

# Lytix Biopharma

- Developing novel cancer immunotherapies

Investor Presentation, April 2017

# Lytix Biopharma in brief



## Company overview

- Private pharma R&D company, based in Oslo
- Founded in 2003, main focus on cancer immunotherapy since 2012
- Technology platform derived from research on host defense peptides – “nature’s own defense mechanisms”
- Strategy to develop projects through phase II, and partner for late stage development and commercialization

## Key investment highlights

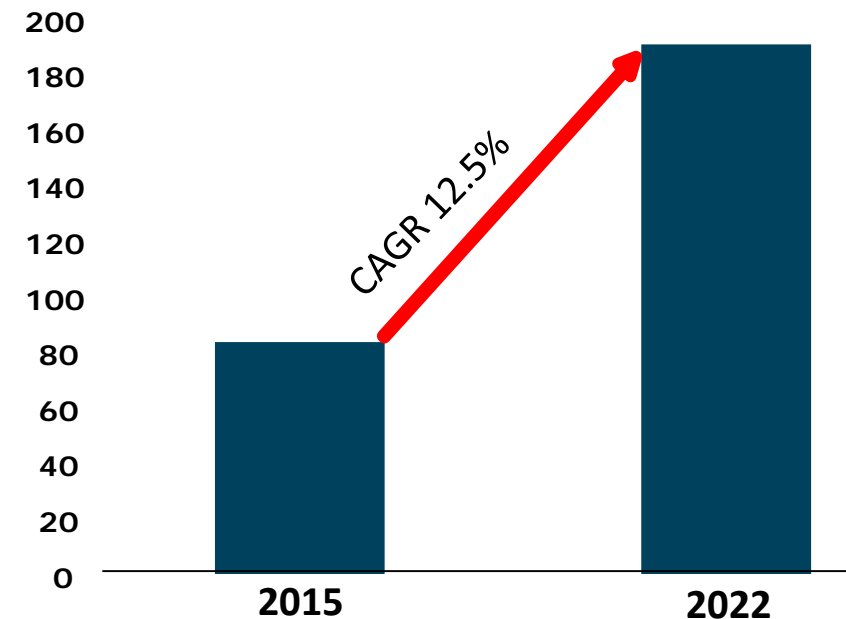
- 1 Positioned in the fastest growing segment in pharma with revenue potential estimated to USD 30bn
- 2 First-in-class oncolytic peptide that triggers powerful stimulus of immune cells
- 3 Mechanism of action stimulates broad T-cell repertoire that enables a multi-targeted attack on tumor
- 4 Clinical data from 42 patients, and with documented anti-tumor effects
- 5 Strong IP portfolio with granted patents lasting to 2032

# Medical need for cancer treatment is large and continues to grow

## Background

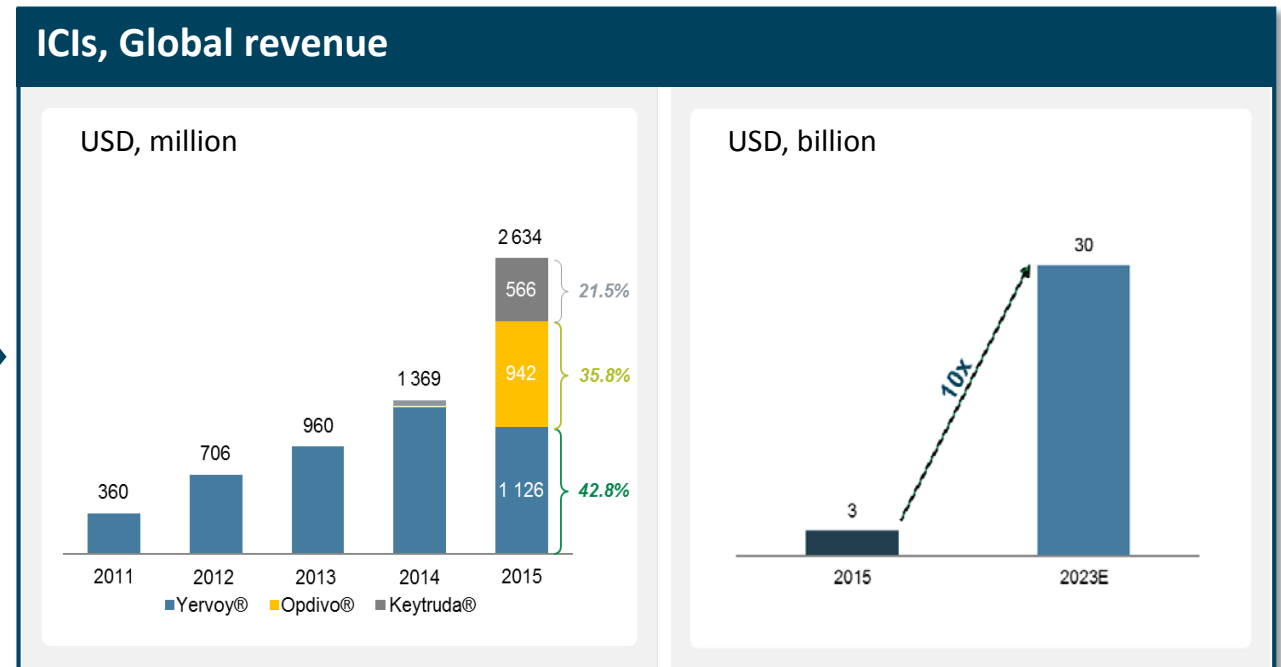
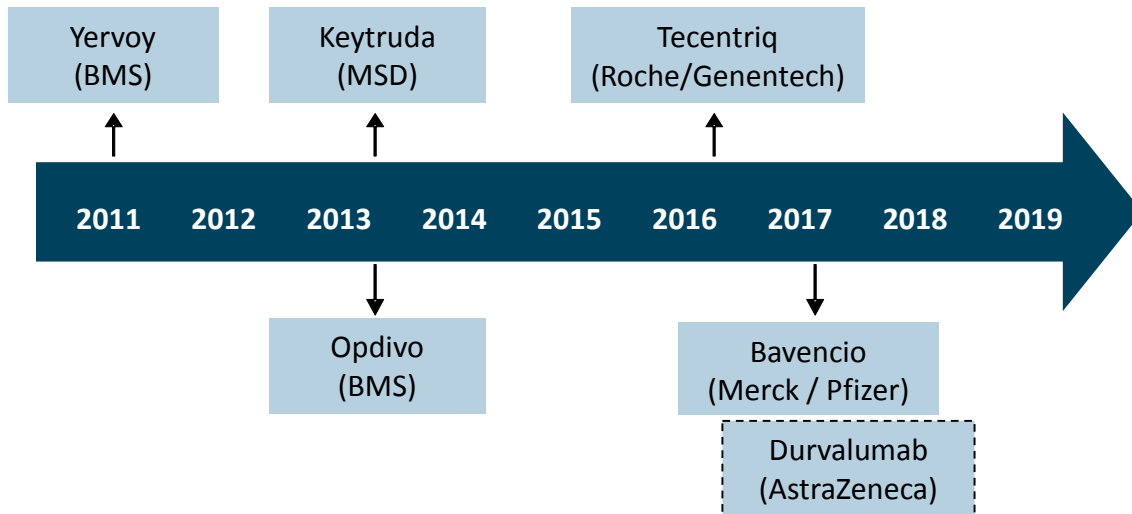
- Largest therapeutic area with 11% of total drug sales
- Cancer incidence is expected to grow as population gets older
  - Currently, 14 million people are diagnosed with cancer every year
- Large clinical need for better treatments, 8 million deaths every year
- Main pillars of therapy is surgery, radiotherapy, chemotherapy, targeted treatments
- Immunotherapy established as a new modality

## Revenue estimate cancer drugs 2015-2022, USD bn



# The first wave in cancer immunotherapy is the Immune Checkpoint Inhibitors (ICIs)

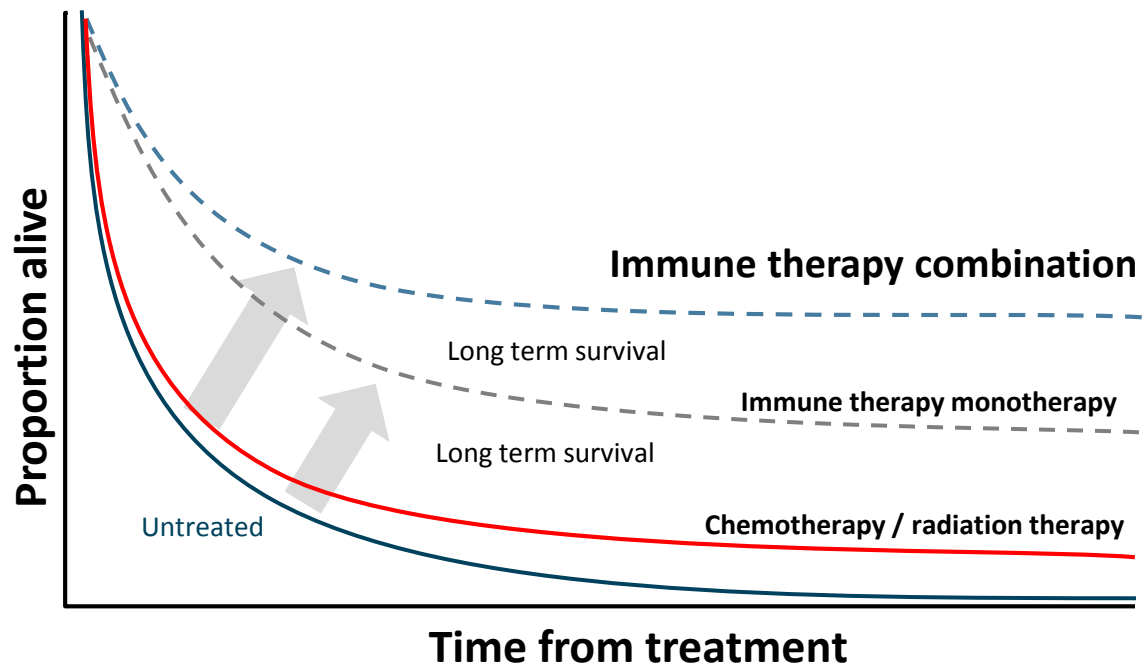
With ICIs, immune oncology has taken center stage in the pharmaceutical industry becoming an attractive oncology segment



# ICIs represent a paradigm shift in cancer treatment

## Next wave is to develop combination therapies

- Checkpoint Inhibitors have revolutionized cancer treatment today representing the new backbone of cancer treatment



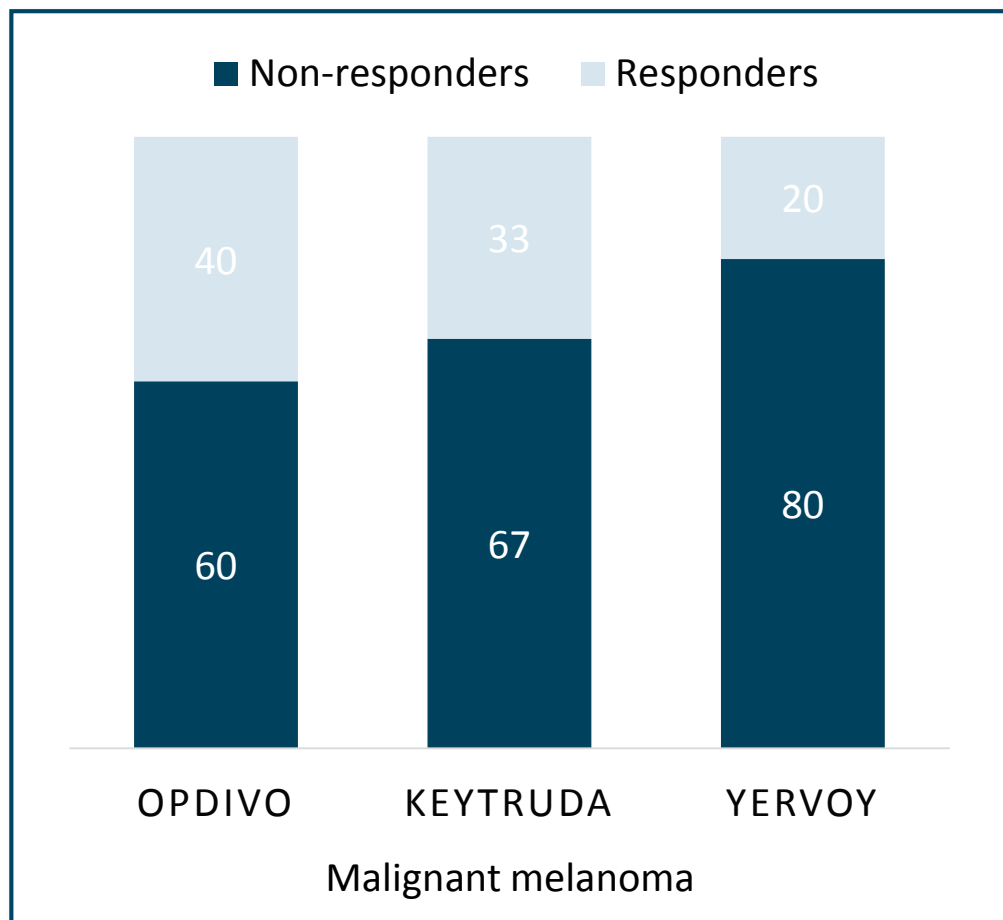
## ICIs: significant progress but no silver bullet

- Combinations of immunotherapies have shown significant higher response rate than monotherapy, however with high rate of serious adverse events

### Anti-CTLA4 and anti-PD1 clinical data in adv. melanoma

ICIs	Responders	Non-responders	Grade 3/4 AE's (side effects)
Yervoy	20%	80%	20-30%
Opdivo	40%	60%	10-20%
Keytruda	33%	67%	10%
Combination of Yervoy and Opdivo	58%	42%	55%

# The key challenge in immuno-oncology is low response rates



- Majority of cancer tumors are **cold** – no T-cell infiltration – and do not respond to immune checkpoint inhibitors
- **Hot** tumors have T-cell infiltration and may be effectively treated with immune therapy
- New drugs that can **convert cold tumors to hot** are highly needed

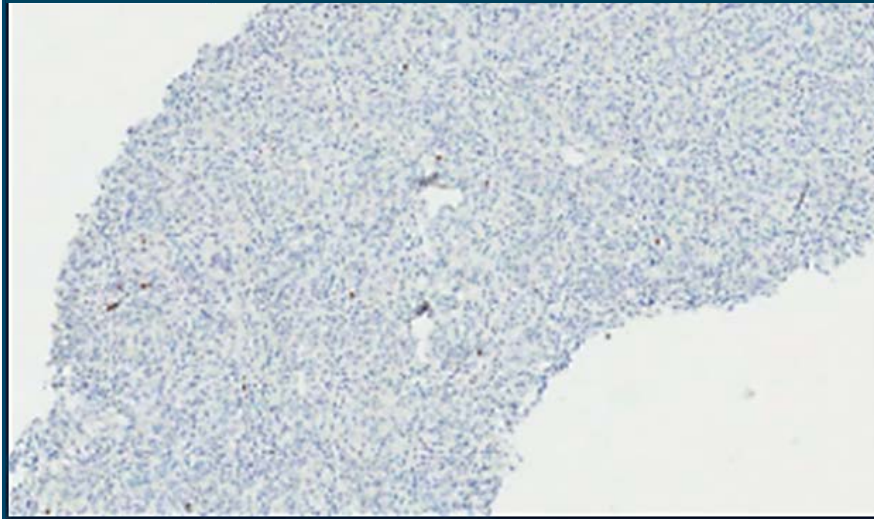


# LTX-315 is a first-in-class oncolytic peptide that turns “cold tumors hot”

Clinical trial with 28 patients:

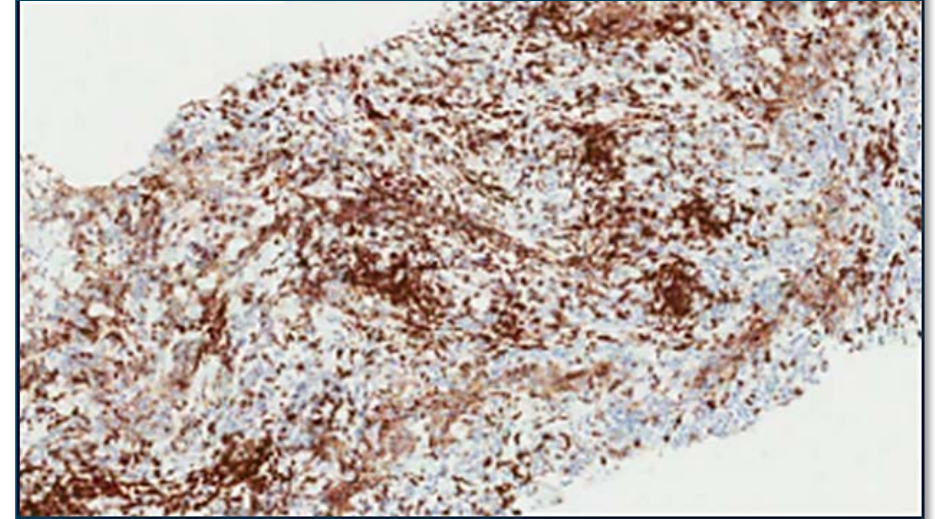
- Intra-tumoral treatment with LTX-315
- 74% of injected tumors turned hot<sup>1</sup>

**Cold tumor with no T-cells**



**Baseline**

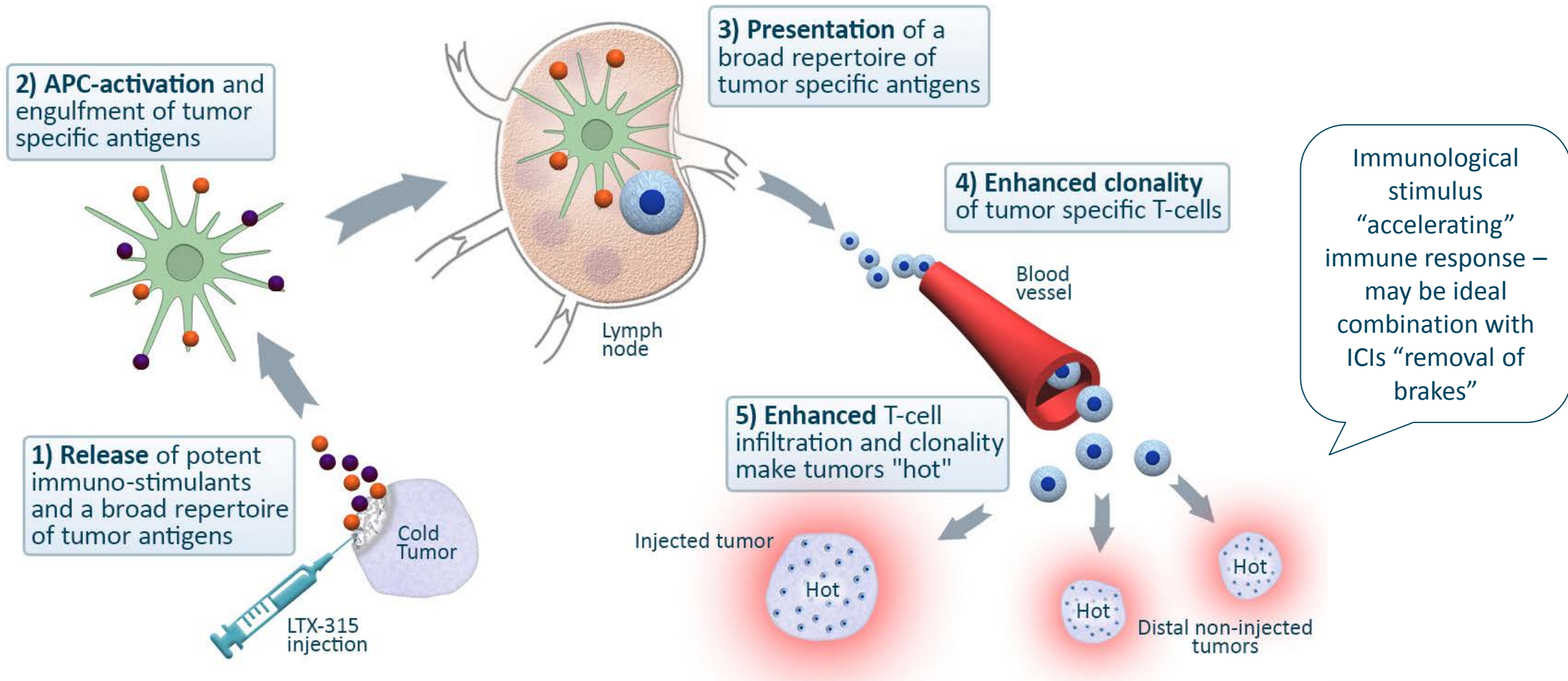
**Hot tumor with CD8+ T-cell infiltration**



**LTX-315 treated**

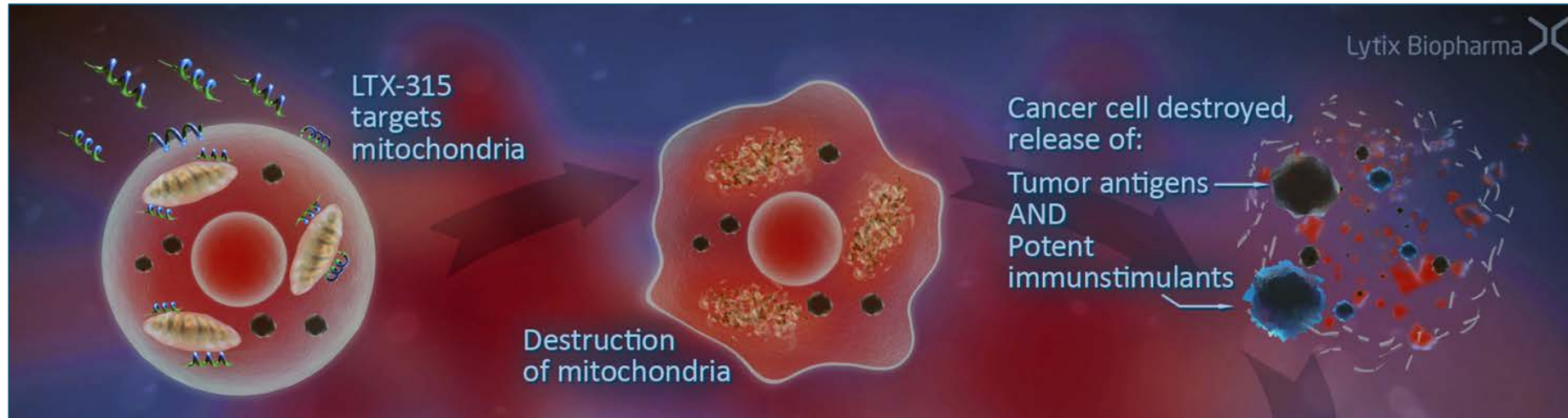
<sup>1</sup> 1 CD8+ T-cell infiltration in 14 of 19 evaluable lesions

# LTX-315's unique membranolytic activity results in a strong immunological response inducing «reshape and release» in tumor





# LTX-315 induces an effective release of tumor antigens and immunostimulants

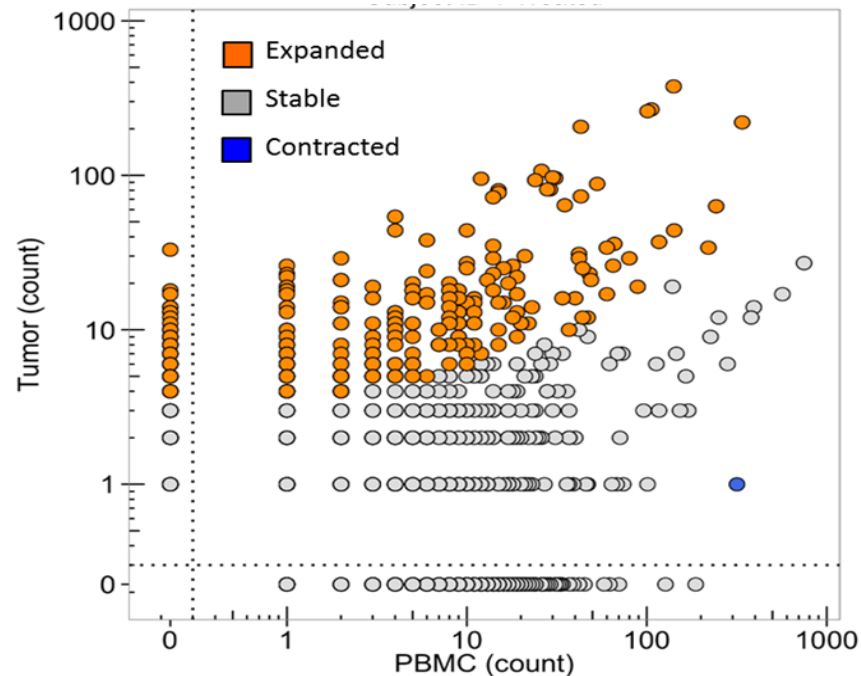


1. Induces immunogenic cell death of cancer cells
2. Disintegration of;
  - Mitochondria (high mutation rate and potent DAMPs)
  - Other cytoplasmic organelles

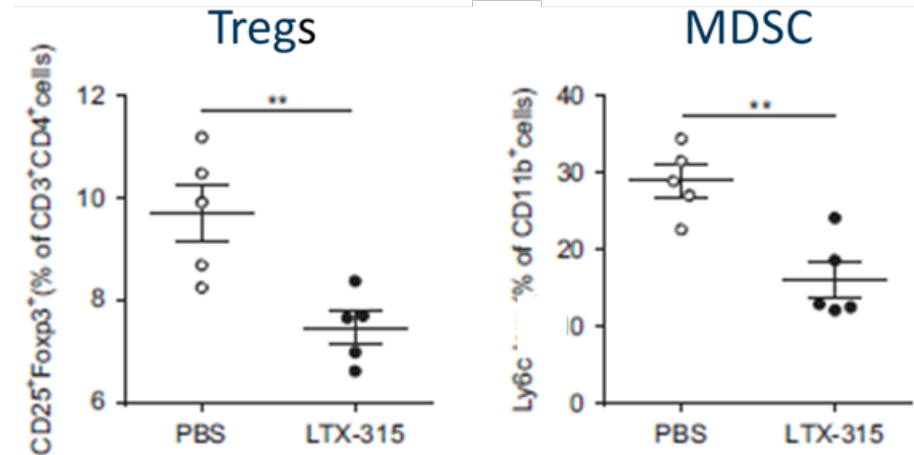
➡ Effective release of potent immunostimulants (DAMPs) and tumor antigens

# LTX-315 effectively increase T-cell clonality and reshapes the tumor microenvironment (Preclinical data)

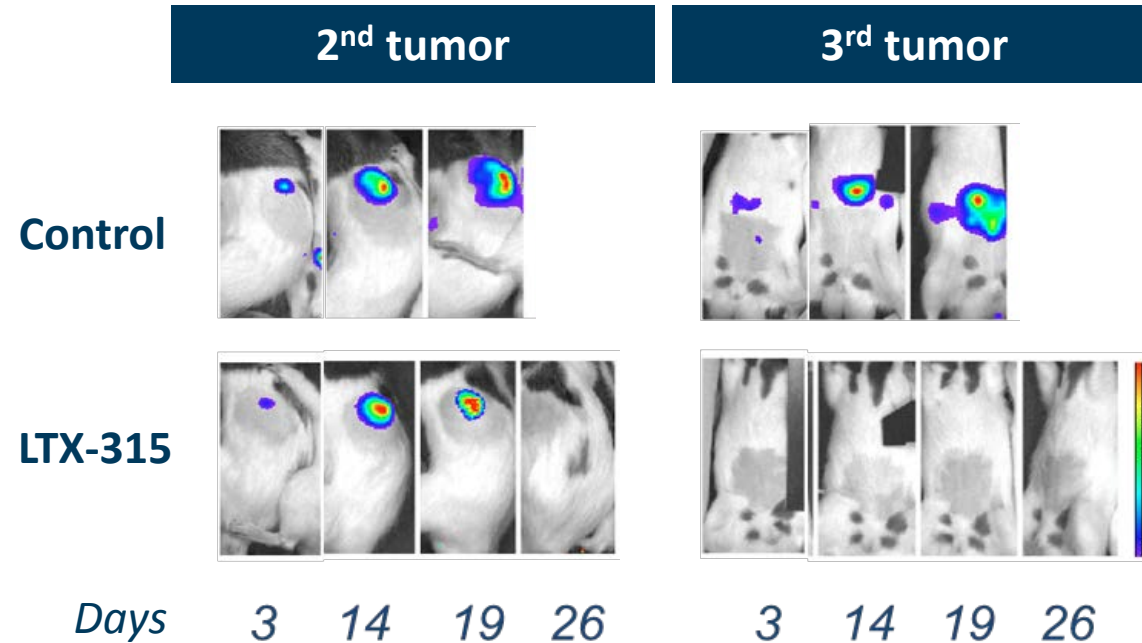
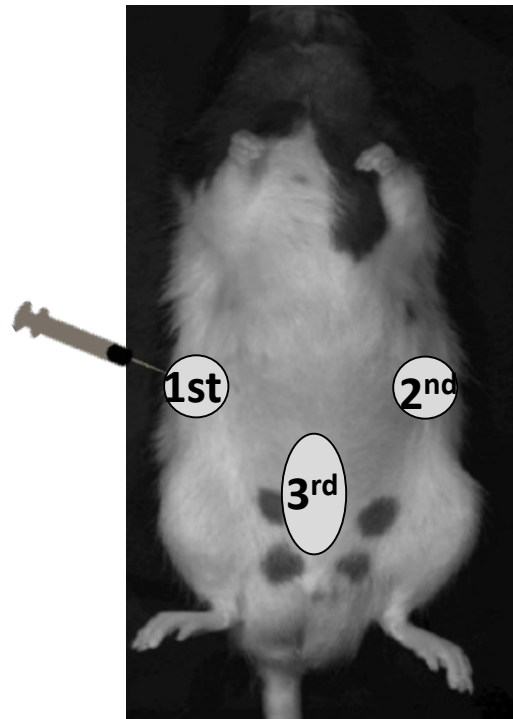
## Increased CD8+ T-cell in number and clonal diversity



## Reduced number of immunosuppressive cells – Tregs and MDSC



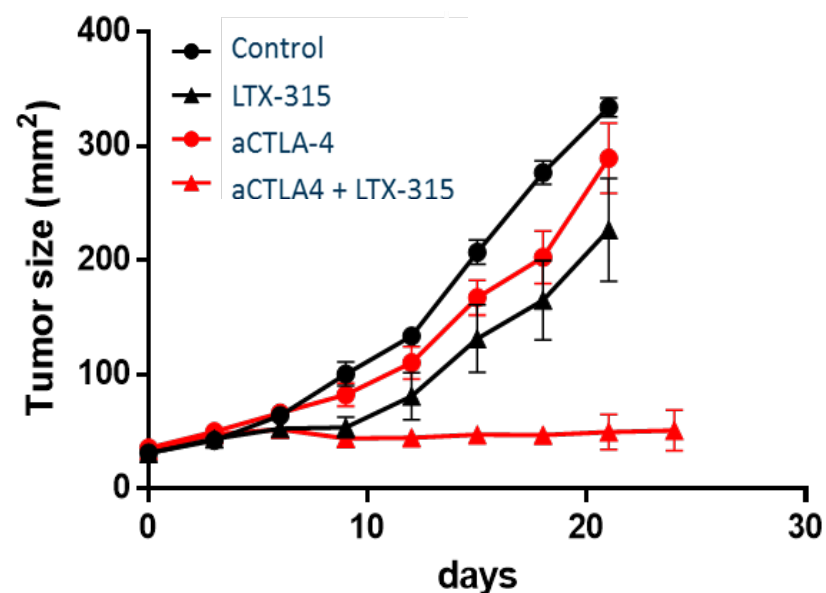
# LTX-315 induces complete regression in injected and non-injected lesions (preclinical data)



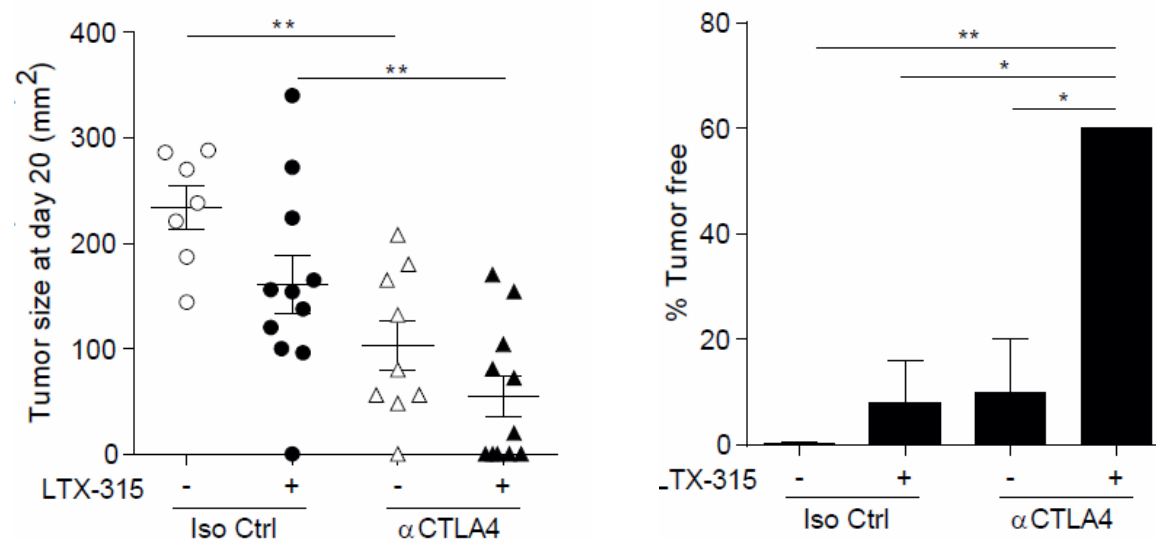
- The effect on distant tumors demonstrates an immediate systemic immune response
- Treated animals showed no tumor growth after being re-challenged up to 14 months later

# LTX-315 demonstrates synergy with immune checkpoint blockade in injected and non-injected tumors (preclinical data)

Injected tumors



Non-Injected tumors



# LTX-315 anti-tumor activity confirmed in patients

Ongoing open phase 1 trial:

- Mainly advanced cancer patients
- Various cancers with solid tumor
- Dose escalation, multi-lesion injections

Complete and partial regression of injected lesions

- 31% (8/26) of injected lesions (14 patients)

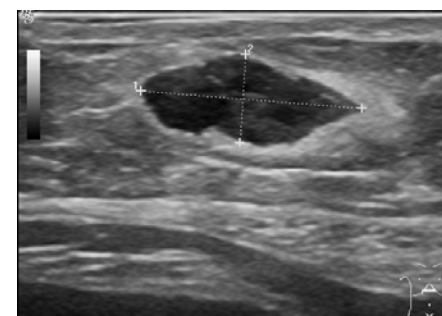
Stable disease (irRC response criteria)

- 50% (8/16) median duration of stable disease: 14 weeks

Significant infiltration of CD8<sup>+</sup> T-cells

- 74% (14/19) patients

## Melanoma patient (inj.lesion)

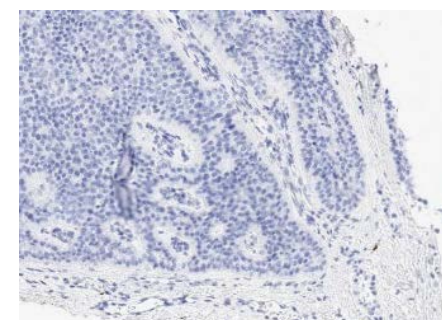


Baseline

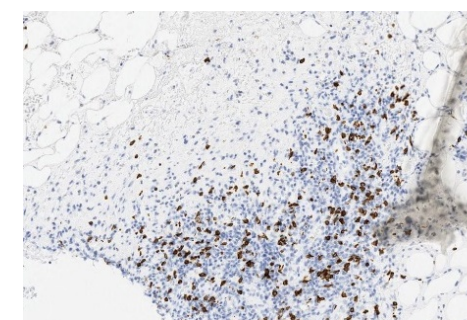


After treatment

## Myoepithelioma patient (inj. lesion)



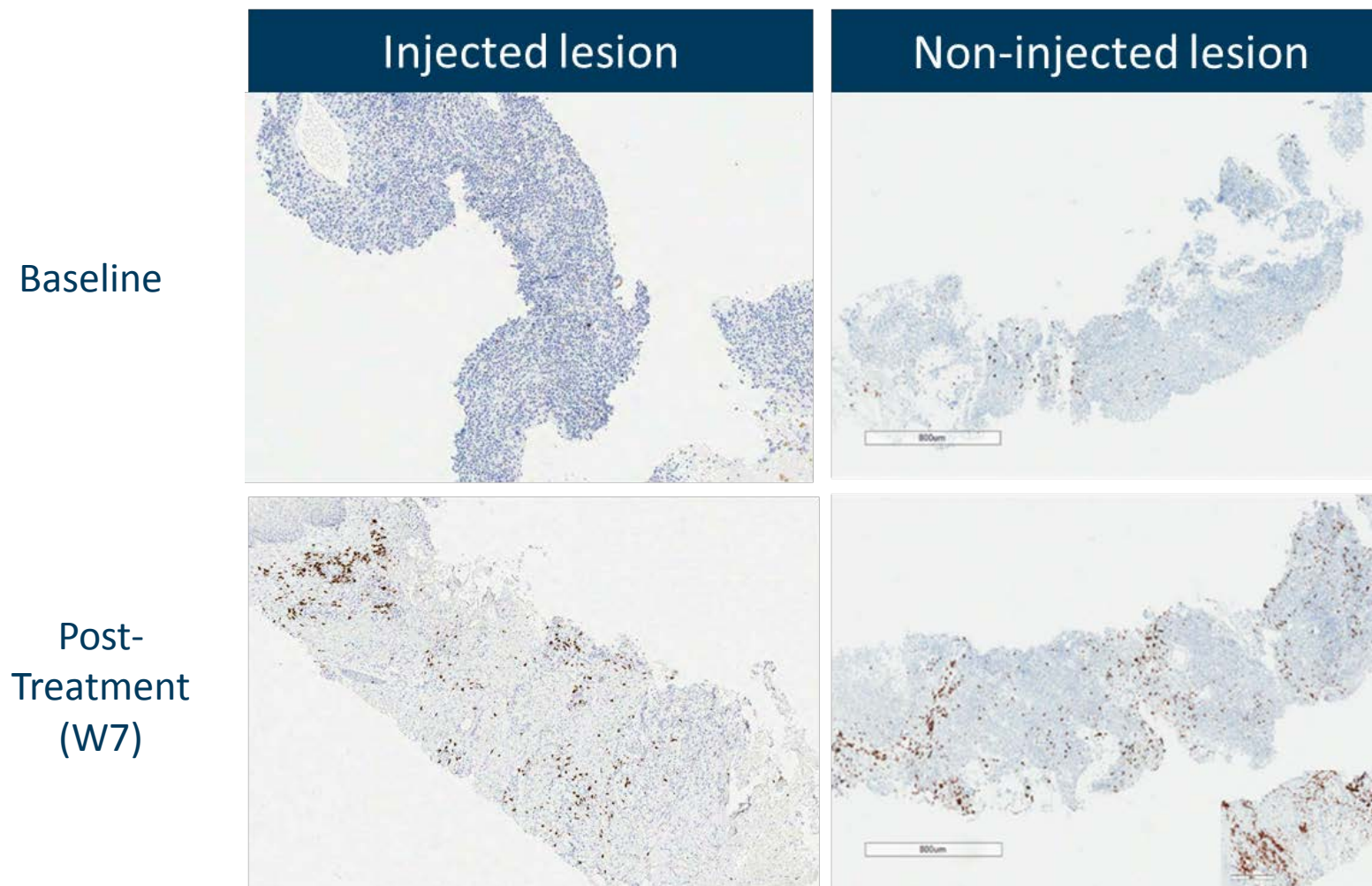
Baseline: Cold tumor



After treatment: Hot tumor

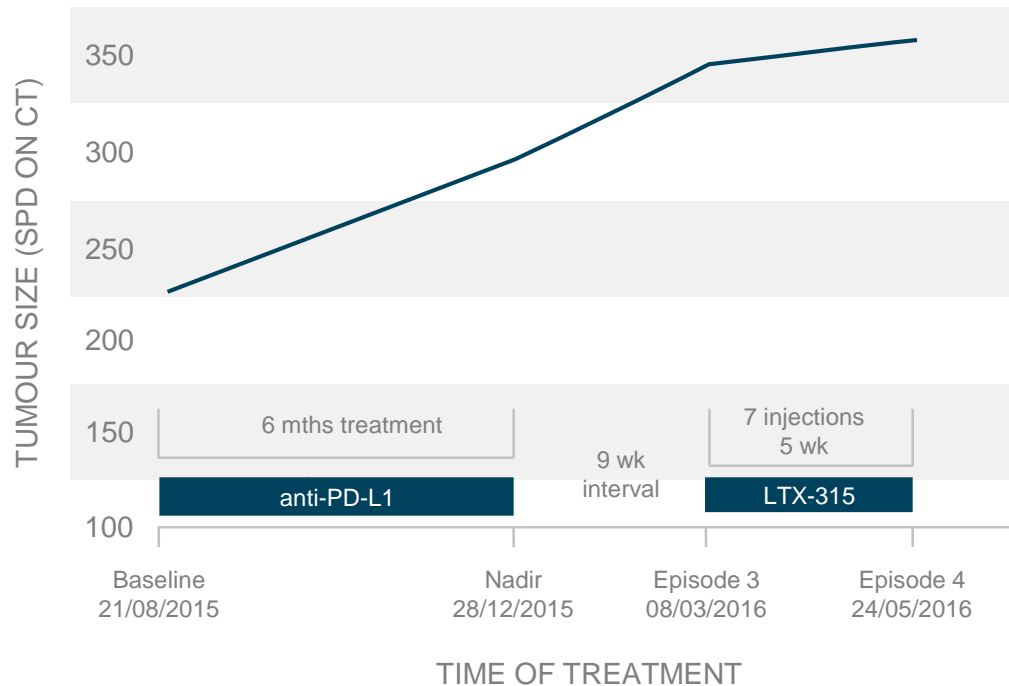


# Patient case report 1: Systemic immune response in malignant melanoma

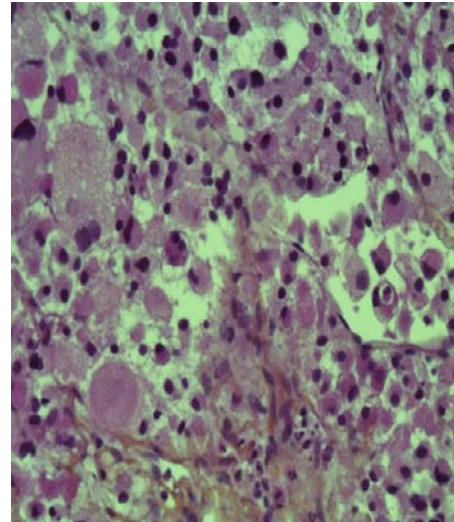


# Patient case report 2: Tumor regression documented in non-injected tumor

- 38 yr female, adrenocortical cancer, diagnosed in year 2000. Metastasis to lung, liver, peritoneum, bone.
- Multiple prior treatments: surgery (primary & met lesions), chemotherapy, radiotherapy
- anti-PDL1 treatment prior to LTX-315 treatment



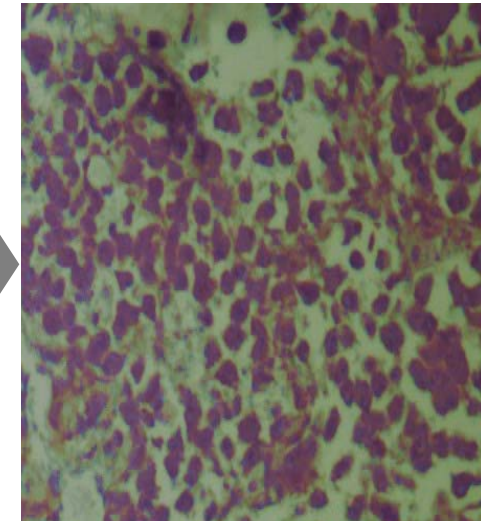
**Baseline biopsy:**  
Large flank lesion  
(non-injected)



Adrenal carcinoma

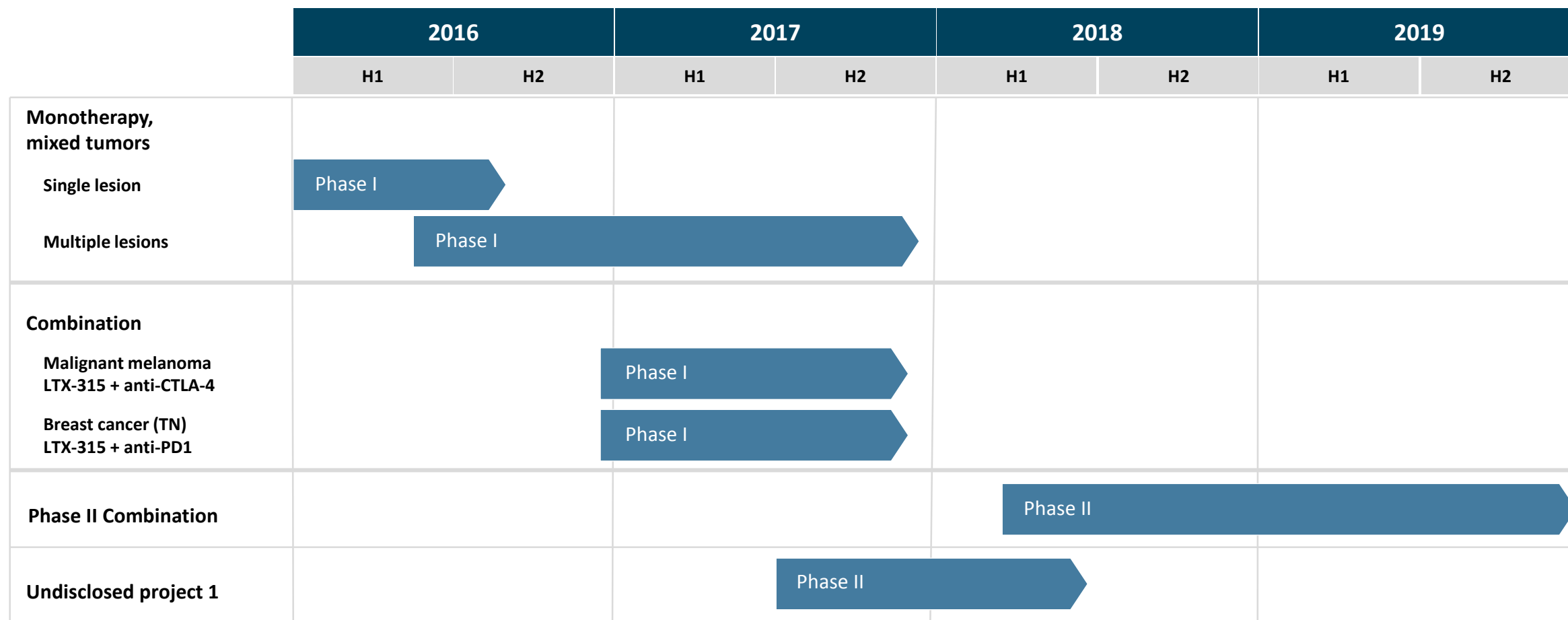
7 LTX-315  
injections

**Week 6 biopsy:**  
Large flank lesion  
(non-injected)



No viable tumor cells

# LTX-315 clinical development program



# Strong academic collaborations to further demonstrate LTX-315 anti-tumor effects



**HARVARD**  
UNIVERSITY

LTX-315 ability to reprogram tumors

*Prof M. Pittet*



LTX-315 ability to circumvent resistance to PD1-blockade using TLR agonists

*Profs Zitvogel & Kroemer*



**Oslo**  
University Hospital

LTX-315 in combination with immuno-chemotherapy

*Prof G. Mælandsmo*



**Cornell University**

LTX-315 in combination with irradiation

*Prof S. Demaria*

# Broad patent portfolio with protection until 2032

Product	Description	EU	US	JP	Other <sup>1</sup>
LTX-315 Monotherapy	Methods-of-use claims	Granted, expires 2019	3 granted, expires 2022	Granted expires 2019	AU, NO, CA
	Composition-of-matter claims	Pending, expires 2029	Granted, expires 2032	Granted, expires 2029	AU, BR, CA, CN, IN, NZ, KR, RU, SG
LTX-315 Combination	Methods-of-use claims	2 pending, expires 2034	2 pending, expires 2034	Pending, expires 2034	PCT (not selected)
T-cell clonality	Methods-of-use claims	NA	NA	NA	PCT filed February 2017
LTX-401	Composition-of-matter claims	Granted, expires 2030	Granted, expires 2030	Granted, expires 2030	AU, BR, CA, CN, IN, NZ, KR, RU, SG
Technology (adaptive immunity)	Methods-of-use claims	Pending, expires 2027	2 granted, expires 2029 and 2020		AU, CA, NO

<sup>1</sup> Additional countries where patent is granted or pending



# Management Team



**Håkan Wickholm, CEO**

- Extensive senior international leadership and management experience from AstraZeneca
- Experience from Commercial roles across various therapeutic areas including oncology and Strategic Business Development on both sell- and buy-side projects.



**Wenche Marie Olsen, COO**

- Extensive senior leadership experience within research, development and management of new drug products in pharmaceutical and biotech industry
- Former CEO of Laurus, various positions in Nycomed/GE Healthcare



**Andrew Saunders, CMO**

- Trained as a haematologist with 25 years experience in haematology drug development in both clinical practice and industry
- Extensive industry experience including large pharma (Roche, Eli Lilly), Biotech (Bioenvision) and founder and managing director of Linden Oncology Ltd, a specialist oncology consultancy.



**Torbjørn Furuseth, CFO**

- Broad experience from most aspects within life sciences sector
- Management consultant at McKinsey & Co serving clients within the Pharma and Health Care practice
- Medical Doctor with three years of practice



**Øystein Rekdal, Co-founder and CSO**

- Extensive research background within tumor immunology, oncolytic peptides and their abilities to induce potent tumor specific immune responses
- Leading collaborations with several distinguished international institutions, serves as a professor at the University in Tromsø.

# Board of Directors



**Gert W. Munthe - Chairman**

- Founder and Managing Partner of Herkules Capital - a leading Nordic private equity player. Chairman Pronova Biopharma 2004-2013.
- Extensive experience from both Norwegian and international business - former CEO of Alharma (listed on the NYSE), NetCom and Nycomed Imaging



**Kari Grønås**

- Extensive experience from pharmaceutical research and development in Norwegian pharmaceutical companies
- Former Senior Vice President Operations in Algeta
- Board member of BergenBio



**Knut Eidissen**

- Extensive experience as a board member from both private and public companies, and strong track record in creating shareholder value
- Owner and managing director of the consulting and investment company Picasso



**Lena Torlegård**

- 20 years experience as advisor on corporate communication, mainly dealing with financial, corporate and crisis communication
- Has worked with a number of Life Science companies, and is currently a member of the Board of Directors for Nanologica



**Debasish Roychowdhury**

- Recognized leader in the pharmaceutical industry with drug development experience from Lilly, GSK and Sanofi, where he was Head of Oncology Division
- President of Nirvan Consultants, serves in senior advisory roles for biotechnology companies, and has been involved in 9 drug approvals



**John Sigurd Svendsen**

- Extensive research experience, and professor of organic chemistry at the University of Tromsø
- Visiting scientist at several distinguished international institutions, including the lab of Professor K.B. Sharpless (Nobel Laureate, Chemistry, 2000) at MIT



**Morten Jurs**

- Extensive experience from the pharmaceutical sector as well as non-executive experience from several board positions from both public and private companies
- Partner in Pegasus Industrier AS, former CEO in Stamina Group AS and former CEO and CFO in Pronova BioPharma

# Advisory Board

## Clinical



**Robert Andtbacka, M.D.**

Associate professor in the Division of Surgical Oncology,  
University of Utah School of Medicine, U.S



**Sandra Demaria, M.D.**

Professor of pathology and radiation oncology,  
Weill Cornell Medical College, NY, U.S



**Kevin Harrington, M.D., PhD**

Professor in biological cancer therapies,  
The Institute of Cancer Research, London, UK



**Aurélien Marabelle, M.D., PhD**

Clinical director of cancer immunotherapy program,  
Gustave Roussy, France

## Scientific



**Guido Kroemer, M.D., PhD**

Professor of tumor cell biology, French Medical Research Council  
INSERM, Gustave Roussy, France



**Laurence Zitvogel, M.D., PhD**

Professor of clinical oncology and tumor immunology,  
INSERM, Gustave Roussy, France

# Lytix Biopharma Investment Case

## First-in-class product with clinical evidence

- Turning cold tumors hot
  - Ideal combination partner for ICIs
  - Stable disease documented in 50% of patients
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## Multiple value triggers

- Positioned in the attractive immuno-oncology market
  - Potential within multiple indications in solid tumors
  - Multiple shots on goal with clinical trials in several indications
  - Phase II combination trial expected to start Q1/Q2 2018
  - Selection of lead compound for deep-seated tumors during 2017
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## Strong team

- Management team and Board of Directors with international pharmaceutical drug development and commercial experience
- Highly recognized Clinical and Scientific advisory boards