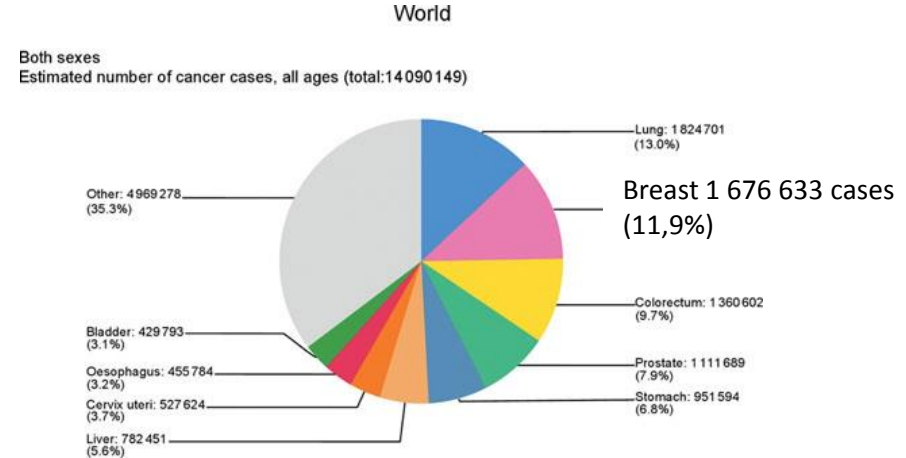
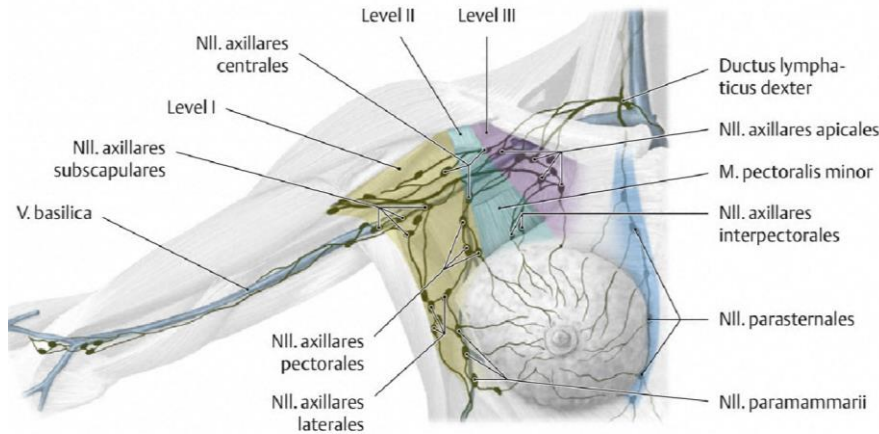




ProNaCell

Protein Nanoparticle based Drug Delivery Platform
for Highly Specific and Protected Transport into Target Cells





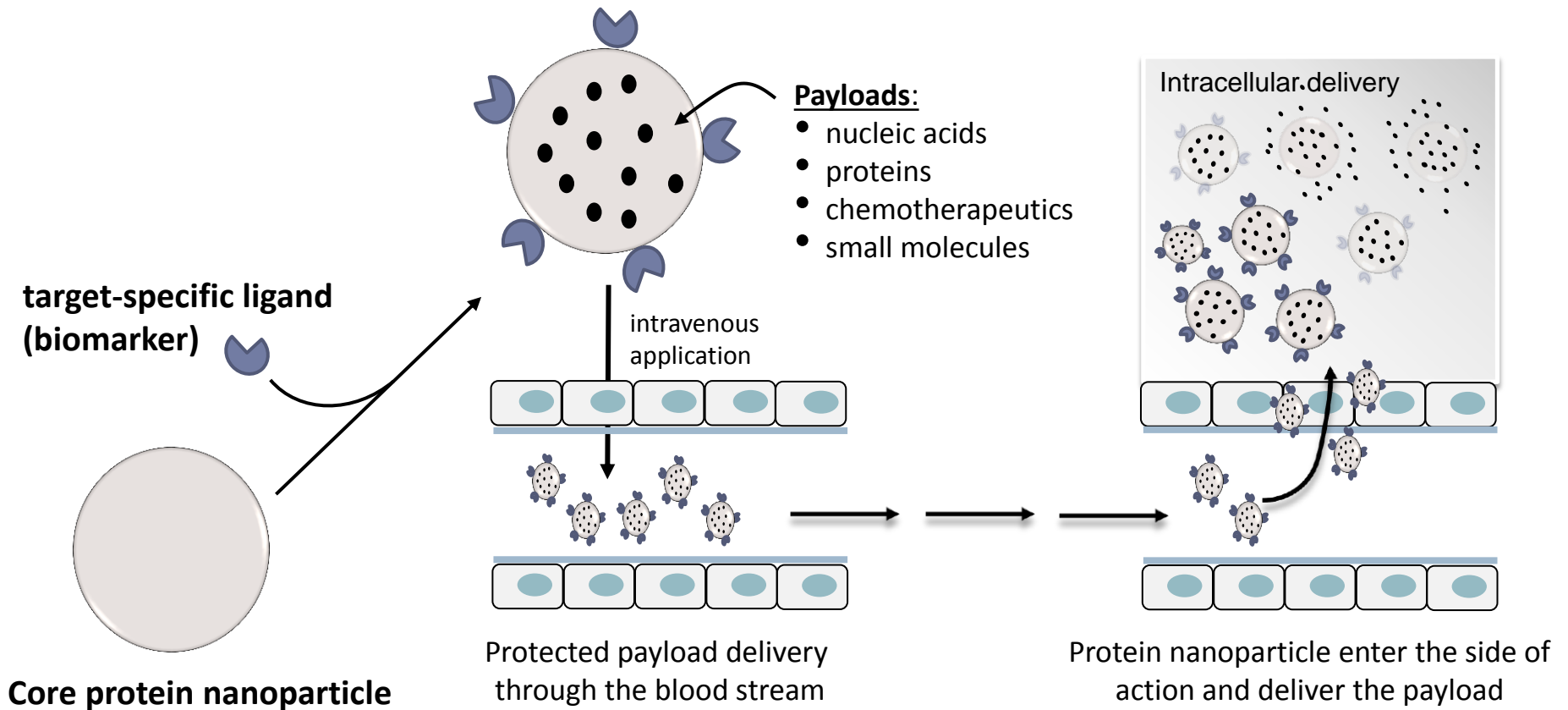
- Incidence: 1.7 million estimated new cases in 2012
- Therapy: surgery, chemotherapy, radiotherapy
- Targeted therapy: Trastuzumab (Herceptin 7.3 bn\$ Roche 2014)

PDL Biopharma (www.pdl.com); Celgene Reports 2014

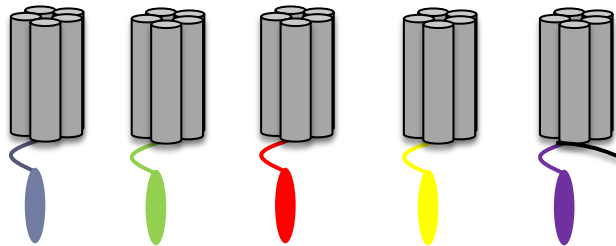
- Mortality: 522 000 estimated death (30.5%)

WHO World Cancer Report 2014

Engineered protein nanoparticle - EPN

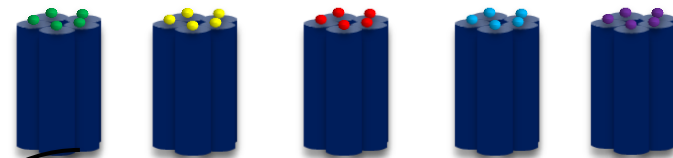


Production of a set of pentamers modified for optimized drug encapsulation



payload dependent anchor sequence

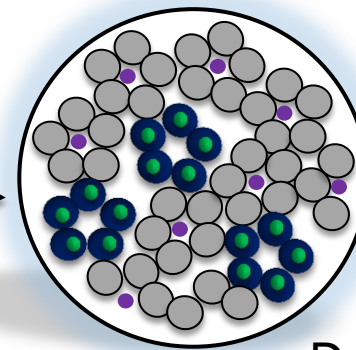
Production of a set of pentamers modified for optimized targeted transport



biomarker targeted VP1 pentamers

Possible Payloads:

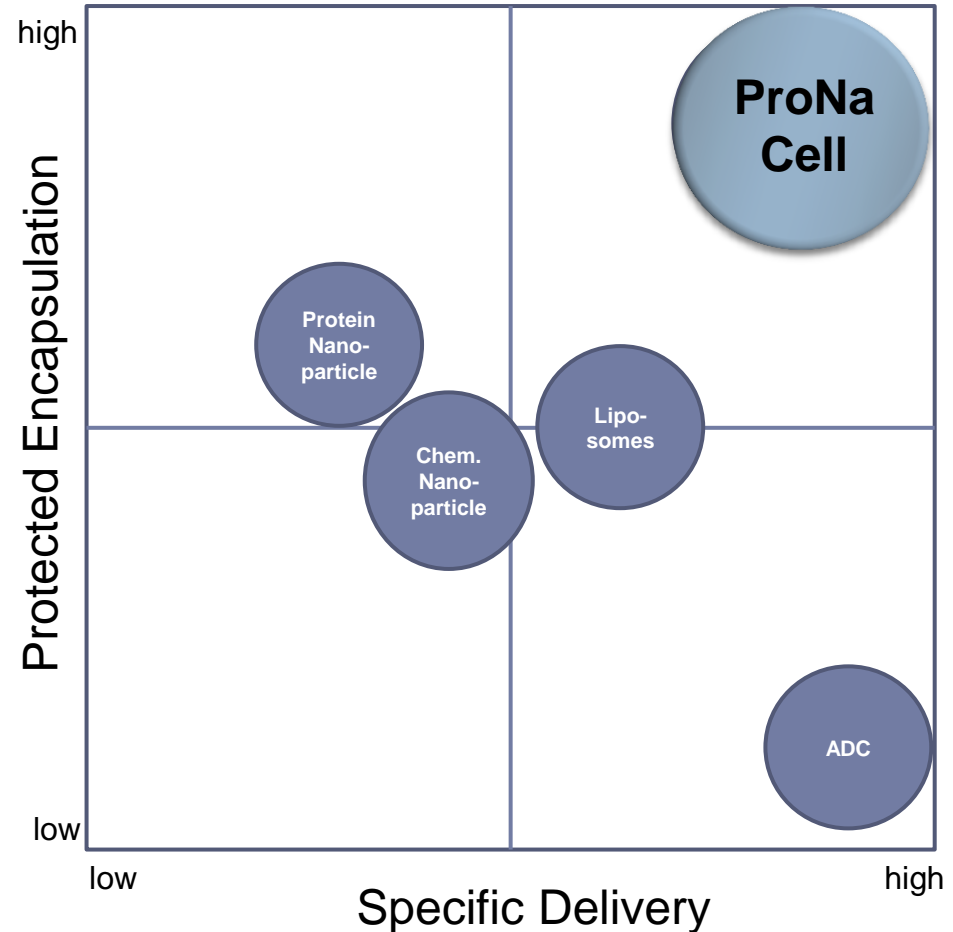
- DNA
- RNA
- siRNA
- Chemotherapeutics
- Small molecules



Drug loaded modified
Engineered Protein Nanoparticle

The ProNaCell proprietary transport system with modified EPN uniquely enables cell-type-targeted and shielded transport of active compounds with optimized intracellular release of drugs...

- ▶ ...at high level of biocompatibility
- ▶ ...nearly zero immunotoxicity
- ▶ ...for huge amount compound classes
- ▶ ...at highest stability
- ▶ and strong protection
- ▶ ...at excellent availability





Immuntox study in mice

“Core nanoparticle induced only minimal immunological response in mice” (VLP-project/LSI)



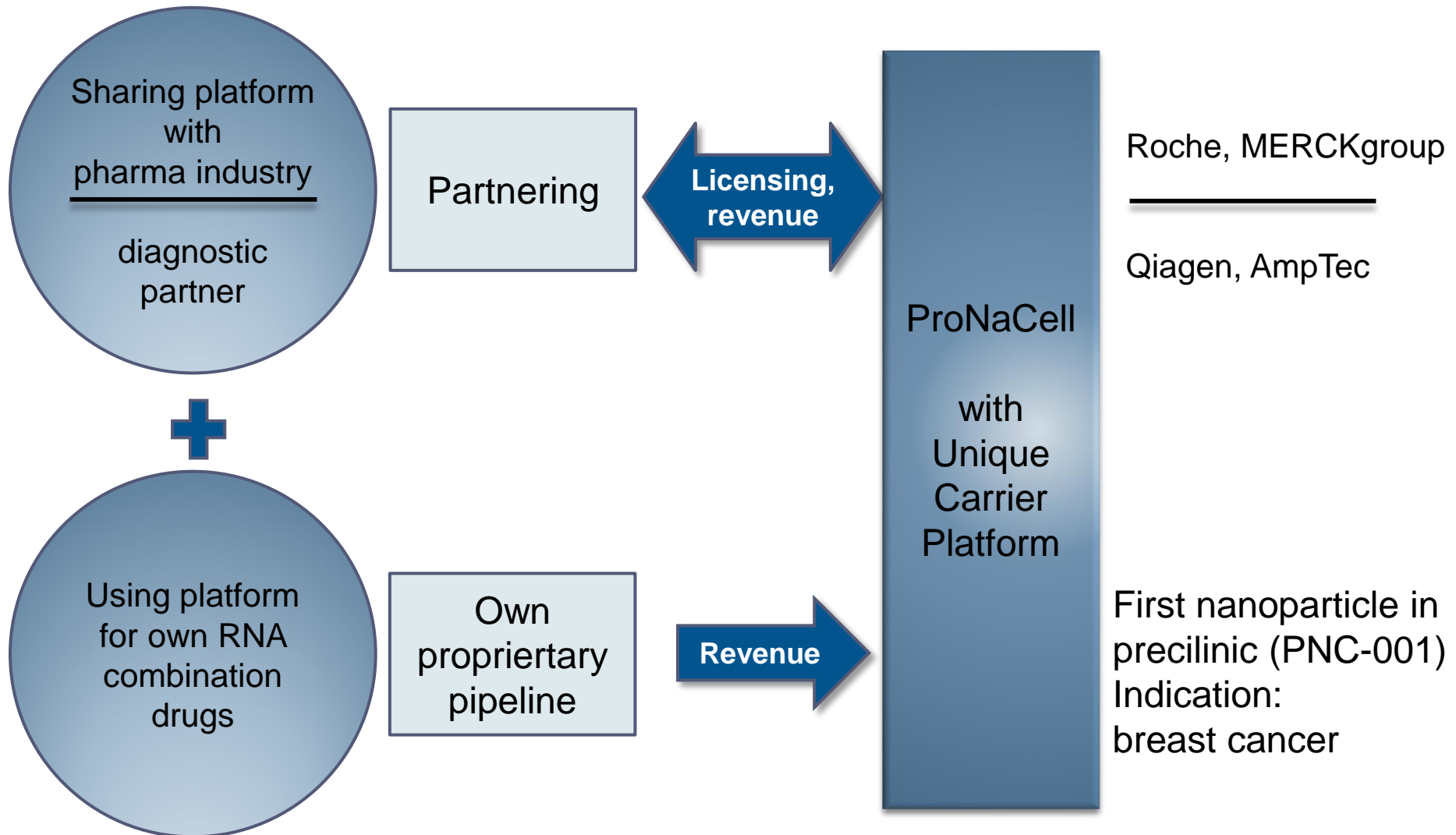
Breast cancer orthotopic tumor model in mice

“Specific uptake of EPN in tumor tissue was confirmed by FACS analysis with no uptake of EPN in cellular microenvironment of the tumor.”
„No adverse effects were seen in mice after injection of EPN”



Clinical relevant human breast cancer spheroid model

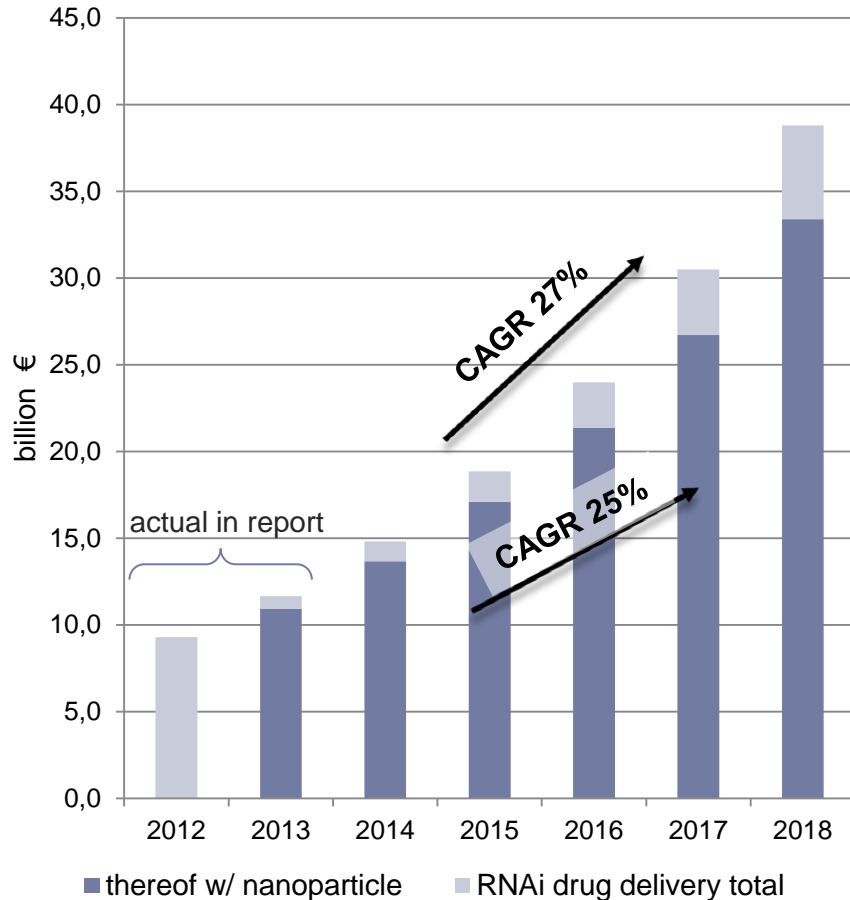
“Bio-distribution of the EPN samples tested is 24-fold faster in comparison to chemotherapeutics and liposomes as comparable drug delivery systems.”



Investment	BMBF/LSI 1.3 mEUR		First round 2,5 mEUR	Second round 18 mEUR
	2012 Q3 – 2015	2016 Q2	2016 Q3 – 2018 Q2	2018 Q3 – 23 Q2
Research & Development	[Green bar]			
Platform tuning:			[Hatched bar]	[Hatched bar]
➤ Breast cancer		[Green bar]	[Green bar]	
➤ CF			[Orange bar]	
➤ AATD			[Brown bar]	[Brown bar]
➤ NSCLC			[Blue bar]	
➤ AML			[Dark blue bar]	[Dark blue bar]
Industry Cooperations			[Red bar]	[Red bar]
Preclinical development			[Yellow bar]	[Yellow bar]
Phase I study				[Green bar]

- Required capital for first preclinical studies in breast cancer and to optimize the platform for additional indications (own pipeline) will be 2,5 mEUR
 - ▶ 0.5 Mil. EUR are committed by the LSI pre-seed fond
 - ▶ 0.75 Mil. EUR are expected from public investor
 - ▶ 1.25 Mil. EUR are subject to the actual private fund raising

Expected Development of Global Market for RNAi drug delivery



Source: RNAi Drug Delivery : Technologies and Global Markets
June 2014- BCC Research

RNAi Indications ProNaCell

Breast Cancer

- ▶ New patients pa: 1 500 000 (world wide)
- ▶ Expected sales potential pa: 1.0 bn € (market share 10%)

Non Small Cell Lung Cancer

- ▶ New patients pa: 400,000 (US and EU)
- ▶ Expected sales potential pa: 1.6 bn € (market share 10%)

Acute Myeloid Leukemia

- ▶ New patients pa: 30,000 (US and EU)
- ▶ Expected sales potential pa: 240 m € (market share 40%)

transferable to a large set of other oncologic diseases



Sales Potential of

+ 2.8 bn € p.a.

with two selected indications



Dr. Alexander Glassmann,
Co-Founder, CSO
skills: tumor biology, human anatomy



Dr. Sebastian Franken, Co-founder
protein biochemistry, QA of proteins



Dr. Nadine Temme
Head of Discovery
Skills: virology, immunology



Dr. Michael Mehler Advisor
skills: corporate strategy



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life science **Inkubator**
catalyzing start-ups

