



Tecnológico de Monterrey  
Escuela de Ingeniería y Ciencias

# *Innovation Hub China*

EIC Update

June 2019

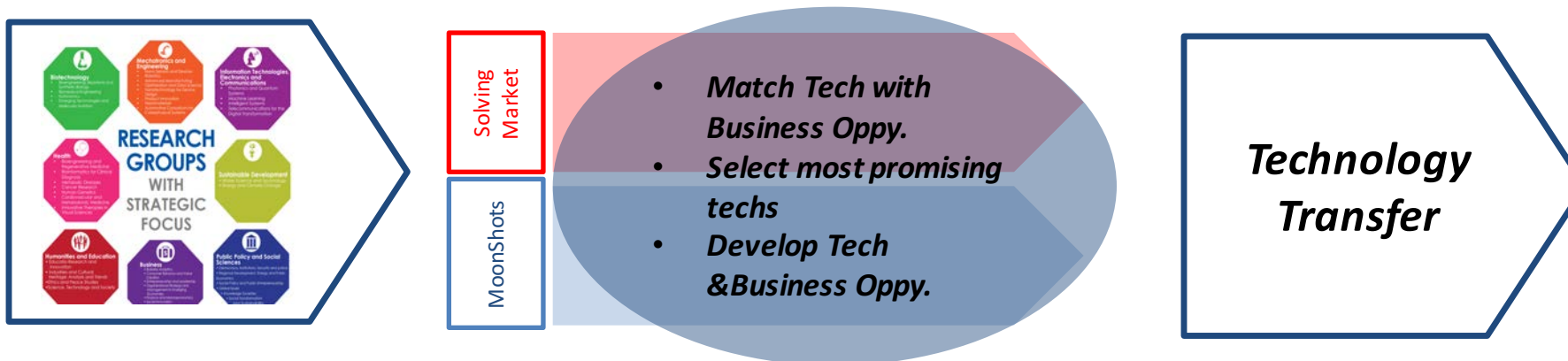
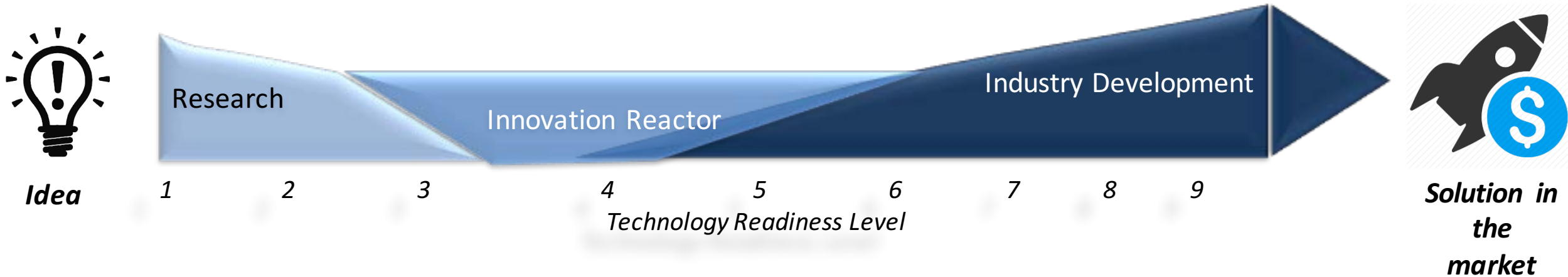


Tecnológico  
de Monterrey

INNOVATION  
HUB  
CHINA

# The Innovation Gap

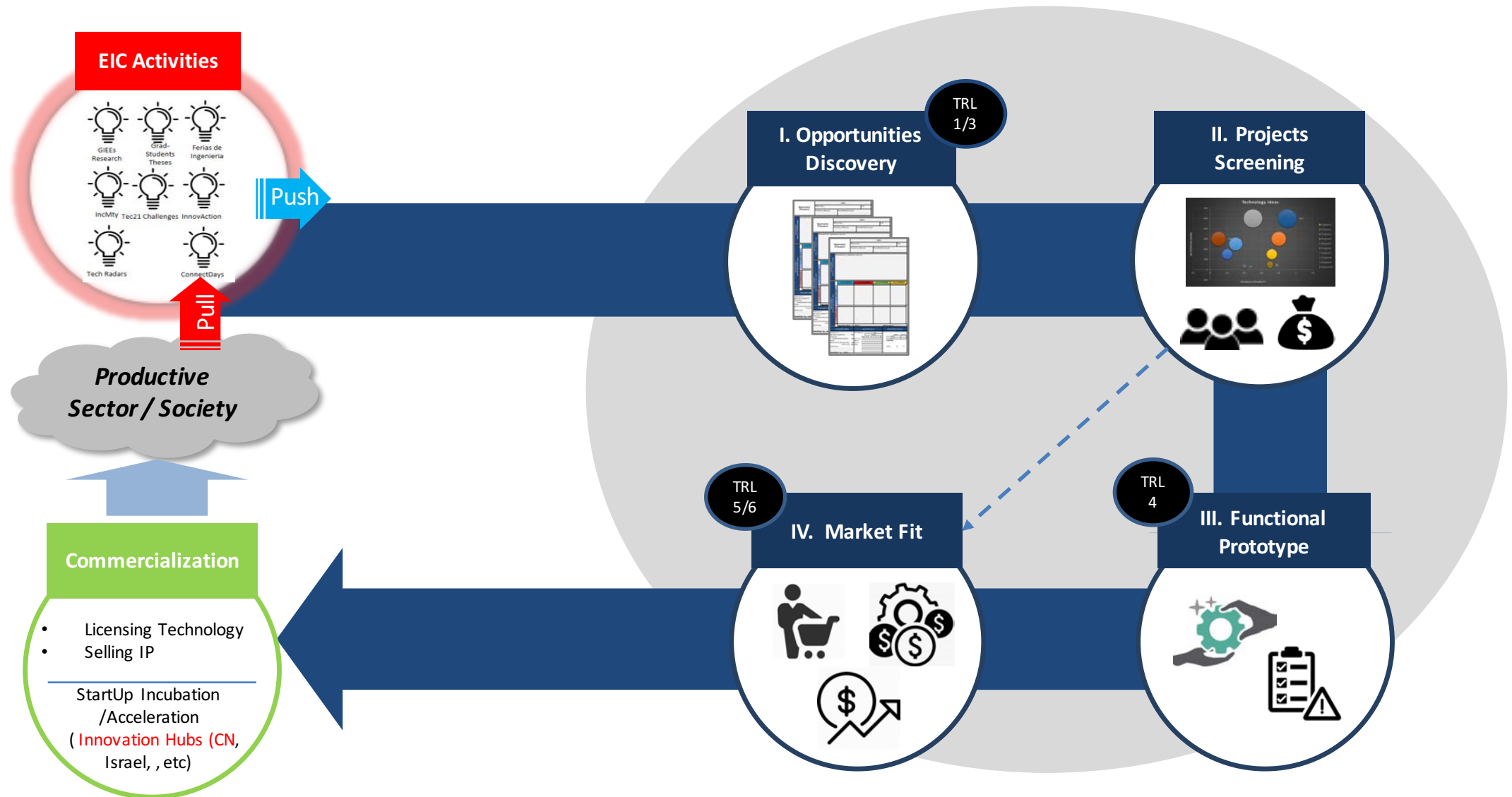
## The big challenge from Lab to Market



**Targeting both the Solution of current markets pains (Market Pull) and Bringing New-to-the-world Solutions (Tech Push)**

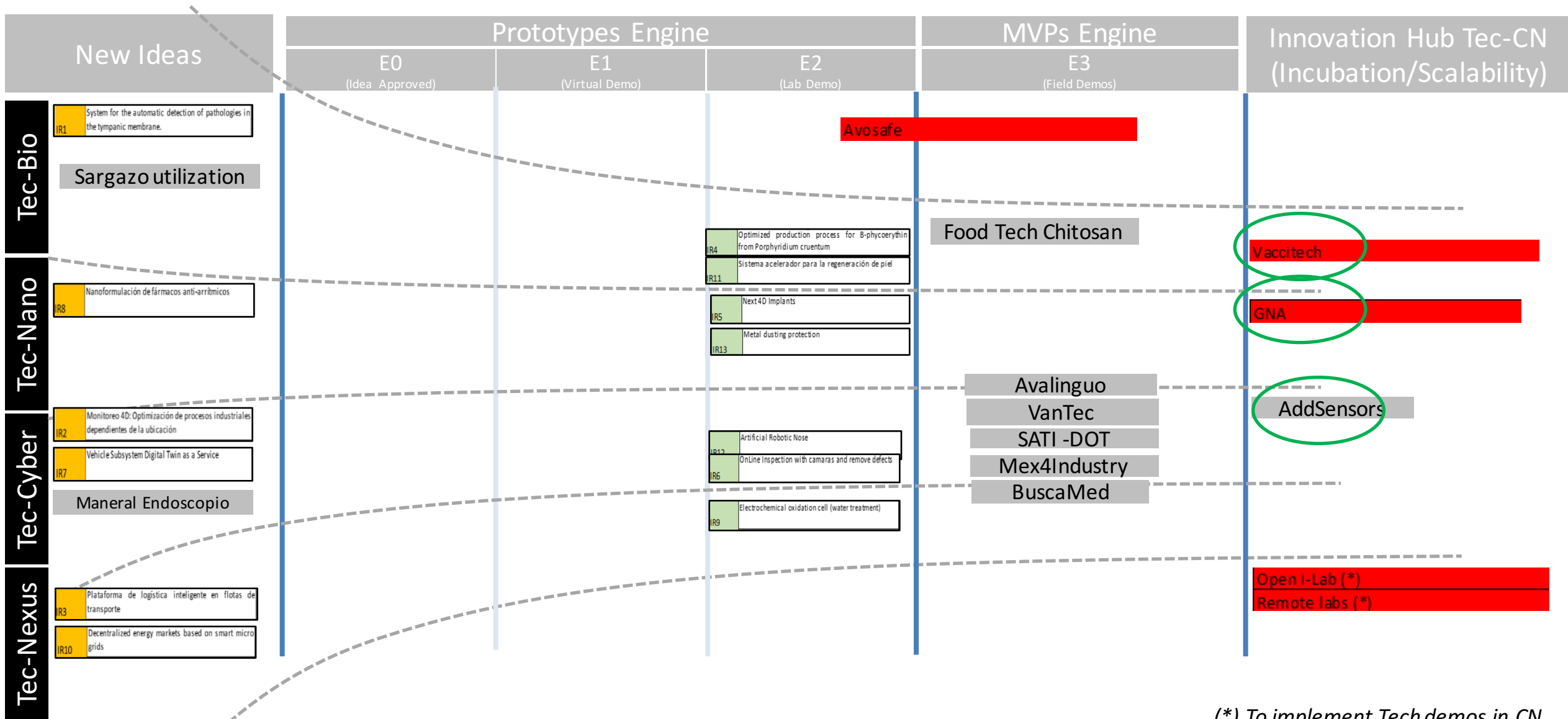
# Innovation Reactor Ri2ve

Four steps seeking assertive and accelerated conversion of Sci-Discoveries/ideas into solutions for Industry and Society



# Innovation Pipeline

Status by Jun 2019



(\* ) To implement Tech demos in CN

# Tec Innovation Hub China



“The **Instituto Tecnológico y de Estudios Superiores de Monterrey**, in its 2020 Strategic Innovation Plan, defines as a strategy: the creation of **Innovation HUBS** that support the fourth industrial revolution, guaranteeing more and better opportunities for employment, economic growth and strengthening of its educational model.”

*“With this new space, Tecnológico de Monterrey kick off it’s initiative of Global Innovation HUBS starting with China, looking for the talent attraction, the generation of knowledge, the development of innovative products, and the creation of global technology-based companies.”*

Arturo Molina, PhD., Vice Rector for Research, and Technology Transfer.

## WHY TEC DE MONTERREY CREATES AN INNOVATION HUB IN CHINA?

According to the OECD and according to the [Global Innovation Index 2018](#), China ranks 17th. in the world ranking in innovation, as well as the nation with the highest growth in science and technology investment in recent years. According to the figures of the World Bank, the country invests 2.11% of its Gross Domestic Product in Research and Development.



*Faster and cost competitive vaccines production*

# The problem/opportunity

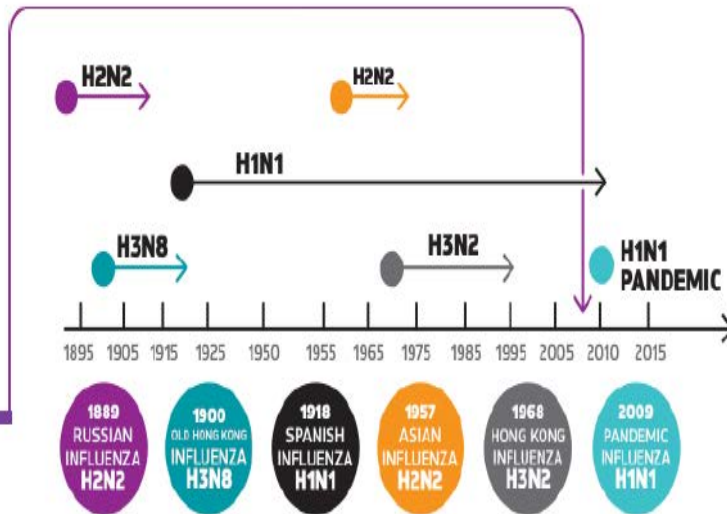
## FLU - A COMMON KILLER

## THE PAIN

High flu virus mutation frequency and its ability to recombine with other influenza virus, can turn them into deadly pandemics. Each year, the World Health Organization (WHO) selects antigen subtypes that are representative of strains that are found circulating in humans for development into vaccines.

**284,000**  
People DIED  
for FLU

Between 2009-2010



With virulent virus strains even healthy people will demand vaccinations requiring hundreds of millions if not billions of doses. Human influenza B viruses: not subject to pandemics.

## VALUE PROPOSITION

**16X  
FASTER  
100X  
CHEAPER**

To satisfy the high demand of doses for the prevention of infectious diseases worldwide, it is necessary to revolutionize the process of vaccines mass production.

Our technology offers a **16 times faster production and 100 times cheaper than some current technologies.**

It is like going from telegraphs to smartphones.

Also VACCITECH can create a Master Cell Bank of typical virus strains to use for on demand start up of needed vaccine production.



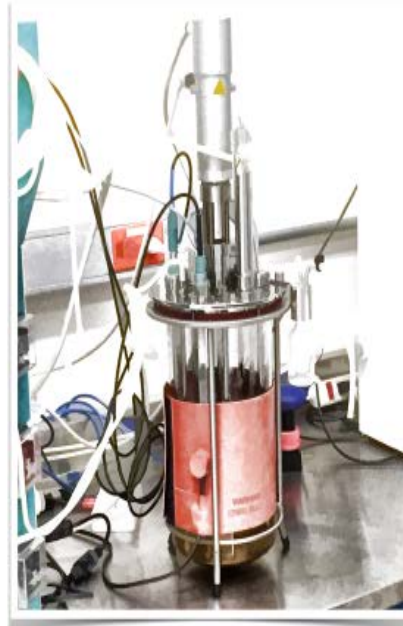
<https://youtu.be/jOGDgLnbEgl>

## ON DEMAND MASS PRODUCTION

## THE SOLUTION

Once our technology is proven successful, our VACCITECH bioprocess will have the following advantages:

1. Uses proprietary Engineered Cells and Bioprocesses for recombinant vaccine production.
2. Production time reduced to 2 weeks. (1/16 of current egg based production).
3. Reduced production time allows for more accurate identification of migrating virus strains for producing more effective vaccines.
4. Cost per dose is greatly reduced. (1/100 of current egg based production).
5. Low cost allows for single sterile dose packaging with no preservatives.



## Technology Readiness

Currently working on rapid mass production platform for Influenza Vaccine Using proprietary Engineered Cells and Bioprocesses for recombinant vaccine production.

- TRL3. First Lab test completed
- TRL4. Small scale and functional prototype
- TRL5. Prototype validated in the field
- TRL7. Demonstration system in real conditions, pre-commercial scale
- TRL9. Technology available for consumers

Lab Production set up

[https://youtu.be/XRnof5g\\_wwQ](https://youtu.be/XRnof5g_wwQ)





## Status for Business Creation

### In Mexico:

Founded in 2015 as Bi-National Company operating in California USA as Vaccitech and as RyR Bioprocessos in Mexico, active looking for investments and GRANTS opportunities in USA.

### *Next Steps:*

1. Looking for 3M USD Investment for preIND FDA trials.
2. Work over regulation issues (IND FDA).
3. Networking with Big Pharma Industry in order to Tech Transfer in some IND stage.

### In China:

Looking in Chinese ecosystem for: University Endorsement, JV with Industrial Pharma Partner and VC for 3M USD Investment.

### *Next Steps:*

1. Animal Pharma Exploring as pathway to Scale up the business
2. Looking for investment VC
3. Looking for Endorsement from Academics



*Nanolubricants reducing operation cost for cutting and forge process*

# The problem / opportunity



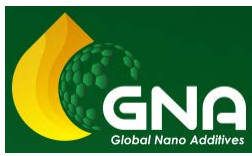
Conventional lubricants include EP-AW additives that are nowadays **inefficient**, which are **technically limited** for their optimum performance, due to them needing very specific temperature and pressure ranges and **easily degradable**. Likewise they are **toxic** to the **environment** when disposed.



**Substituting** conventional additives with **nano additives** which are **highly efficient** and **do not have technical limitations** in regard to operating pressure and temperature and can **perform** in **extreme conditions** such as 800°C. They are **not toxic**, they are **immune to bacteria proliferation** and remain **inert when disposed**.

<https://www.youtube.com/watch?v=E4KMbDPCqHk>

# The Solution and value proposition



*GLOBAL NANO ADDITIVES SAPIDE CV (GNA) is a technological based company focused on the development of lubrication technology based on nano additives, which, take advantage of the nano exfoliation and tribosynerization effects, filling the metals' micropores and forming a protective solid layer which allows the decrease in wear and friction between the contact surfaces.*

*Our nano additives do not have technical limitations in regard to operating pressure and temperature and they inhibit metal oxidation.*

*Furthermore, they are not toxic, and they remain inert when disposed.*

<https://www.youtube.com/watch?v=E4KMbDPCqHk>



- Our metal-working fluids, compared with other conventional lubricants (Such as Mobil, Shell, Castrol, etc.) **increase the useful life** of tools **by 300%**.
- **Decrease in** lubricant's **consumption by 70%**.
- Allows the **decrease** in machining's cycle times, increasing productivity in CNC machines.
- Our metal-working fluid enables the attainment of **excellent superficial finishings**, which increases the finished product's quality and decreases the need to re-work.
- Finally, using our nano additives, the **bad odours** and **skin irritations** in the operators are considerably **reduced**, improving hygiene and health at the workplace.

## ATOM LUB FORGE

Extreme temperature lubricant and mold release agent based on nano additives with 80% less carbon content, that forms an adhesive film, oxidation resistant that provides and preserves high lubricity at temperatures of up to 1,250°C. Widely used for dice lubrication, billet coating and designed specifically for the forging industry.



## ATOM LUB CUT

Metal-working lubricant based on extreme pressure and antiwear nano additives, chlorine free. This product has excellent anticorrosion properties and withstands 200% more pressure than conventional lubricants. Widely used in metal-cutting, stamping, die-cutting, drawing, and lamination processes, as well as gear systems. It can be used directly or diluted in water, depending on its application.



## Technology Readiness

Successful technology verified in lab and in the field with real applications and industry standards.

Since 6 months ago, more than 100 CNC machines are using the product

- TRL3. First Lab test completed
- TRL4. Small scale and functional prototype
- TRL5. Prototype validated in the field
- TRL7. Demonstration system in real conditions, pre-commercial scale
- TRL9. Technology available for consumers

## *Activities in Mexico*

- Company operating at pilot plant level.
- 105 CNC machined using Atom Lub Cut for the past 6 months (sales of 800 L/month)
- Ongoing negotiations with distributors.
- First approaches with BOCAR, METALSA and FRISA.
- *Next Steps:*
  - 1. Close the year with sales of at least 5,000 L/month.
  - 2. Raise serie A capital to continue developing the products' portfolio.

## *Activities in China*

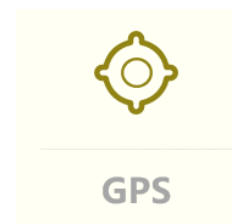
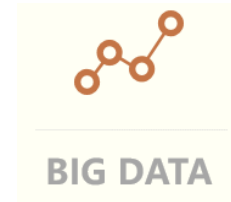
- Company's constitution in progress.
- 50% progress with the attaining of certifications and information for the Chinese market
- Customers scouting
- VS scouting
- *Next Steps:*
  - 1. Look for a commercial ally.
  - 2. Attain seed capital for operation and for R&D.



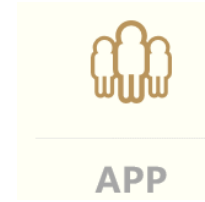
*Evidence-based food safety*  
(Sponsored Applied Research Project)

# The problem/opportunity

## Customer pains



**Intelligent Monitoring Platform**





# The product / value

Design and Implement a functional prototype verified in the field for remote monitoring of water temperature, oxygen in water and filtering system pressure. Field test will be implemented in 10 transport trucks for trips of 20 hours maximum.



**Its main functions include: filtering, temperature regulation and oxygen production during transportation. Through PLC automatic control to replace the traditional transport box manual operation of the time-consuming and laborious cumbersome process; Through the network connection integration aquatic product transportation industry chain, the long-distance monitoring water tank each kind of movement condition. Through the development of APP, it can display the data status of the transport box in real time on the mobile APP, receive data feedback data in a timely manner, and collect data to calculate the development status of the whole aquatic industry or local areas, so as to provide data support for the development of the aquatic industry.**

# Value proposition



# Timeline

## Ongoing activities:

- Development contract signature : Jul 2019
- Outstation Project team in CN: Aug 2019

Activities/Task	Week number																																						
	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20																									
E0: Project Definition																																							
E1: Concept Definition & Design (TRL 1)																																							
E2: Functional Prototype (TRL4)																																							
E3: Field test Verification (TRL5)																																							