



Messenger RNA as a Target and a Therapeutic

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President, Onkaido Therapeutics

Onkaido: wholly-owned Venture of Moderna Therapeutics

Ventures

onkaido

24 employees
oncology focus

valera

infectious disease

elpidera

a moderna venture
rare genetic diseases

caperna

a moderna venture
cancer vaccines

moderna

messenger therapeutics

360+ employees
Platform focus

Internal Research
and Development

Partners

AstraZeneca 

ALEXION

 MERCK

Why mRNA for cancer?

Potential advantages over conventional therapeutics

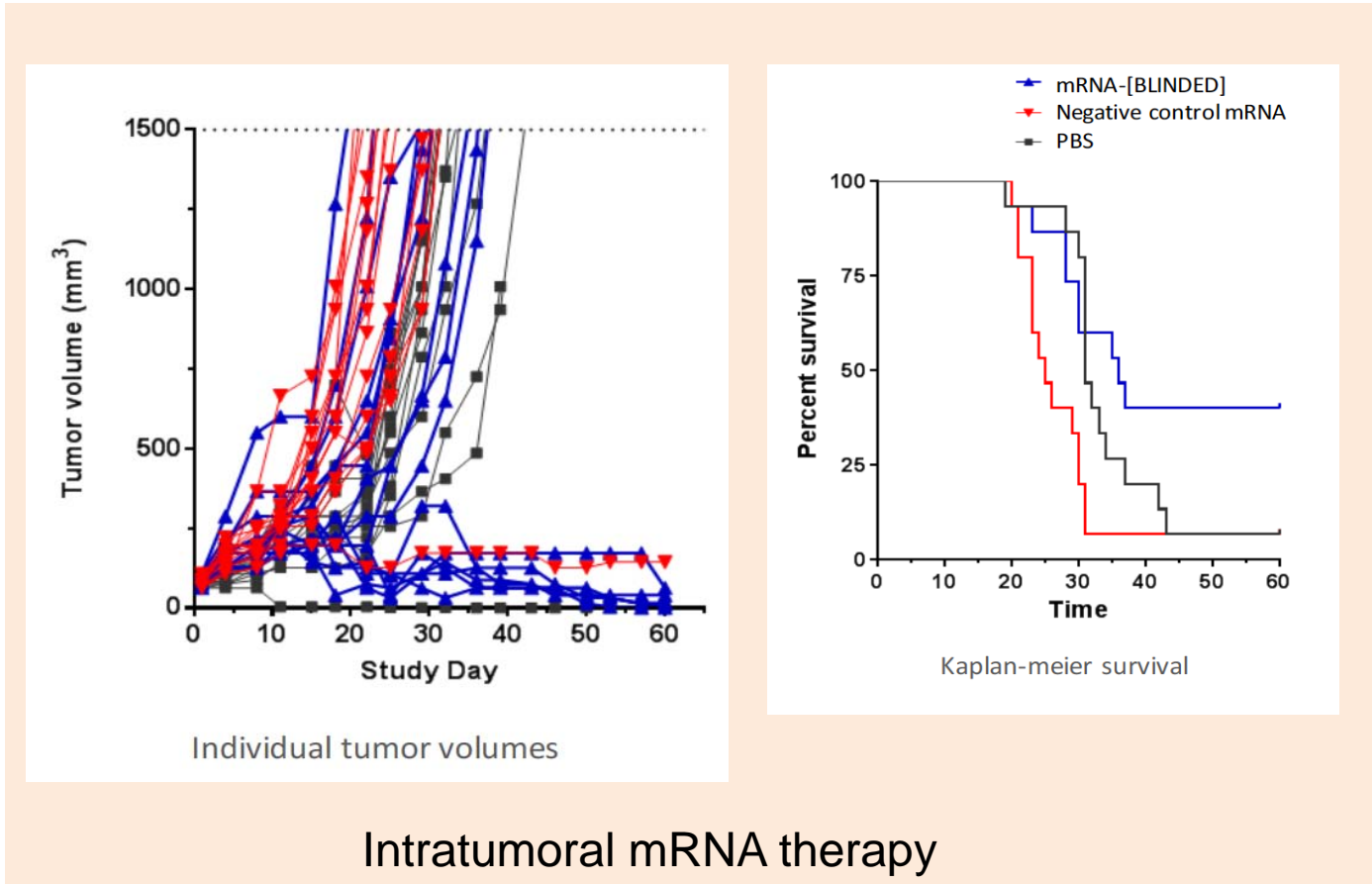
- 'Undruggable' targets with intra-cellular proteins
- Induction of unwanted peptides or proteins
- Induction of transmembrane proteins
- Repletion of missing proteins

- Easily enabled combinations
- Rapid research turnaround time

Potential advantages over gene therapy

- Transient, regulatable effect
- Does not need to enter the nucleus
- No risk of genomic integration

Tumor Immunotherapy as mRNA



Key Challenges and Opportunities

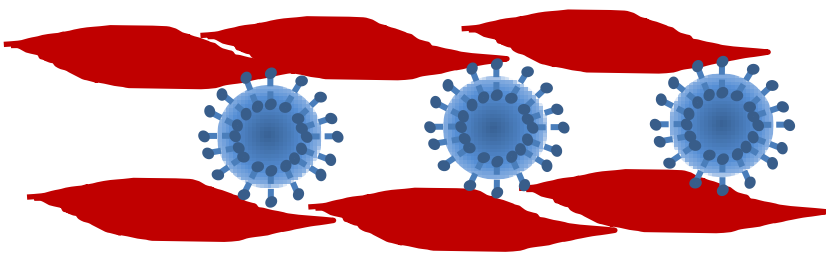
**Tumor
delivery**

**Poor
predictability
of in vitro
systems**

**Complex
chemistry
of mRNA**

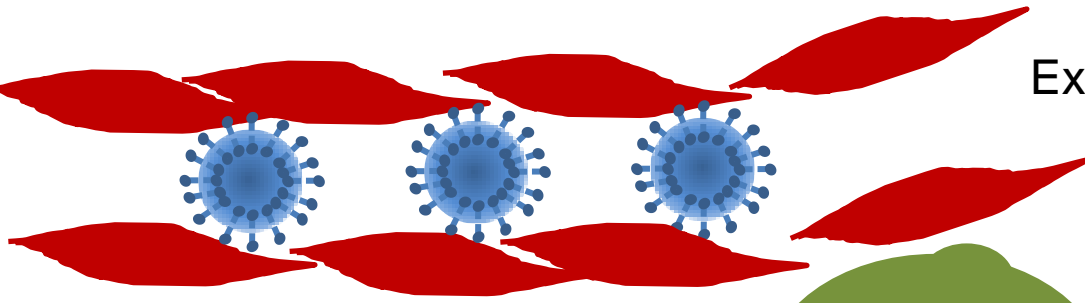
**Complex
PK model**

1



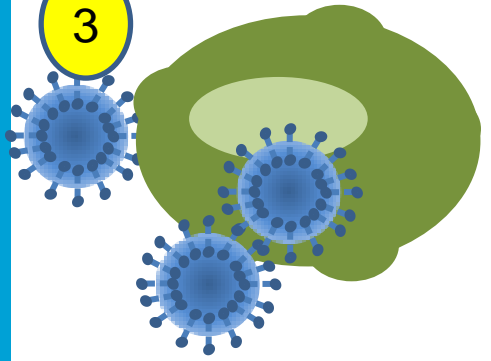
Circulation of LNPs within vasculature

2

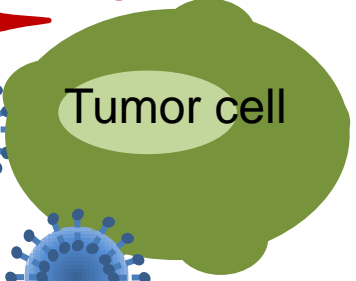


Extravascular space

3

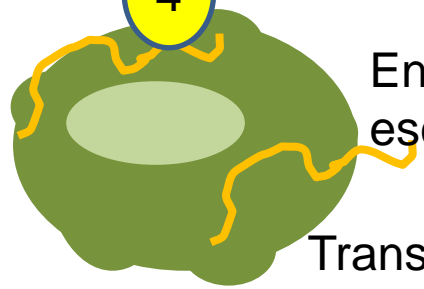


LNP uptake



Tumor cell

4



mRNA degradation

Endosomal escape

Translation efficiency

5

Protein kinetics

