



# PCI BIOTECH

Unlocking the potential of innovative medicines

## Anglonordic Conference

London, MAY 19, 2016

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# PCI BIOTECH

## ► Important notice and disclaimer

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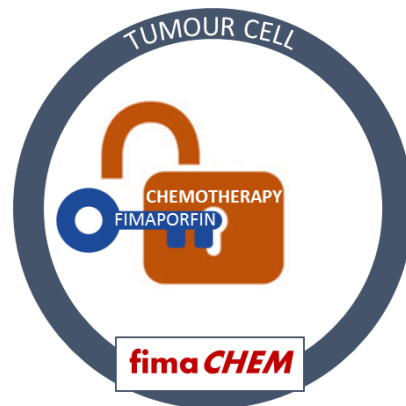
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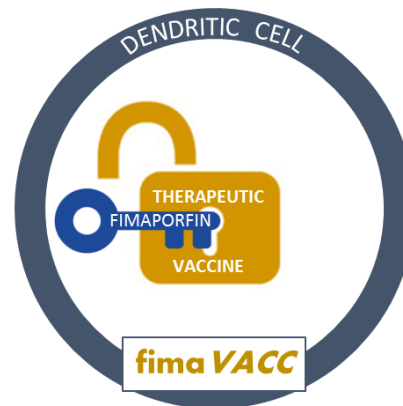
# PCI BIOTECH AT A GLANCE

## ► Unlocking the potential of innovative medicines

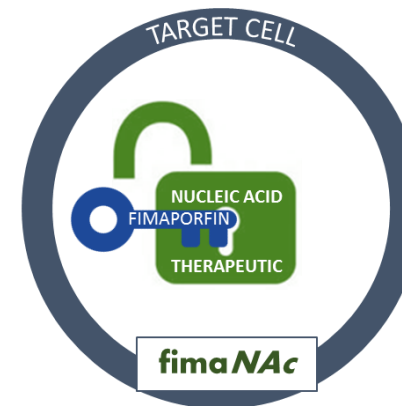
- A listed (PCIB:NO) cancer-focused biotech company
- Photochemical internalisation (“PCI”) technology, originating from the Norwegian Radium Hospital
- Clinical program
  - fimaCHEM** – Phase I/II with fimaporfin (Amphinex®) for the orphan indication inoperable bile duct cancer
- Pre-clinical programs
  - fimaVACC** – Vaccination technology that provides strongly enhanced T-cell responses
  - fimaNAc** – Efficient intracellular delivery of nucleic acid therapeutics



Bile duct cancer study with promising early signs of efficacy in Phase I and Phase II about to start



Proprietary vaccination technology moving towards clinical validation, and one active research collaboration



Preclinical program with two active research collaborations, one with top tier pharma

# PHOTOCHEMICAL INTERNALISATION

## ▶ Triggered endosomal release through illumination

### STEP 1:

- Fimaporfin (S) and the active molecule (D) are injected into the body and reaches the target cells



### STEP 2:

- Fimaporfin (S) and the active molecule (D) are taken up by the cell, but D is unable to reach the target (T), as it is encapsulated in an endosome
- S is washed away from the cell membrane, but trapped in endosomes



### STEP 3:

- Light activates fimaporfin (S) in the membrane of the endosome
- The membrane integrity is affected and the active molecule released



### STEP 4:

- The active molecule (D) can now bind to its target (T) and initiate the therapeutic response



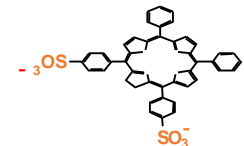
#### The active molecule

- Anticancer agent, e.g. bleomycin, gemcitabine
- Oligonucleotide, e.g. siRNA
- Protein, e.g. antibody-drug conjugate
- Peptide: e.g. antigen



#### The PCI component

- Light sensitive component
- Fimaporfin - Amphinex®



#### The target

- Target for the active molecule
- E.g. DNA, mRNA, enzyme, microtubuli

# CHEMOTHERAPEUTICS

- ▶ A cornerstone in current cancer therapy
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Worth more than  
**\$10bn**  
across the 7 major  
markets

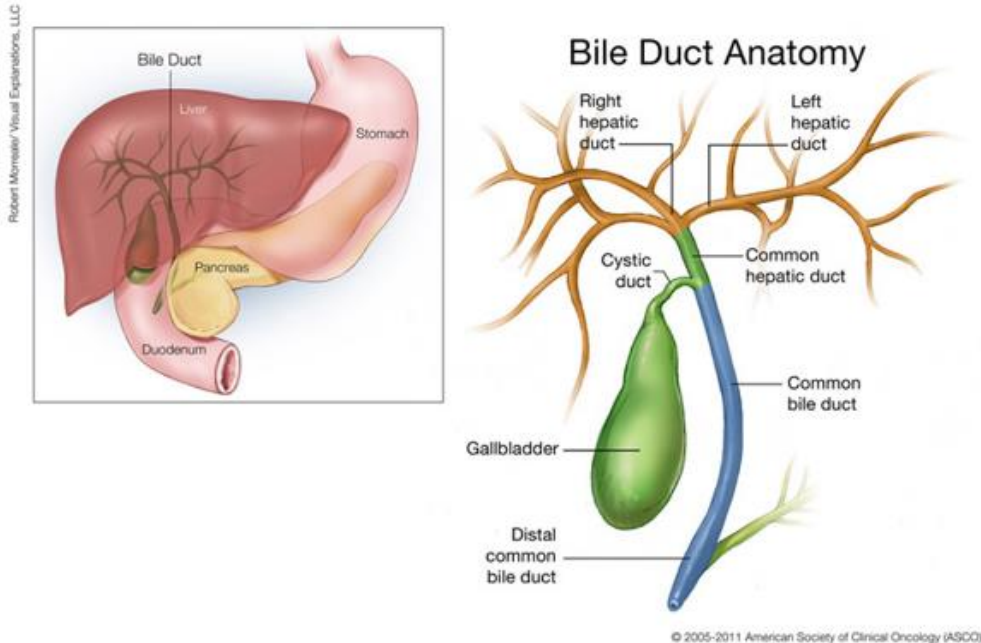
PCI may enhance  
approximately  
**20%**  
of relevant approved  
chemotherapies

Niche indications  
allow for  
**ORPHAN  
DRUG**  
applications

- ▶ **fima CHEM** may enable approved drugs to fulfil unmet local treatment needs
- ▶ Aim is to complete Phase II in cholangiocarcinoma before out-licensing
- ▶ Opportunity for development in further niche indications

# BILE DUCT CANCER

- ▶ A rare but fatal disease



- ▶ **Five year survival less than 5%**
- ▶ **Remarkable resistance to chemotherapy**
- ▶ **Estimated market potential of up to USD 500m for efficacious treatment**
- ▶ **Phase I/II trial ongoing with fimaprofin**
  - combination with gemcitabine
  - open-label, multi-center trial in up to 45 patients
  - activation of fimaprofin by intraluminal illumination

# BILE DUCT CANCER – CLINICAL PHASE I/II STUDY

## ▶ Preliminary response data

### ▶ 6 months radiology (CT) data from 3 dose cohorts

	PD	SD	PR	CR	NA*
Cohort 1	1	1			1
Cohort 2		1			2**
Cohort 3		1	1	1	
Cohort 4	Not yet available – subjects on-going				

\* Not measurable / Not evaluable by CT

\*\* Considered SD at 6 months by the investigator

- Subjects are in the study for 6 months after PCI treatment
- Dose levels given in cohort 1 and 2 are below what is expected to be effective from previous clinical experience

# IMMUNOTHERAPY

▶ A new hope for millions of patients

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Total estimated  
sales of  
**\$35bn**  
in 2023

More than  
**250**  
projects in  
development

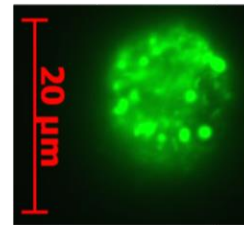
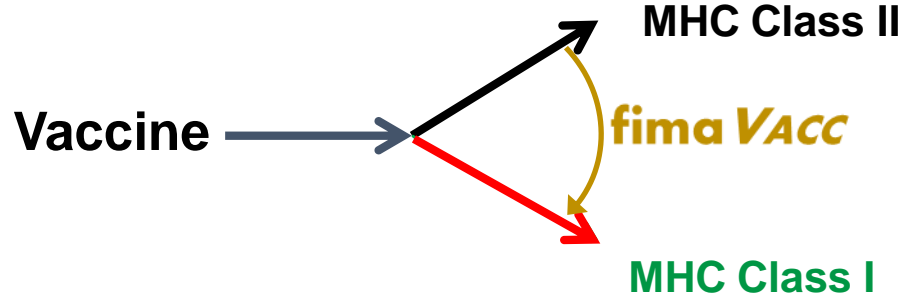
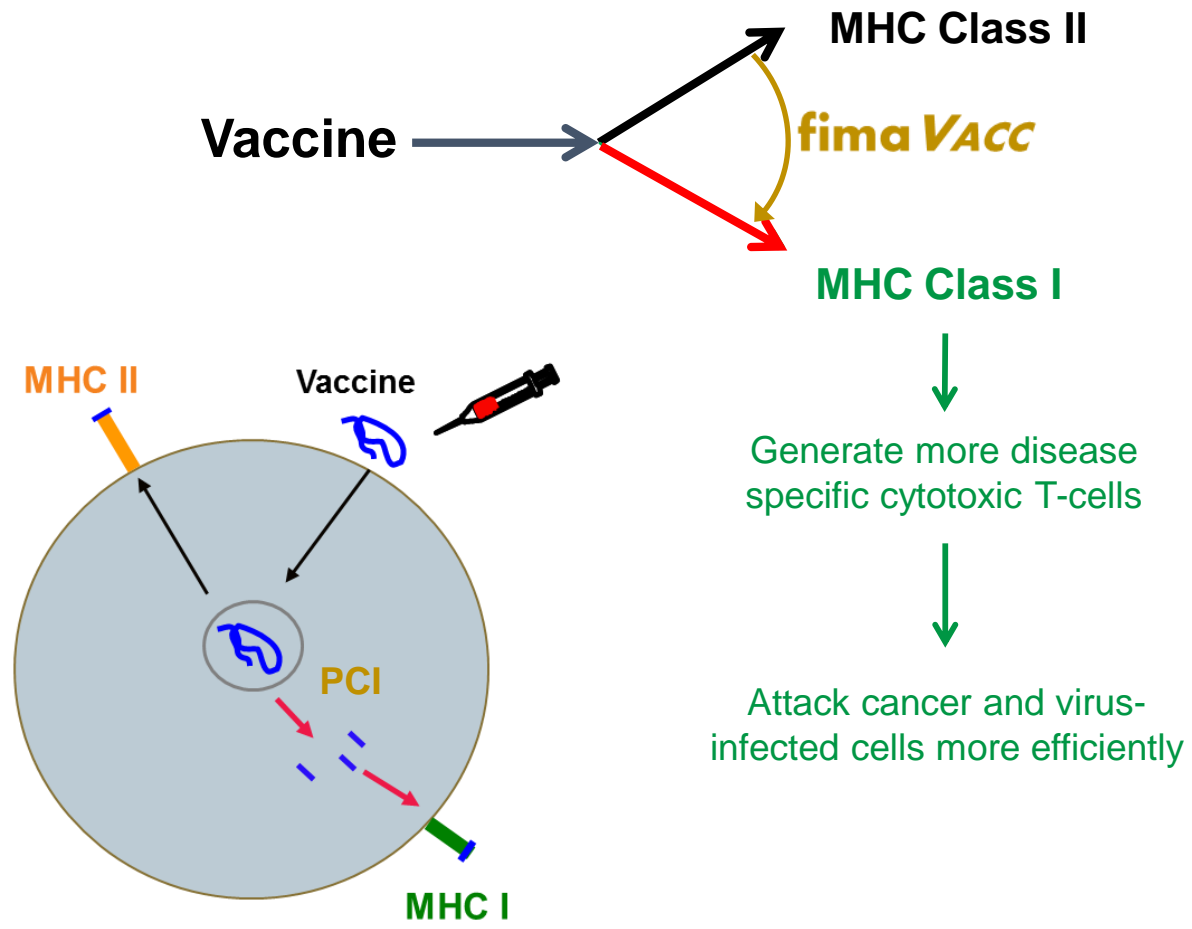
Combinations with  
**THERAPEUTIC  
VACCINES**  
may enhance CPI  
response rates

- ▶ **fima VAcc** enhances cellular immune responses important for therapeutic effects
- ▶ Moving towards clinical validation, potentially in healthy volunteers
- ▶ Opportunity to develop own therapeutic vaccination products

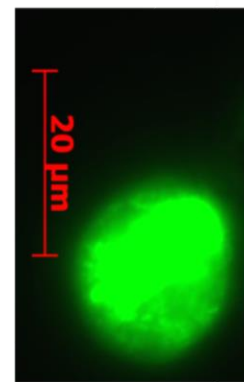


# PCI FOR VACCINATION

► Enhancing cytotoxic T-cell response by light-induced cross presentation



Antigen in endosomes



After fima VACC treatment

Ovalbumin antigen in JAWSII dendritic cells

Generate more disease specific cytotoxic T-cells

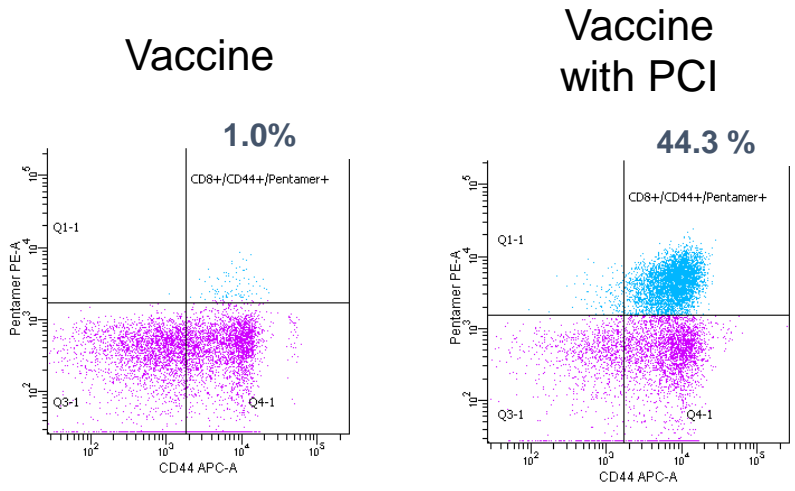
Attack cancer and virus-infected cells more efficiently

# THERAPEUTIC VACCINATION

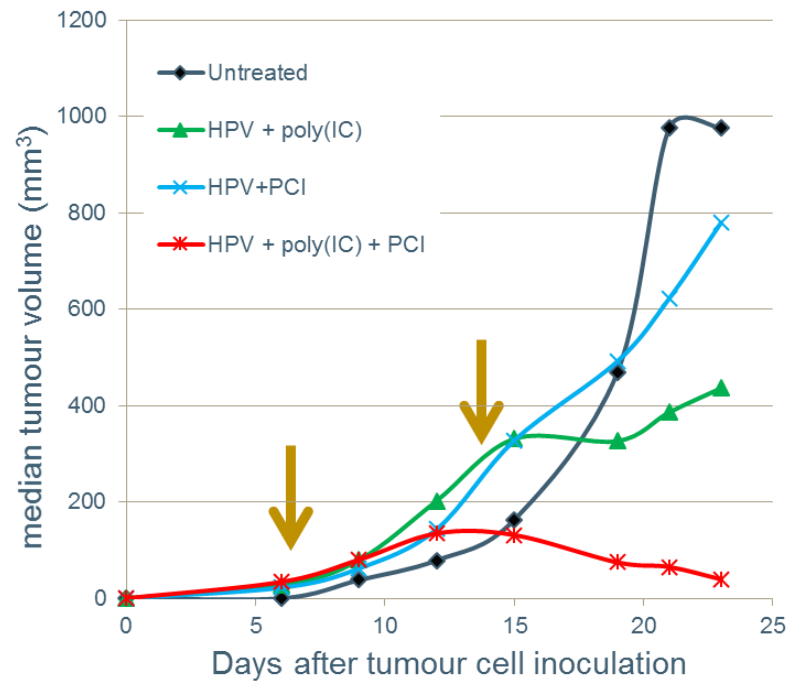
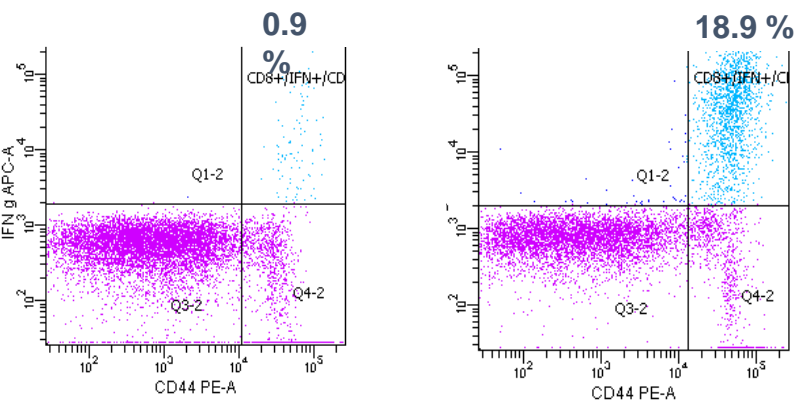
► *In vivo* immunisation with HPV long peptide

fima VACC strongly enhance CD8 T-cell response and induces strong anti-tumour response

HPV pentamer in blood samples



IFN-γ in spleen cells

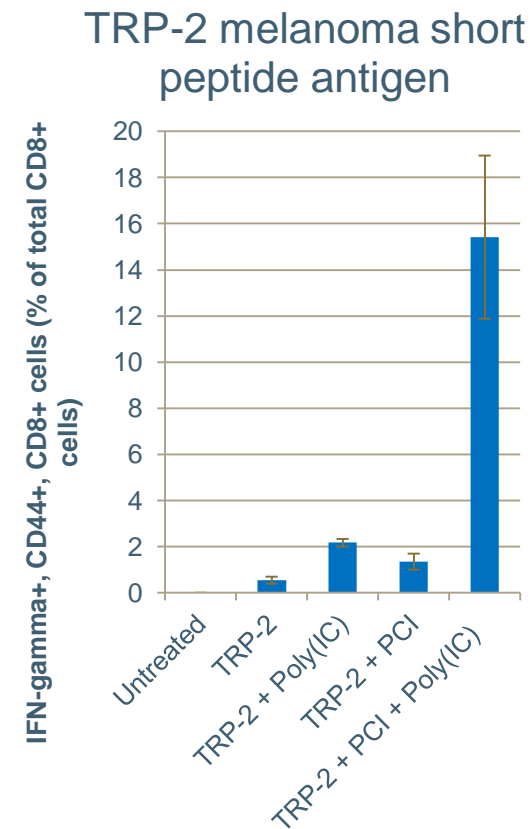
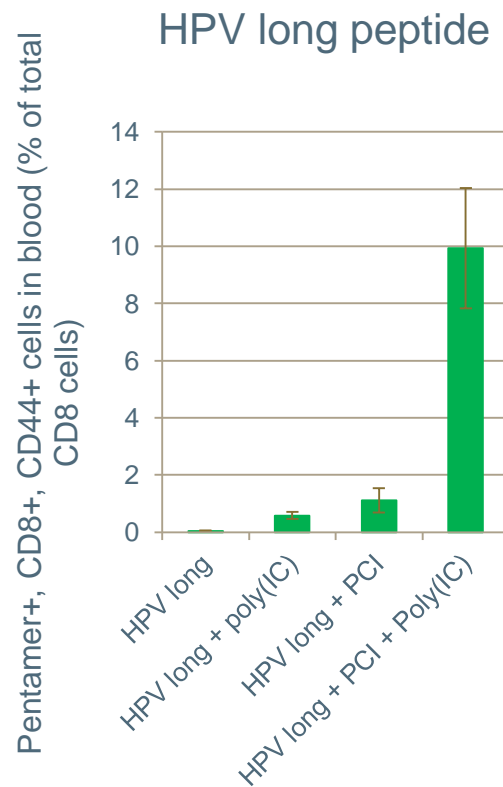


- Intradermal vaccination at days 6 and 13 after tumour cell inoculation
- 5 animals per group

# SYNERGY WITH OTHER TECHNOLOGIES

## ► Acts synergistically with other vaccination enhancement technologies

- Acts synergistically with several commonly used vaccine adjuvants
- Works with many different peptide antigens and stimulates both CTL proliferation and IFN- $\gamma$  production



# THERAPEUTIC VACCINATION WITH **fima VACC**

- ▶ Opportunity to play a key role in second generation immunotherapy
- 



- ▶ Unique mode of action
  - indication of CTL-induction by MHC class I antigen presentation in dendritic cells and macrophages
- ▶ Broad applicability
  - peptide and protein antigens
  - particulate antigen formulations
  - prophylactic & therapeutic vaccination
- ▶ Safety of fimaporfin confirmed in Phase I studies
- ▶ Excellent stability
  - stable at room temperature
  - stable in solution
  - can be autoclaved
- ▶ Cost effective synthesis

# NUCLEIC ACID THERAPEUTICS

- ▶ A treatment modality with huge potential
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Estimated sales of  
**USD 18bn**  
in 2030  
(RNAi alone)

mRNA is a hot  
new field with  
**HIGH DEAL  
ACTIVITY**

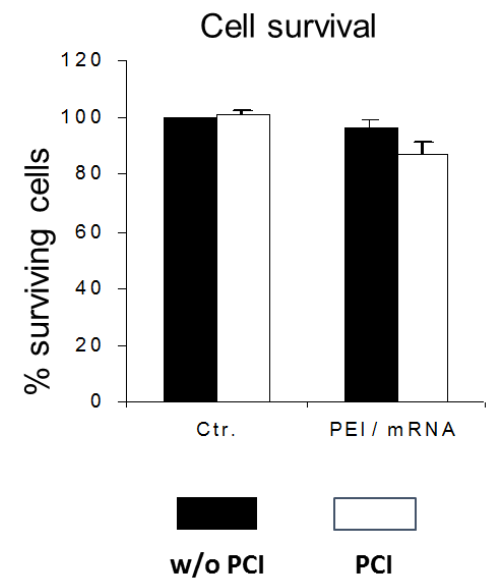
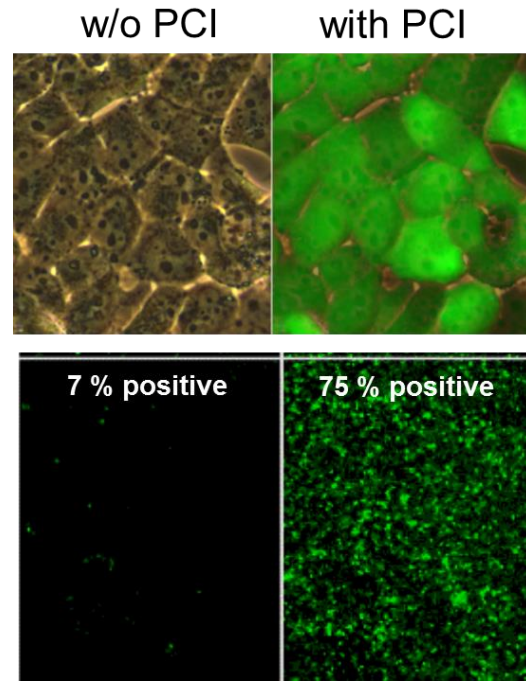
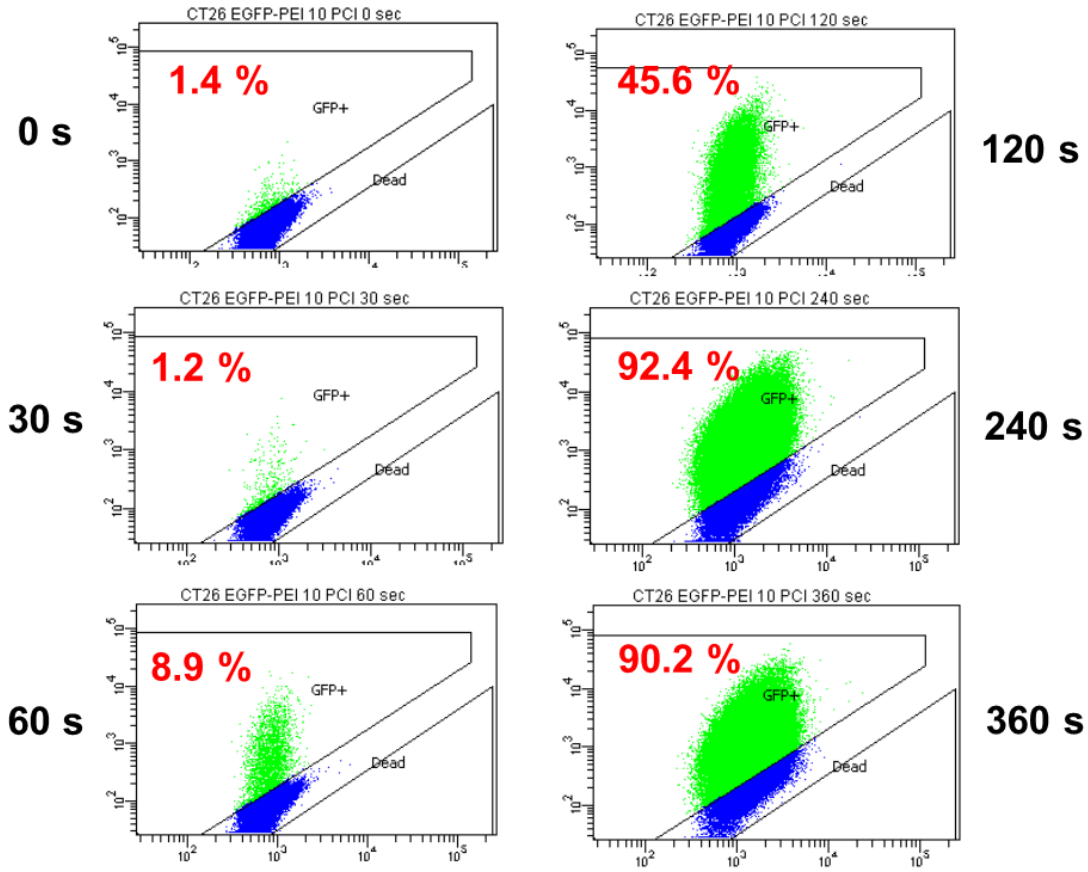
Main  
**HURDLE IS  
DELIVERY**  
into cells

- ▶ **fimaNAC** may provide a delivery solution for many nucleic acid therapy applications
- ▶ Opportunistic collaborative approach

# ENHANCING MRNA DELIVERY

► Strongly increased GFP synthesis with increasing light doses

fimaNAC with polyethylenimine vehicle



# KEY MILESTONES THROUGH 2018

► Unlocking the true potential of innovative medicine

