

Edible vaccines

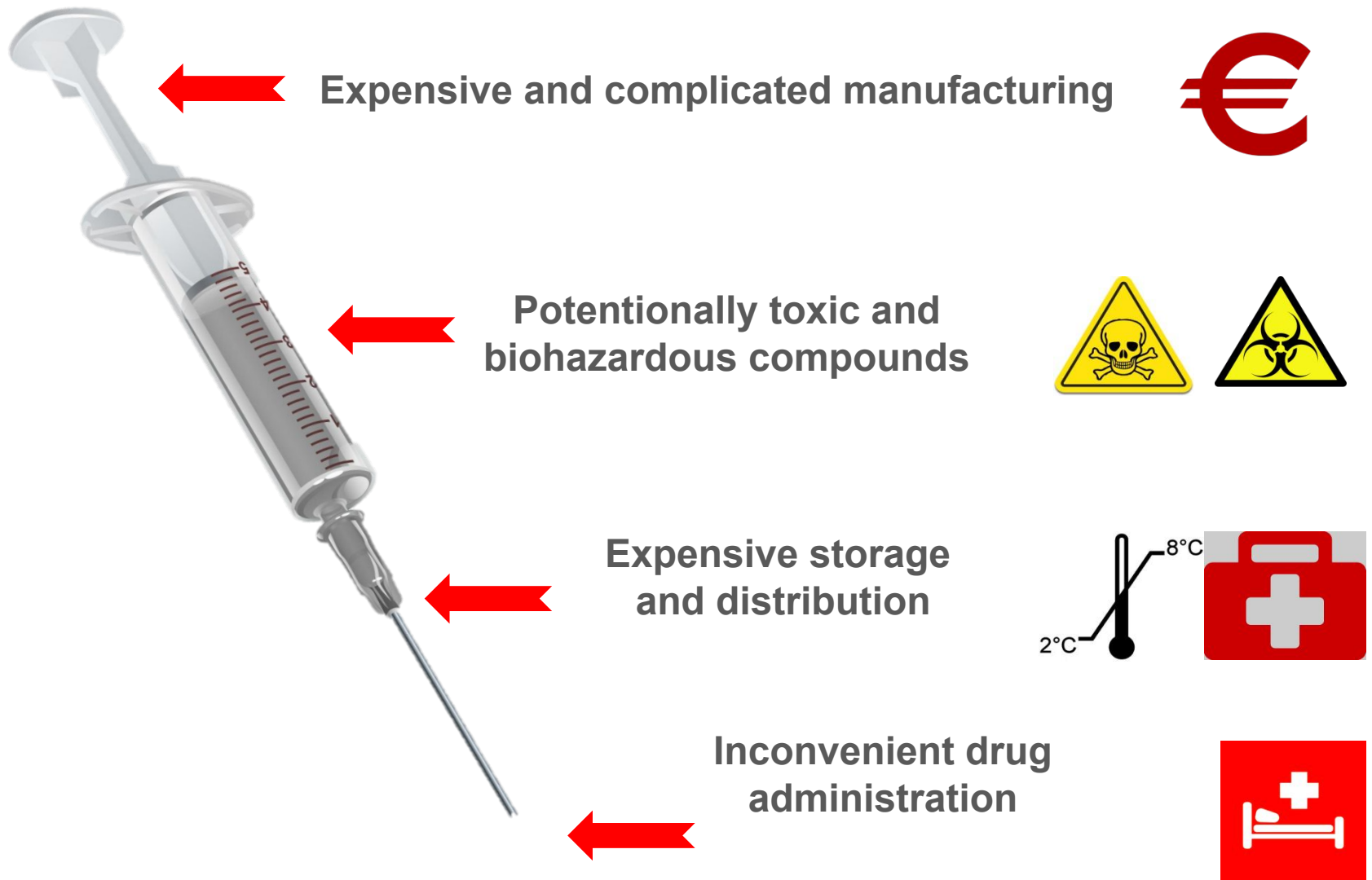
Maryna Korshevniuk

***We increase the
accessibility of
medical
compounds***

**Few leaves – a doze
of medicines**



Typical vaccines

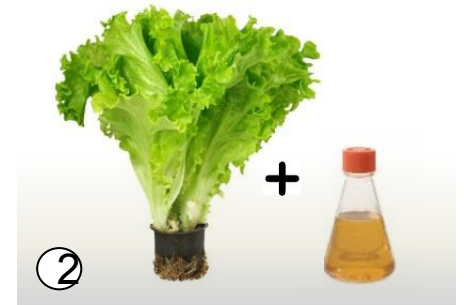


Principle

Human and animal obtains the dose of drug or immunization by eating transiently transformed salad in fresh form. Efficiency of oral administration of this type of vaccine for number diseases had been proven.



Growing non GM plants



Agrobacterium-mediated transient transformation

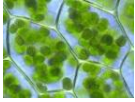


Sustaining in right conditions for target product accumulation



Harvesting and eating

Advantages



Drug bioencapsulation – ready to use



Easy to scale the production



Rapid response production



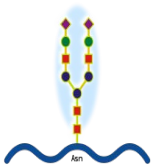
No animal products and their pathogens



Manufacture different types of product in a single facility



Much more cheaper than using other expression systems (about **0.1%** of mammalian cell cultures)



Post-translational glycosylation of target proteins (instead bacterial expression system)



Difficulties



Bioequivalence estimation



Biosafety issues examination



Efficiency of oral administration



Difficulties with accumulation level control and normalizing



Plan

Obtain reproducible results with inedible plant *N. benthamiana*



Building laboratory-greenhouse complex



Know-how included documentation is ready to transfer

NOW

Build



Obtain results with edible plant
Lettuce
Chrysanthemum
Lemna
Valerianella



Investigation of biosafety and bioequivalence issues



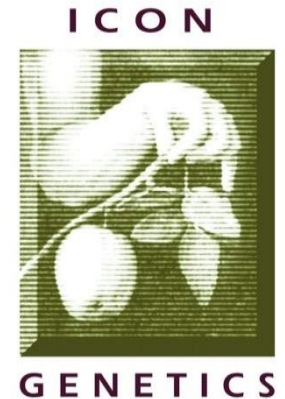
Needs

- Investments for building laboratory-greenhouse complex
- Collaboration with other institutes for further investigation of bioequivalence, biosafety issues, and efficiency of oral administration

Example

Icon Genetics

- spent over **€80 M** in R&D (2006-2011)
- raised over **€26 M** (VC, grants, successful exit)
- **€55 M** acquisition by **Bayer** the part of Icon Genetics (2006)
- the second part has been acquired by **Nomad Bioscience** (2011).
- **€75 M** acquisition by **DENKI** (2015)
- own GMP-manufacturing unit



Team members



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