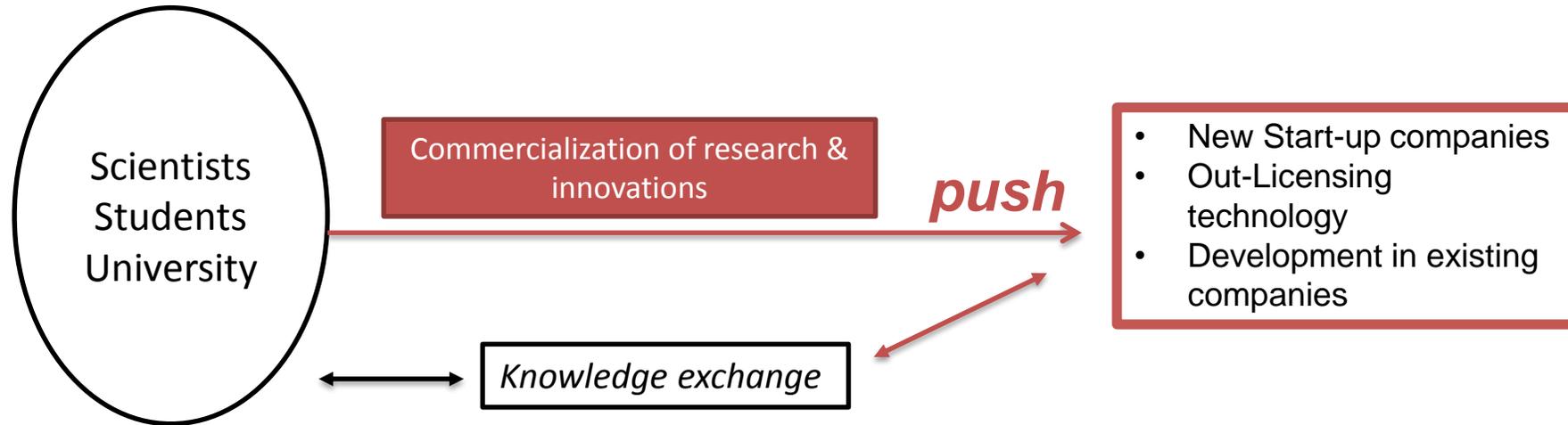
Cons

- Discoveries may not be reported or properly exploited because of the financial risks to the researcher.
- University will not receive return on its research costs.
- Holding company may get financial return on a successful investment but may also refrain from investing. The researcher must then find external financing.

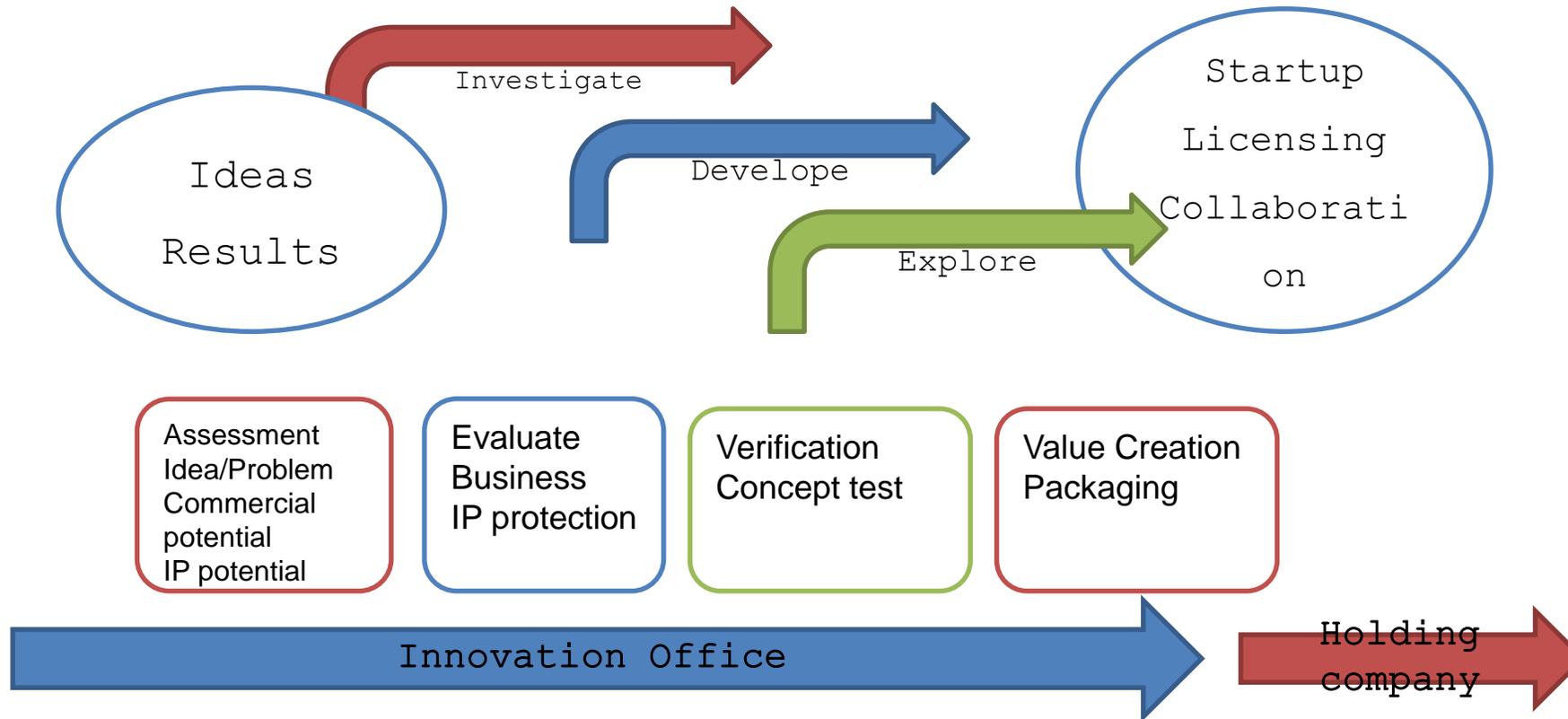
Rapp AB, E- health innovation by professor Ulrica Nilsson



Example PUSH - Sweden



Define a key processes to create value taking research result and ideas forward



“Community for innovators”

Target group:

Researchers from different disciplines

Meeting:

Lunch meetings 4-5 times per year

Purpose:

Exchange of experience, learn from each other, learn from external innovators, IP issues, succes stories, failures...

To develop as an innovator

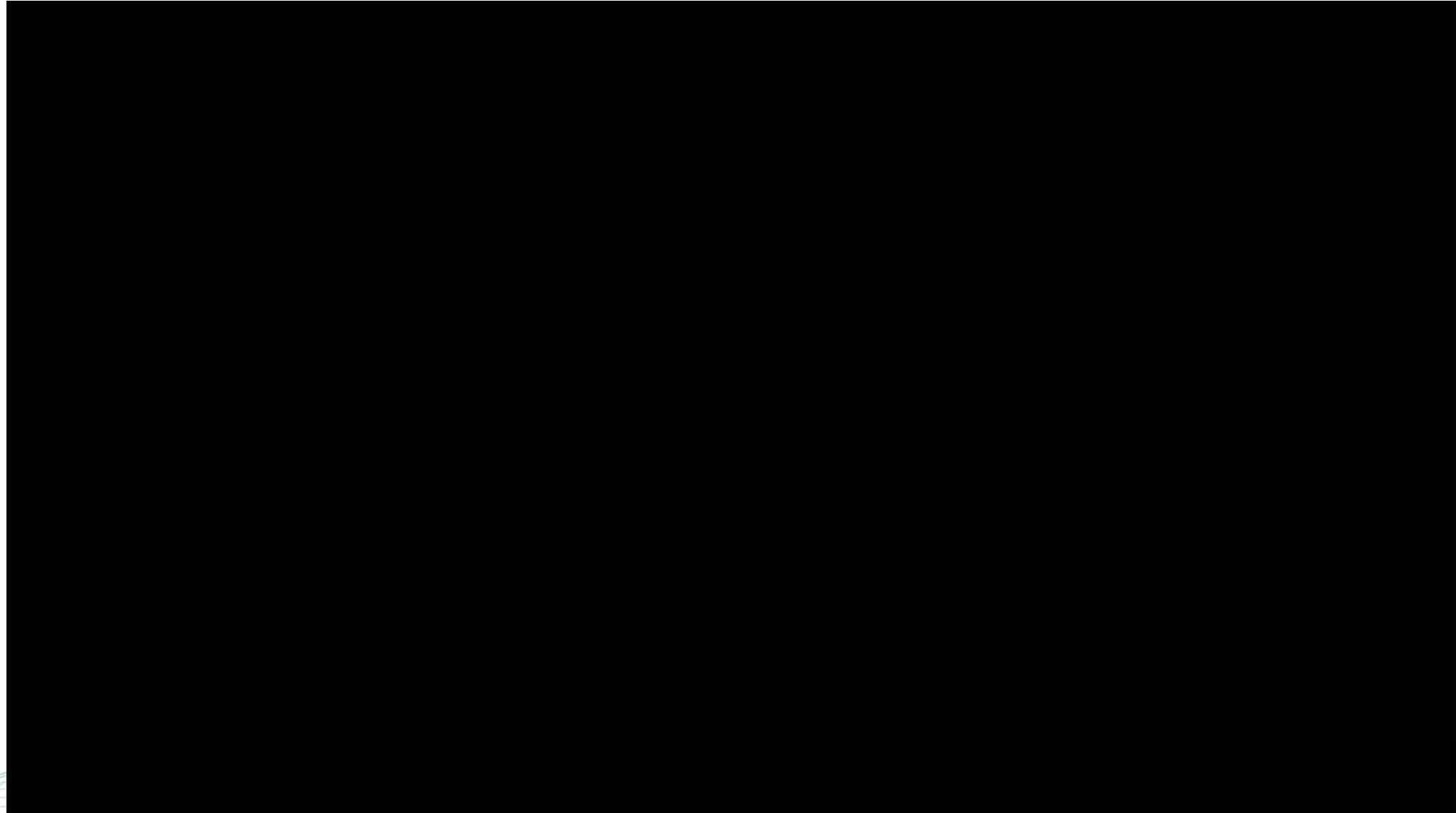
2018 The impact and utilization of Research

PhD course Innovative applications of Research and Science

- 4,5 ECTS Credits

- This course showcases a range of approaches researchers can employ to ensure that their research has impact and relevance beyond universities
- The course also provide students with tools that will help them best communicate the value of their work to research funders and potential investors.
- Impact, Open Access, Networks, Social entrepreneurship, Innovation in the public sector IPR, Funders views of utilization, VCF...

Dance for health – Anna Duberg, Resercher at Örebro University





Thank you!
charlotta.nordenberg@oru.se

Entrepreneurial knowledge transfer

Tamika Heiden

Principal of Knowledge Translation Australia

mashroom.6

Entrepreneurial Impact



Knowledge
Translation
Australia

“

“Impact shows that’s that people knew what to do with the knowledge you shared”

Professor Melanie Barwick

“Impact happens at the level of the user”

David Phipps



Knowledge
Translation
Australia

Start-up entrepreneurs have very little:

*Time, money, resources
& support*

But they want to have an impact!

RESEARCHER?



AN ENTREPRENEUR
SEES A PROBLEM AND
DEVELOPS A
PRODUCT OR SERVICE
TO SOLVE IT

It begins with an idea

Entrepreneur

- Based on experience
- Solution to a problem
- A need for something

Researcher

- Based on research experience
- A solution to an issue or problem
- A need to:
 - Fix,
 - Find, or
 - Explore something

PLANNING THE JOURNEY

Entrepreneur

- Vision, mission, values
- Business plan
- Marketing plan

Researcher

- Vision, mission, values
- Translation & impact planning
- Communication/dissemination planning

TEST AND REFINE

Entrepreneur

- Market research
- Does the solution exist elsewhere?
- Is it wanted or needed?

Researcher

- Stakeholder consultation (market research)
- Literature review (what exists?)
- Barriers and facilitators to uptake

STRATEGIC PARTNERSHIPS

Entrepreneur

Partner to:

- Build or increase credibility
- Increase reach, obtain a new audience
- Bring value to the business.

Researcher

Who is on the team, who do you need?

- External, non-academic partners, co-production
- Partners that bring value to the research.

DEVELOP/CREATE/BUILD in collaboration....

Entrepreneur

- Develop a product or service that provides a solution to a problem (high quality)
- Manage/nurture strategic partnerships.

Researcher

The research process:

- Quest for answers (high quality science)
- Provision of new knowledge or solutions
- Management of strategic partnerships

MARKETING AND SALES

Entrepreneur

- Market a product or service
- Audience messaging
- Communication, sharing of information
- Understanding customer, needs, wants and preferences

Researcher

- Publish – peer review
- Communicate/disseminate – conferences
- Non – academic translation
- Market/audience tailored messages and outputs
- Understanding stakeholder needs “sales”

SUMMARY

ENTREPRENEUR

IDEA

MARKET RESEARCH

STRATEGIC PARTNERING

SOLUTION CREATION /
DEVELOPMENT

MARKETING & SALES

IMPACT

RESEARCHER

IDEA

WANT/NEED RELEVANCE

COLLABORATIONS/CO-CREATION

RESEARCH PROCESS

DISSEMINATION/ IMPLEMENTATION

RESEARCH IMPACT



Thanks

Any questions?

You can find me at @ktaustralia

Or email theiden@ktaustralia.com

