Primary Results: An Open-Label Phase 2 Study of Maintenance Therapy with OST31-164 After Resection of Recurrent Osteosarcoma (OST31-164/AOST2121)

June 28th 2025 MIB - FACTOR

Listeria Monocytogenes Platform

Off-the-Shelf Cancer Immunotherapy Platform

Platform Inventor: Dr. Yvonne Patterson from U Penn

Principle Investigator: Dr. Damon Reed

Lead Veterinarian: Dr. Nicola Mason from U Penn

Dr. Yvonne Patterson
Microbiologist

Dr. Nicola Mason
Veterinary Medicine

- Listeria monocytogenes (*Lm*) is a facultative anaerobic bacterium. It can grow and reproduce inside the host's cells and is a virulent foodborne pathogen.
- Dr. Patterson patented the use of an attenuated *Lm* vector that was engineered to generate an immune response against cancer cells that overexpress specific tumor antigens, identifying them as listeria infected cells, and activating cellular immunity, including cytotoxic T cells, to kill the cancer

Perelman School of Medicine University of Pennsylvania

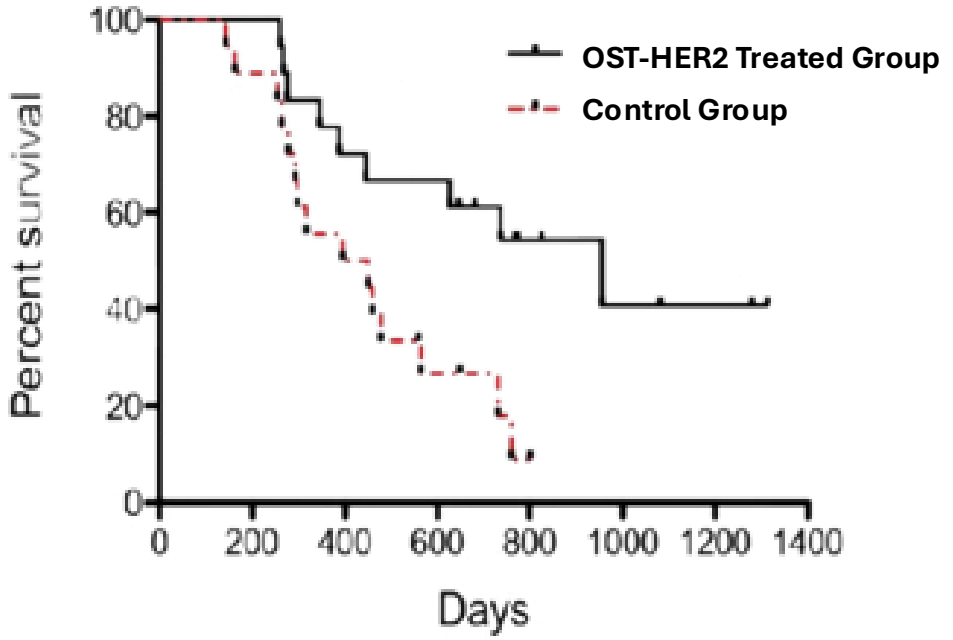
Perelman School of Medicine University of Pennsylvania

- In 2016, Dr. Nicola Mason identified potential uses in Osteosarcoma in animals and successfully completed trials that led to veterinary conditional approval by USDA for canine osteosarcoma
- AOST-2121 is the first clinical trial in Osteosarcoma with OST-HER2

CHILDREN'S ONCOLOGY GROUP

CANINE OSTEOSARCOMA INFORMED CLINICAL TRIAL

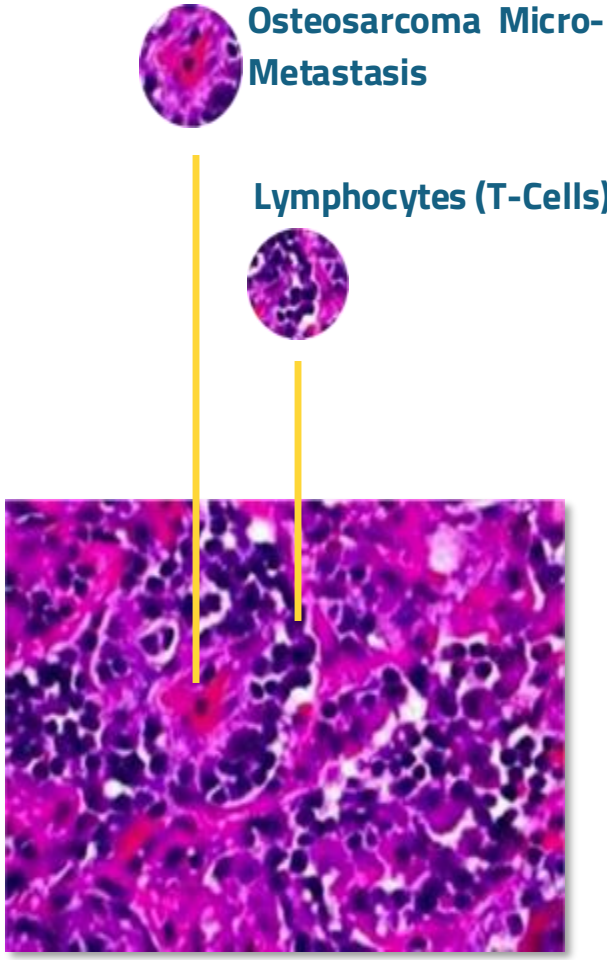
DESIGN



Mechanism of Action

Lymphocytes (T-Cells) Kill Metastases (Cancer Cells)

- Intravenous OST-HER2 vector rapidly cleared by immune system's antigen presenting cells (APCs)
- APCs strongly activated to generate potent HER2 specific T-cell response
- T-Cells proliferate, travel through blood to hunt down the OS Micro-Metastasis
- Cancer cell contents spill out revealing additional cancer targets
  - Epitope Spreading
- T-Cells are generated against the new targets, repeating the cycle and extending the treatment effects



OSTX Safety vs. Advaxis Lm development:

Antibiotic at 4h vs. 72h - ***Exposure to 4h of Lm yields same immune response as 72h***

Open Label, Phase 2b Trial:

CHILDREN'S ONCOLOGY GROUP

Enrollment Criteria

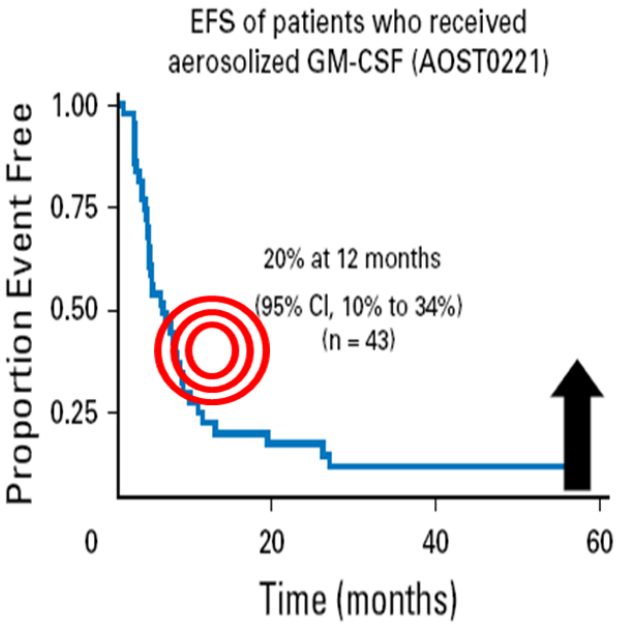
- 12-39 years old
- Recurrent, fully resected, lung metastatic Osteosarcoma
- Comparator was a single agent GM-CSF trial conducted through the Children's Oncology Group and a trial design developed by the COG[1]
- All patients were dosed 16 times every 3 weeks for 48 weeks post enrollment w/4-week follow-up final visit

Primary Endpoint: 12-month Event Free Survival (EFS) vs Historical Control (COG); a past trial

Co-Primary Endpoint: Safety of OST-HER2 throughout treatment

Secondary Endpoint #1: Overall Survival (OS)

Exploratory Endpoints: including HER2 correlates of immune response, genomic features



1. J Clin Oncol. 2016 Sep 1;34(25):3031-8. doi: 10.1200/JCO.2015.65.5381. Epub 2016 Jul 11.

AOST2121 Patients and Results:

Patient Outcomes & Demographics

- 41 patient enrolled, meaning they received at least 1 dose
- 2 withdrew consent
  - 1 did not allow follow up, and 1 with progressive disease
- with 40 evaluable patients for the primary end point enrolled at 21 centers

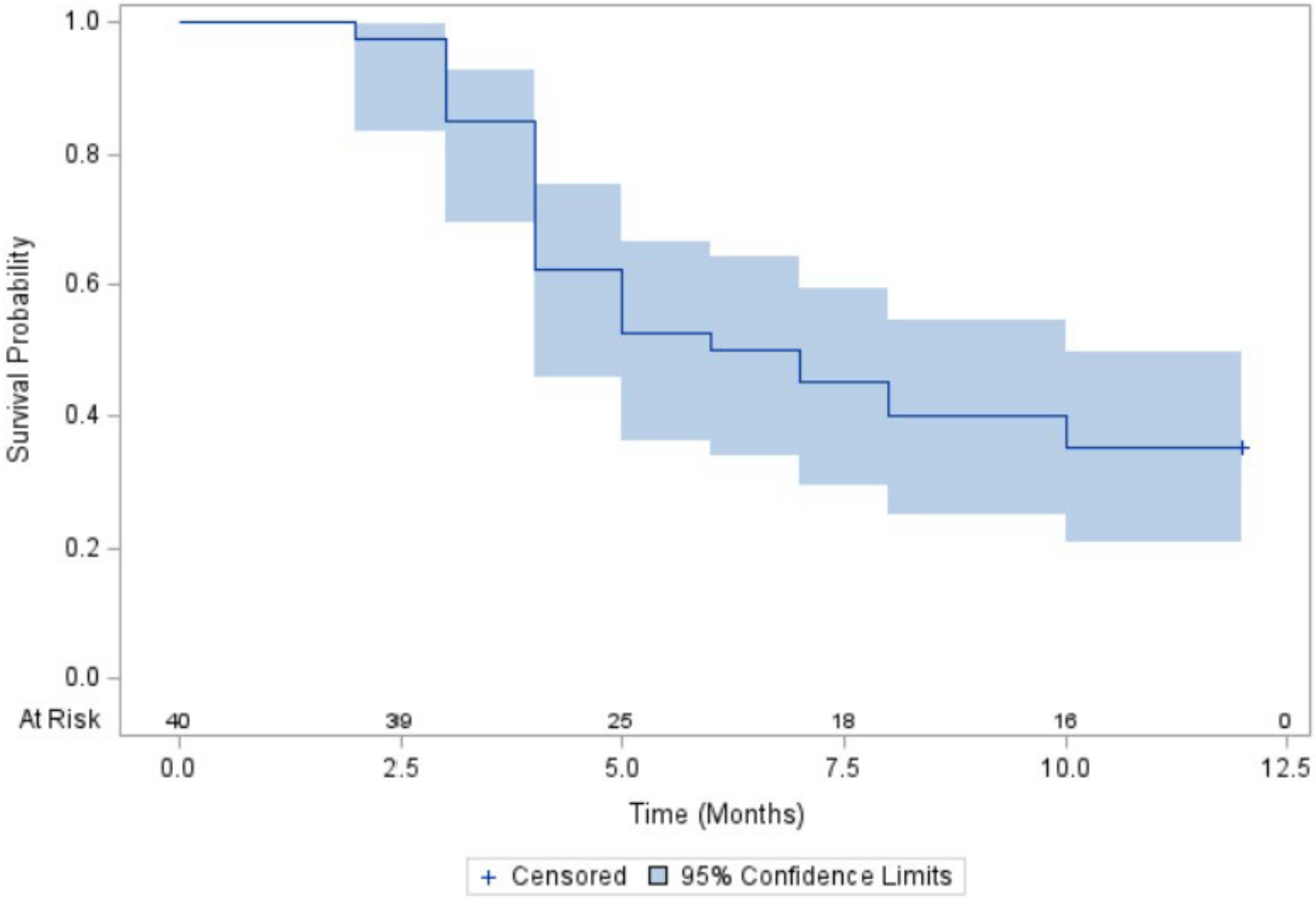
Age Range = 12-30 yrs.
Pediatric Population (Age <17 at trial start): N=24
Adult Population (Age >=18 yrs. at trial start): N=17
20 Female, 19 male

- **Primary Aim, Event free at 12 months:**

12 Patients completed all 16 doses and 1 patient chose to stop therapy and was event free at 12 months after stopping therapy and remained event free at 1 yr. from first dose **(EFS at 1 year = 14/40 = 35%, confidence interval 20.8-49.6%) with one patient progressing at 12 months**

- 26 patients experienced progression while on study prior to 12 months

OST-HER2 Phase 2b Trial: EFS



OST-HER2 Open Label Phase 2b Trial (AOST-2121): SAFETY

- **12 of 39 patients had a serious adverse event**

- **Includes 4 with cytokine release syndrome, nausea, febrile neutropenia, bacteremia (2, 1 below), infusion related reaction, exposure during pregnancy, rhabdomyolysis, wound closure, hypotension, disease progression and suicidal ideation**
- **Rhabdomyolysis** reported on one pt. with elevated CK.
  - Written communication sent to sites to raise awareness based on U/A findings. The team implemented a protocol amendment and updates to the Informed Consent Form.
- SAE of note: asymptomatic **+blood culture with the study agent** after therapy and after protocol specified 28-days of antibiotics, SAE reported 07Mar2023 and culture confirmed to be the study agent.

CHILDREN'S ONCOLOGY GROUP

Thank you

- **To the Patients and Families**

- To all open/enrolling sites

- Vice Chair: Kelly Bailey
- Katie Janeway

- Nicola Mason
- Amy Leblanc
- Leo, Brooke, Lars, Joanne (DSMC)

OS Therapies, Inc/Informa

- Paul Romness
- Robert Petit
- Jack Doll
- Vicki Brennan
- Ted Search
- Peter Burch

Children's Oncology Group

- Nicole Towcimak
- Jessica Mills
- Megan Johnson

George Clinical

- Jenn Gargione
- Julie Pickett