

# Leronlimab (PRO 140)



## HIV - Cancer



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HIV

## PHASE 3 - Completed

World's first self-injectable for  
Unmet Medical Need Population

HIV

## PHASE 3 - Monotherapy

Several patients on  
monotherapy for > 4.5 years

GvHD

## PHASE 2 – Initiated

Unmet Medical Need

TNBC

## PHASE 1b/2 – Initiated

Unmet Medical Need

Colon Cancer

## PHASE 2

IND to be filed  
File for Orphan Drug Designation

Prognostic

## 510(k) for medical device

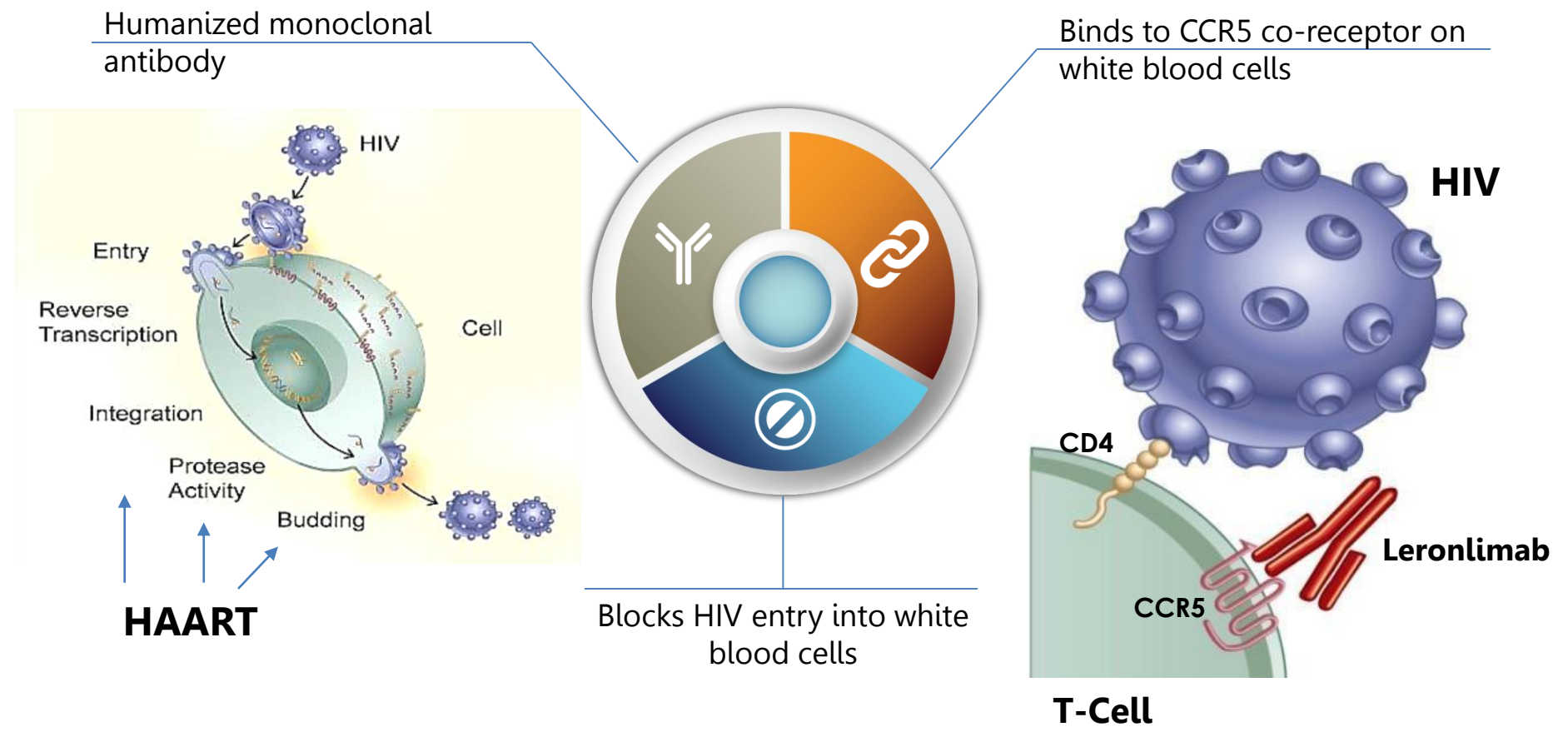
File with FDA for prostate  
cancer prognostic test

8 Cancer indications

## 8 Pre-clinical studies to be initiated

Melanoma, Pancreatic, Breast, Prostate, Colon, Lung, Liver and Stomach Cancer

Blocking **HIV** entry receptor (CCR5)  
Blocking CCR5/CCL5 interaction with leronlimab for use in **CANCER**



**FDA: “fast track designation” – “accelerated approval possible”**  
**NIH: \$28 million grants**

**Leronlimab**  
**(PRO 140)**



**HAART**

**No serious side effects and  
no drug related serious adverse events  
(SAEs) in >740 patients in 8 clinical trials**

**Side Effects**

**Ranges from mild to severe  
(Diarrhea, nausea, lethargy,  
depression)**

**Negligible toxicity in 740 patients**

**Toxicity**

**Problems with short- and  
long-term toxicity**

**No drug resistance in patients  
on monotherapy for over 4.5 years**

**Resistance**

**76% of HIV patients have  
at least one drug resistance**

**Weekly, easy, subcutaneous  
self administration**

**Compliance**

**Daily lifetime dosing with  
only 35% of patients with  
complete viral load suppression**

Pivotal Phase 3 Completed

Primary Efficacy End Point Hit -  **$p=0.0032$**

Safety of 24 weeks completed - With **81% of patients** with suppressed viral load as compared to **43%** last approved drug for this population

No reported SAEs related to leronlimab

BLA – submission green light from FDA

Rolling Review Submission Granted by FDA

1/3 of BLA already submitted in March 2019

**Potential label:**

**One drug resistance in three classes**

**or**

**One drug resistance in two classes with limited treatment option to another class**

- R5 patients w/suppressed viral load replacing HAART for leronlimab monotherapy
- **Leronlimab monotherapy – One dose (2 consecutive injections), once a week**
- High responder's rate – non-responders return to their original regimen without any resistance or harm – No ADA (Anti-Drug Antibody) presence – No X4 grow out during the monotherapy

- **Increasing response rate** (Suppressed viral load without pills)

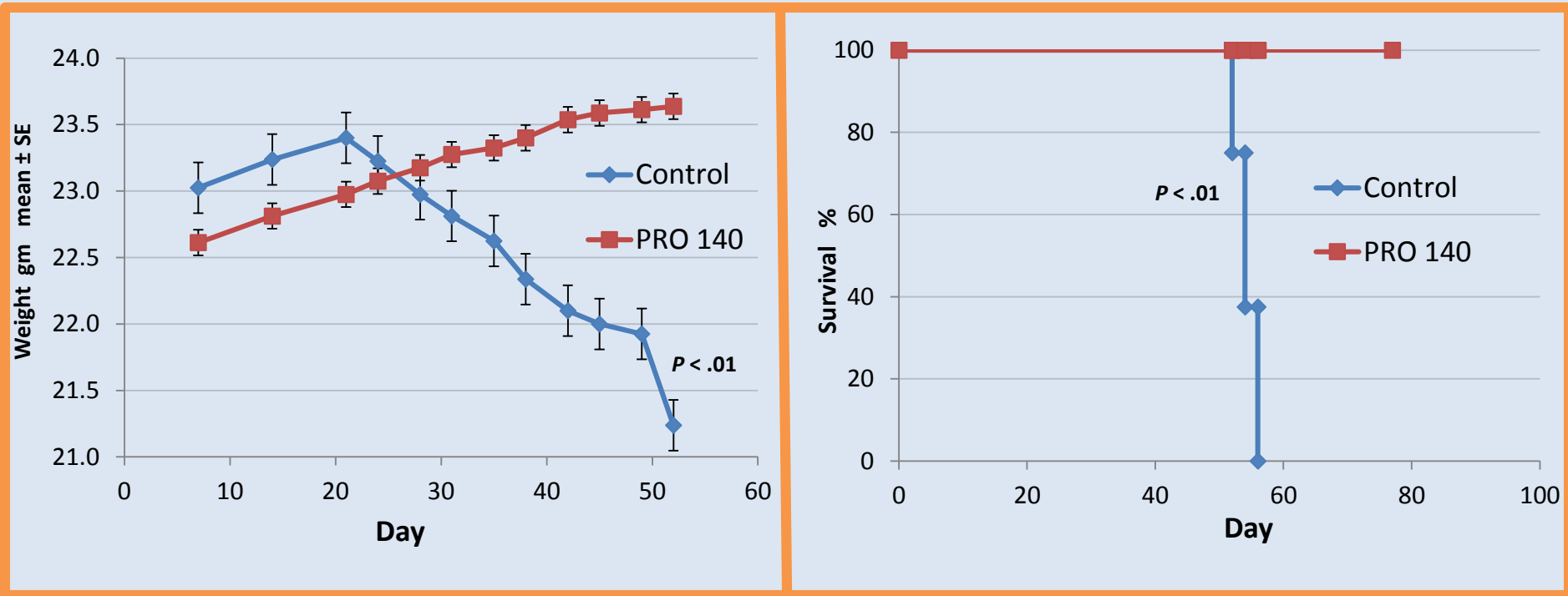
Dose	Average duration post 10 weeks	Responder's rate post 10 weeks
525 mg	26 weeks	95%
700 mg	9 weeks	91%

- Regulatory path
  - **Submit pivotal trial to the FDA 2Q2019**

# Effect of Leronlimab (PRO 140) on Xeno GvHD-Human BM Transplanted Into Immuno-Deficient Mice

## Results Published

**TRIAL TO RE-INITIATE WITH MODIFIED DOSE/PROTOCOL IN MAY 2019**



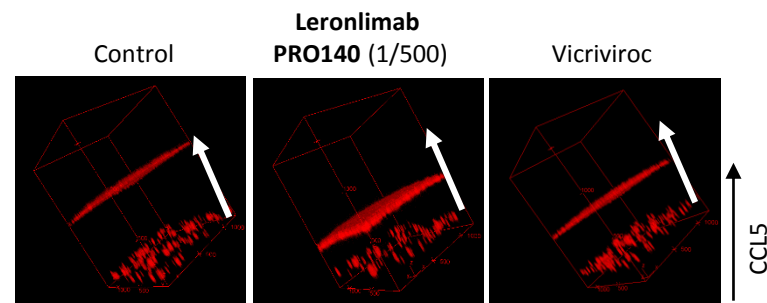
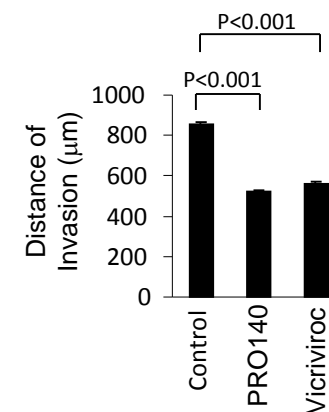
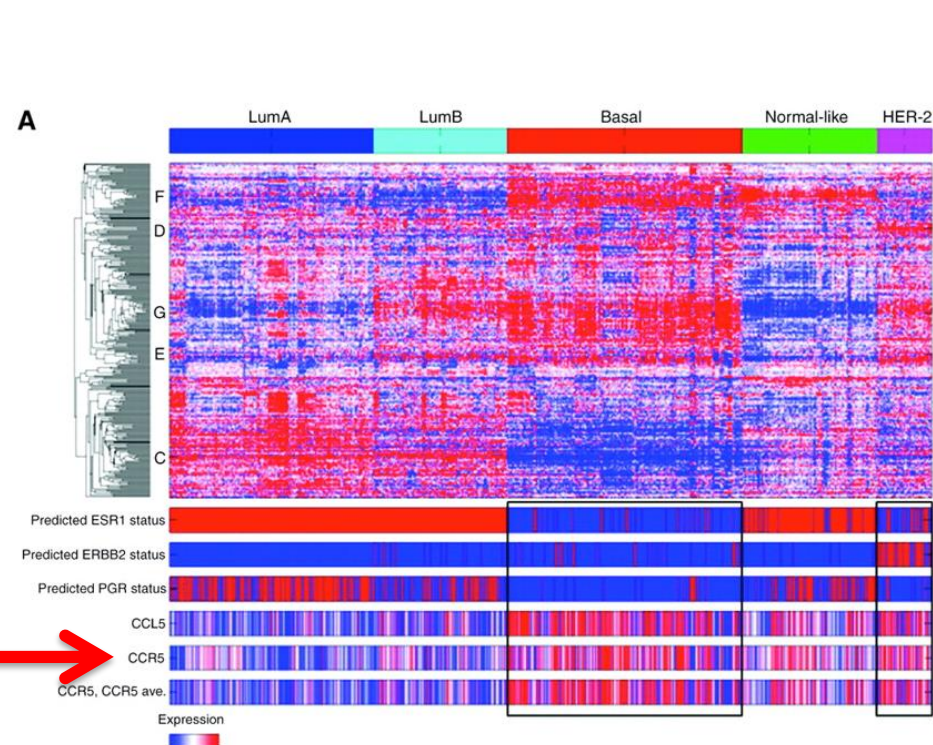


- Named world-renowned oncologist Dr. Richard Pestell Chief Medical Officer and Vice Chairman (<https://www.youtube.com/watch?v=98J1HgCm8wU>)
  - Leads leronlimab (PRO 140) non-HIV development programs
  - Led 2 National Cancer Institute-designated cancer centers
    - Lombardi Comprehensive Cancer Center at Georgetown University
    - Sidney Kimmel Cancer Center at Thomas Jefferson University
- Executive Vice President Thomas Jefferson University (25,000 employees, \$5.6B)
- Founded ProstaGene to develop CCR5 technology in cancer
  - Issued patents for technology on metastasis (many types of cancer)
  - Showed > 50% of 2,200 patients -increased CCR5 in breast cancer
  - CCR5 inhibitors blocked breast, prostate and colon cancer metastasis in pre-clinical studies

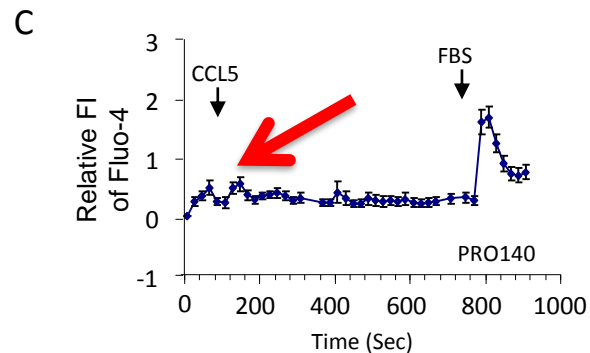
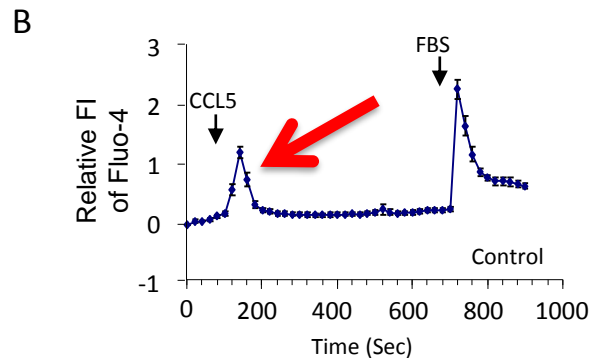
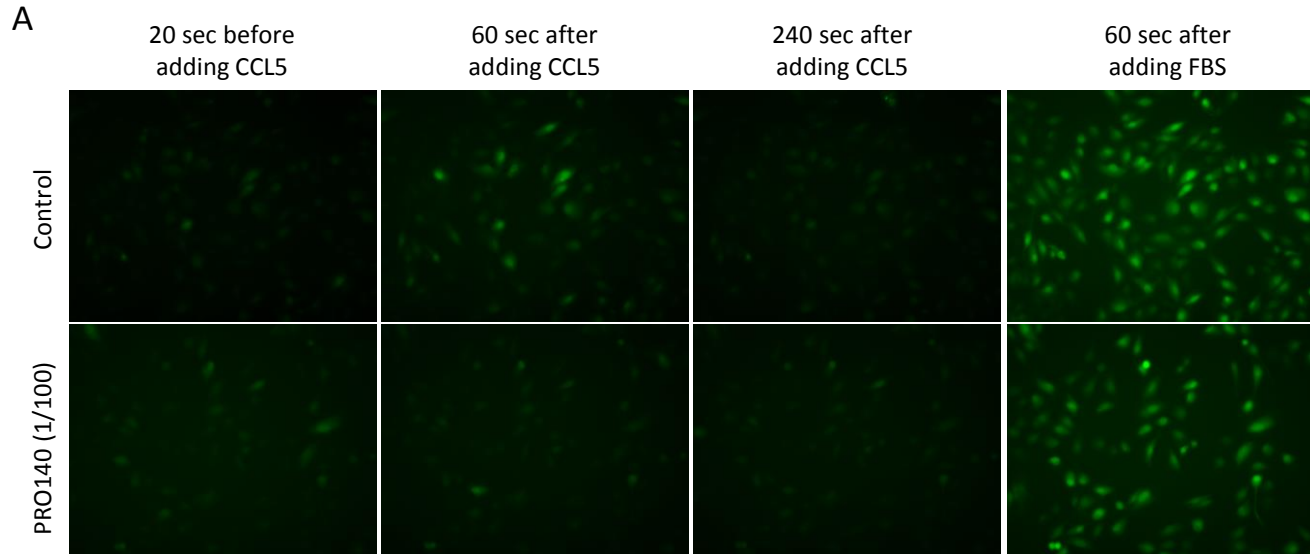
# CCR5 is Expressed in >50% of Breast Cancer

## – Metastatic cancer.

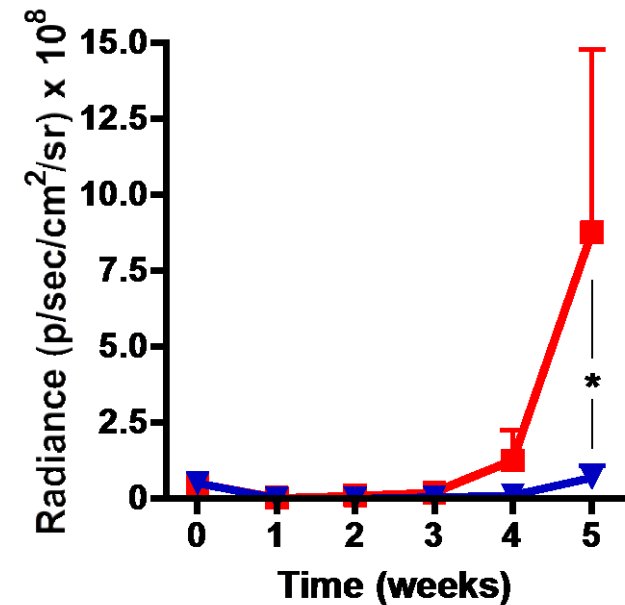
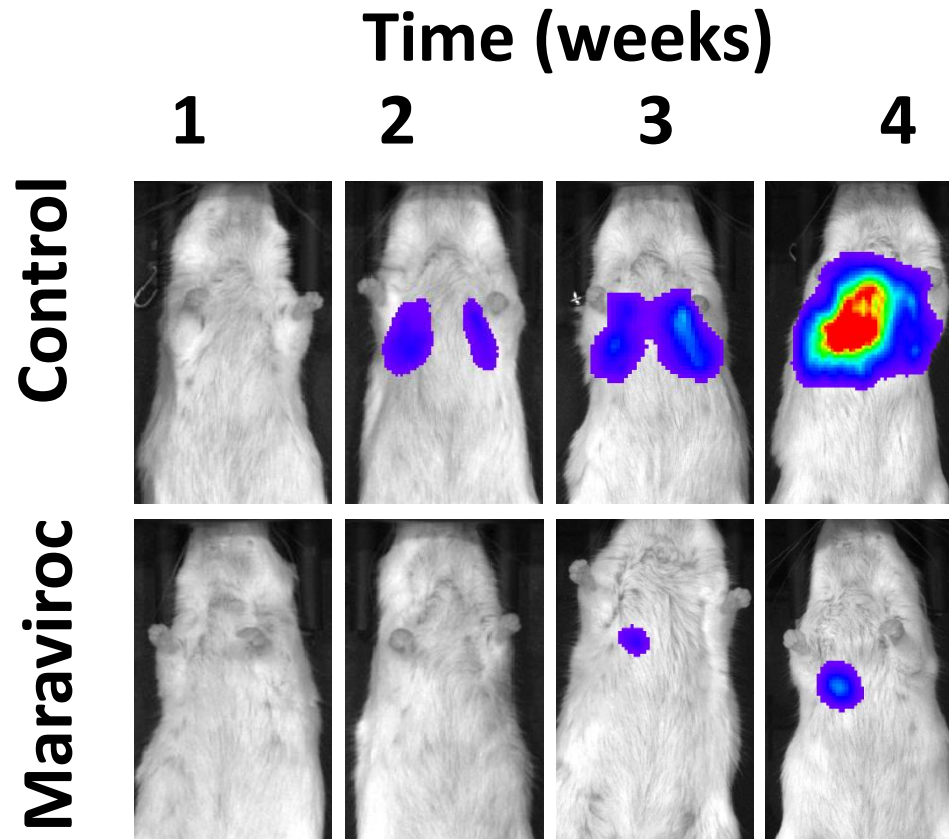
- 50% of breast cancers CCR5+
- Leronlimab (PRO 140) reduces breast cancer invasion in pre-clinical studies

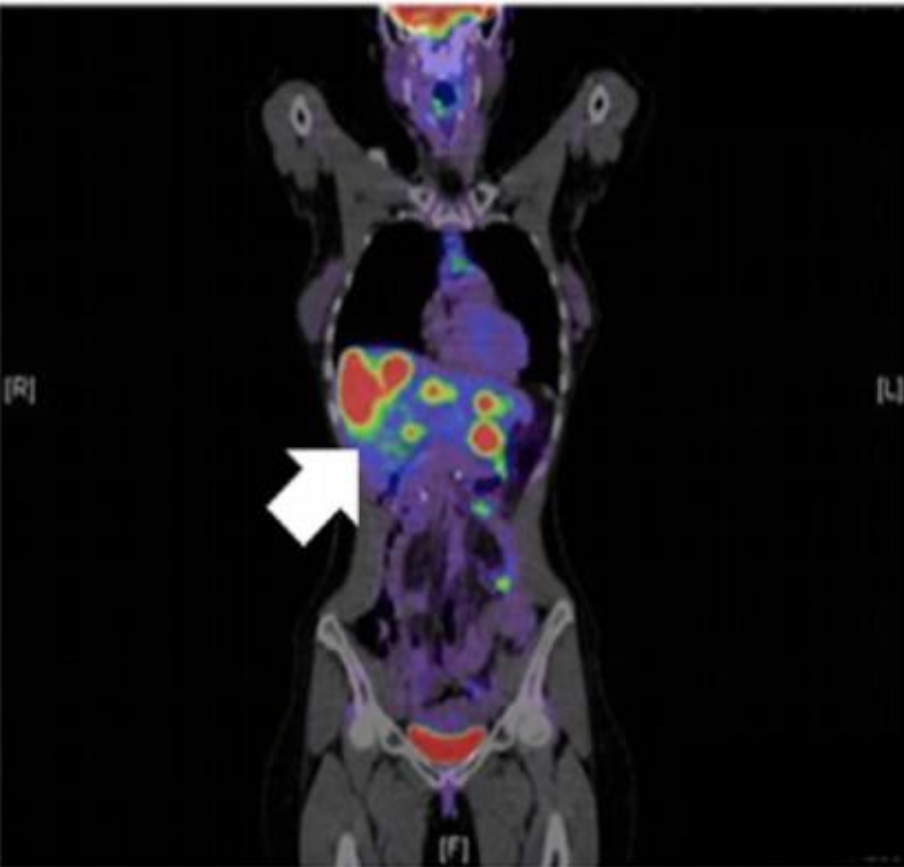


# Leronlimab (PRO 140) Blocks Breast Cancer $\text{Ca}^{+2}$ signaling

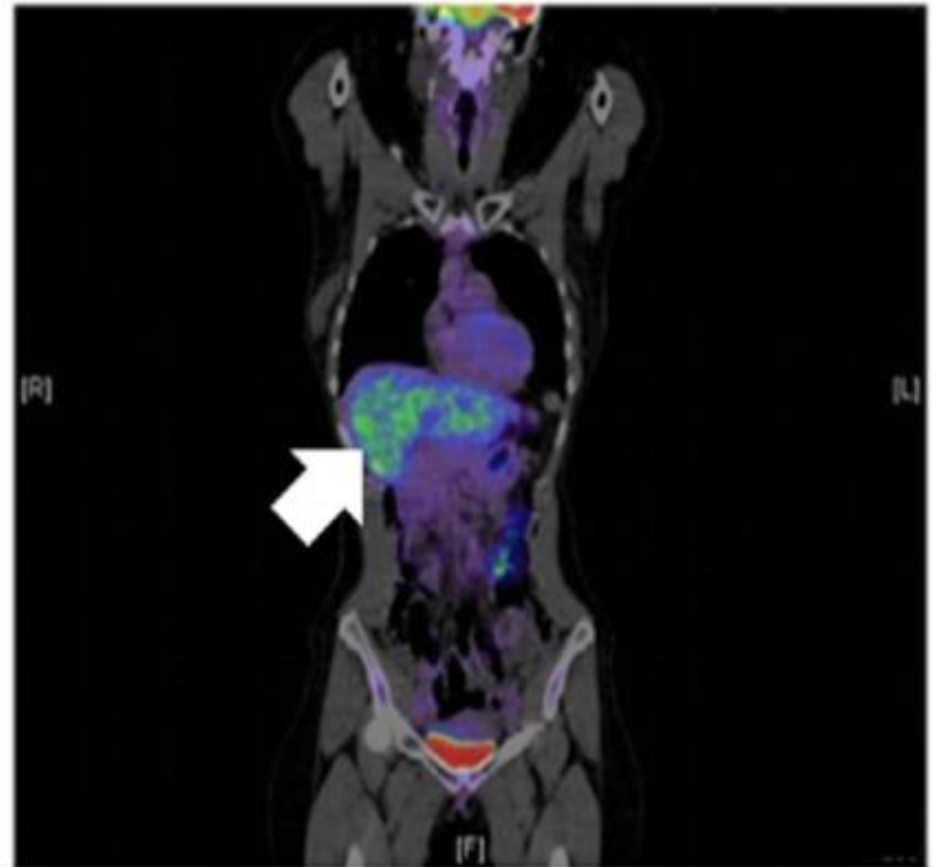


# CCR5 Antagonists Block Breast Cancer Metastasis





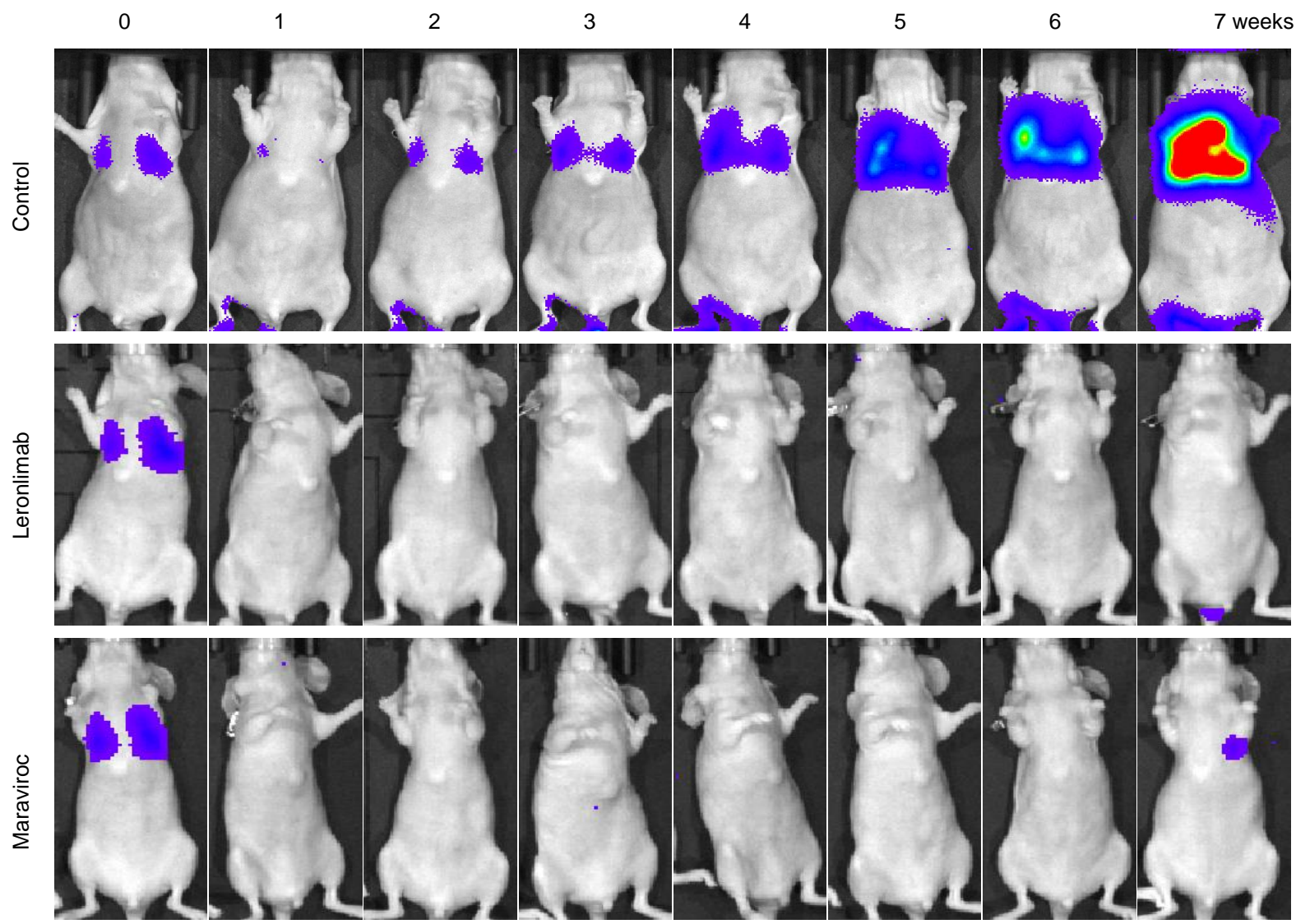
before CHT+CCR5 inh.



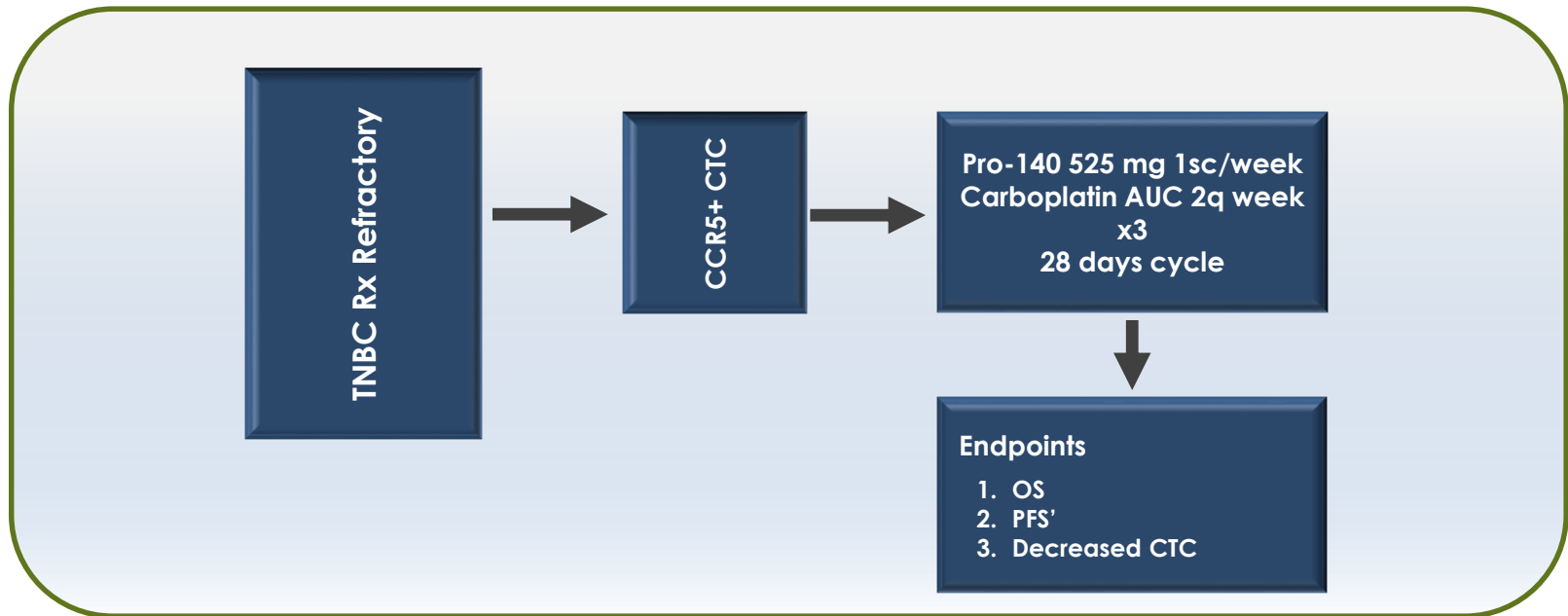
after CHT+CCR5 inh.



# CCR5 Antagonists Block Metastasis



# Leronlimab (PRO 140) Breast Cancer Trial

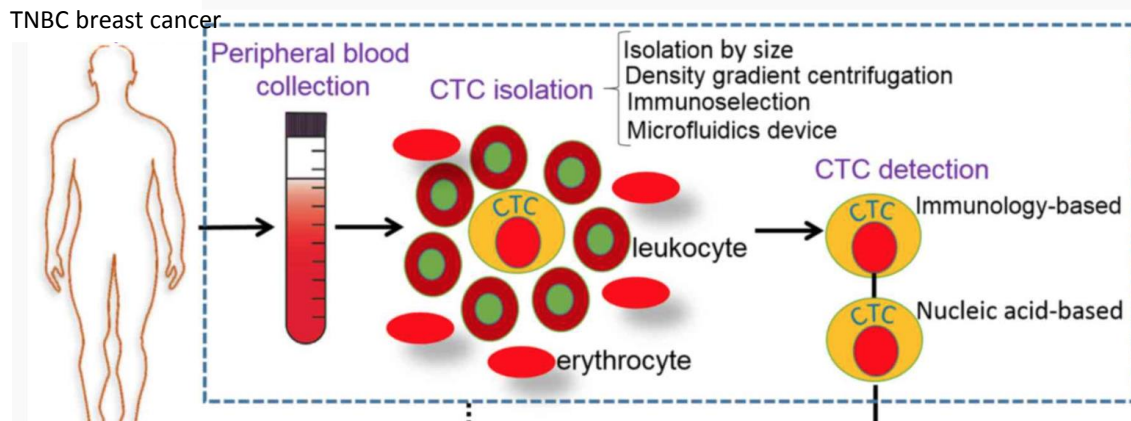


November 2018-December 2019  
Phase II

Breakthrough (unmet need)  
April 2019-July 2021 (Phase III)

1. AACR presentation April 1 Atlanta Georgia.

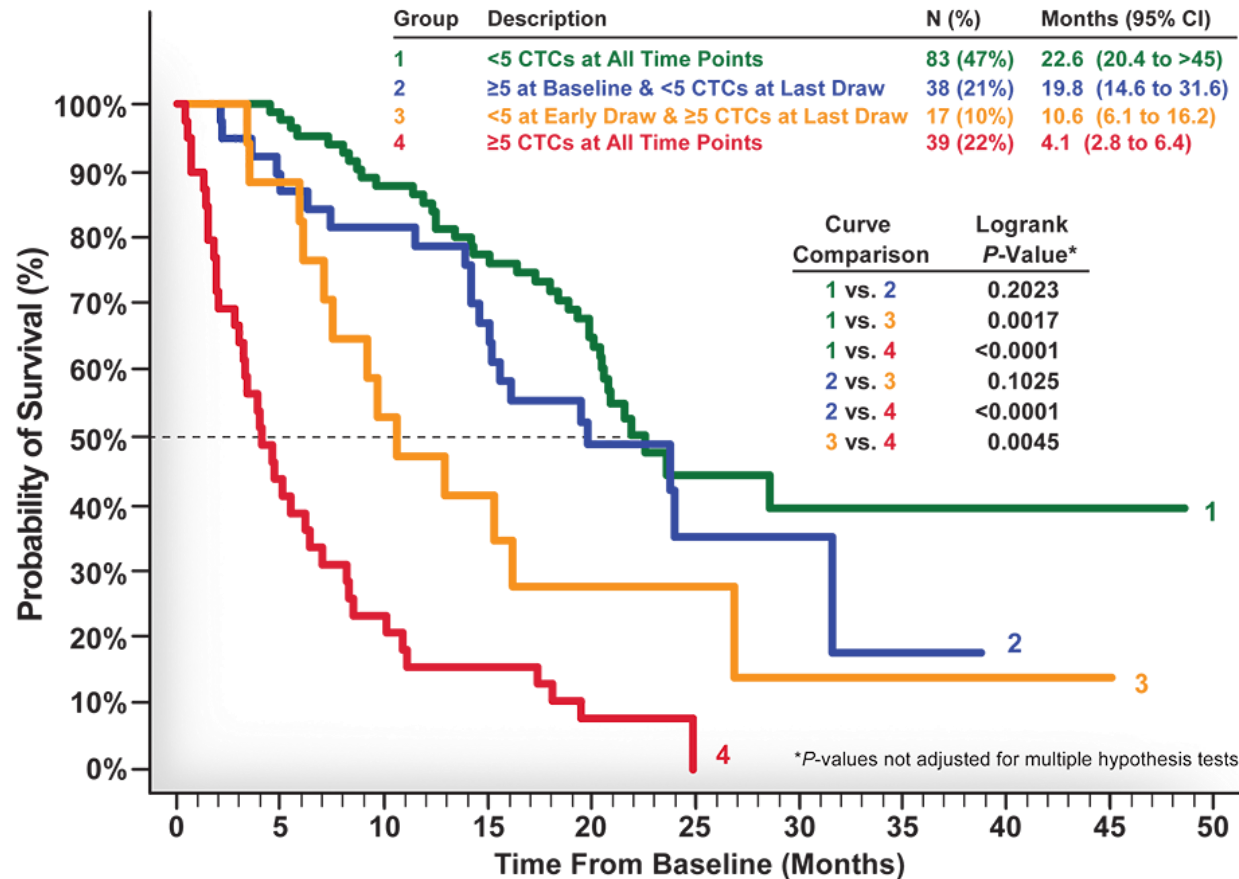
**CCR5 associated with HER2 in circulating tumor cells (CTCs)**  
**is a novel biomarker for patients with metastatic breast cancer (MBC)** . CTCs were found positive ( $\geq 5$ ) in all seven MBC patients with a range of numbers between 124 and 442





# Trial open to accrual measuring CTC

A Reduction in CTC to Below 5 After the Initiation of Therapy Predicts Longer OS whereas an Increase in CTC Count to 5 or above Predicts Shorter OS in mBC Patients.



# Trial open to accrual

1. Pacific Hematology Oncology Associates  
Dr. Milana Dolezal [mdolezal@phoamd.com](mailto:mdolezal@phoamd.com)  
2100 Webster street suite 220, San Francisco, ca 9411  
[david@PHOAMD.COM](mailto:david@PHOAMD.COM)  
415-923-3012

Other sites to open:

1. Northwestern University Medical School,
2. Methodist Houston,
3. Vanderbilt University,
4. Sidney Kimmel Cancer Center.



# PRO 140 Important Milestones for HIV and Cancer 2019



Milestones	Target Dates
BLA submission – HIV combination therapy – unmet medical need	3Q2019
Revenue potential of about \$480 million	2020
Initiate first ever monotherapy Phase 3 pivotal trial	1H2019
Triple-Negative Breast Cancer study first patient injected	2Q2019
Triple-Negative Breast Cancer study interim results	2019
GvHD interim results	2H2019
Prognostic test licensed – 510(k) filing with the FDA	1H2019
IND-Protocol for colon cancer Phase 2	1H2019
Large Pharma discussion for potential licensing or partnering	1H2019
8 preclinical studies with leronlimab - Filing 8 INDs for 8 Phase 2 trials (if results of preclinical studies are positive)	2019

# Leronlimab (PRO 140)



Trading Symbol  
**CYDY**

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**CYDY**



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