

# A PATIENT DERIVED XENOGRIFT MODEL FOR LUNG ADENOCARCINOMA USING OBAGEL®, A HUMAN DERIVED HYDROGEL.

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Problem Statement

- Patient Derived Xenografts (PDXs) are valuable disease models as they preserve the tumor microenvironment's structure, providing the most clinically relevant in vivo testing platform.
- Most models still use animal derived hydrogels as scaffolds for patient derived cells, reducing the potential to fully mimic the physiological microenvironment of the disease and human condition.

Concept

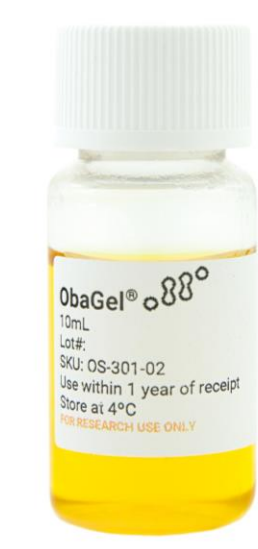
- ObaGel® is a human-derived hydrogel successfully deployed for supporting 3D cell culture, organoid, perfusion bioreactor, and/ microphysiological system development for studying obesity, type II diabetes, and various forms of related cancers.
- We investigated the use of ObaGel® in the in-vivo development of a PDX-derived culture of lung adenocarcinoma and compare its performance to currently used animal derived hydrogels

Methods

3 X 10<sup>6</sup> CRT00295 Non-small cell lung adenocarcinoma cells in 100ul 50:50 indicated Gel in PBS per injection site; the study used 10 NOG mice per condition

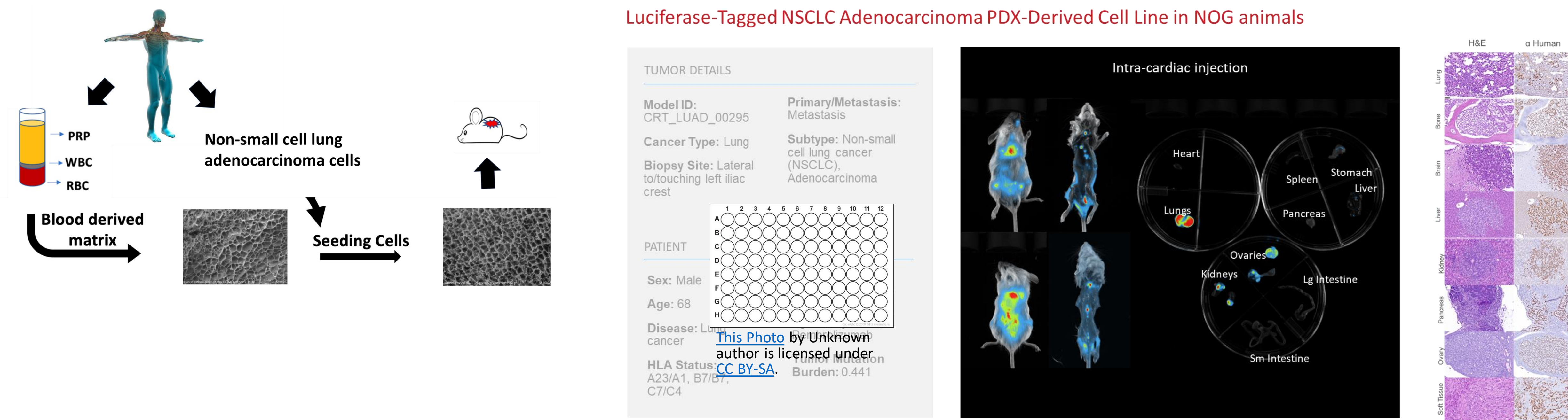
Results

## I. ObaGel®, a human-derived hydrogel

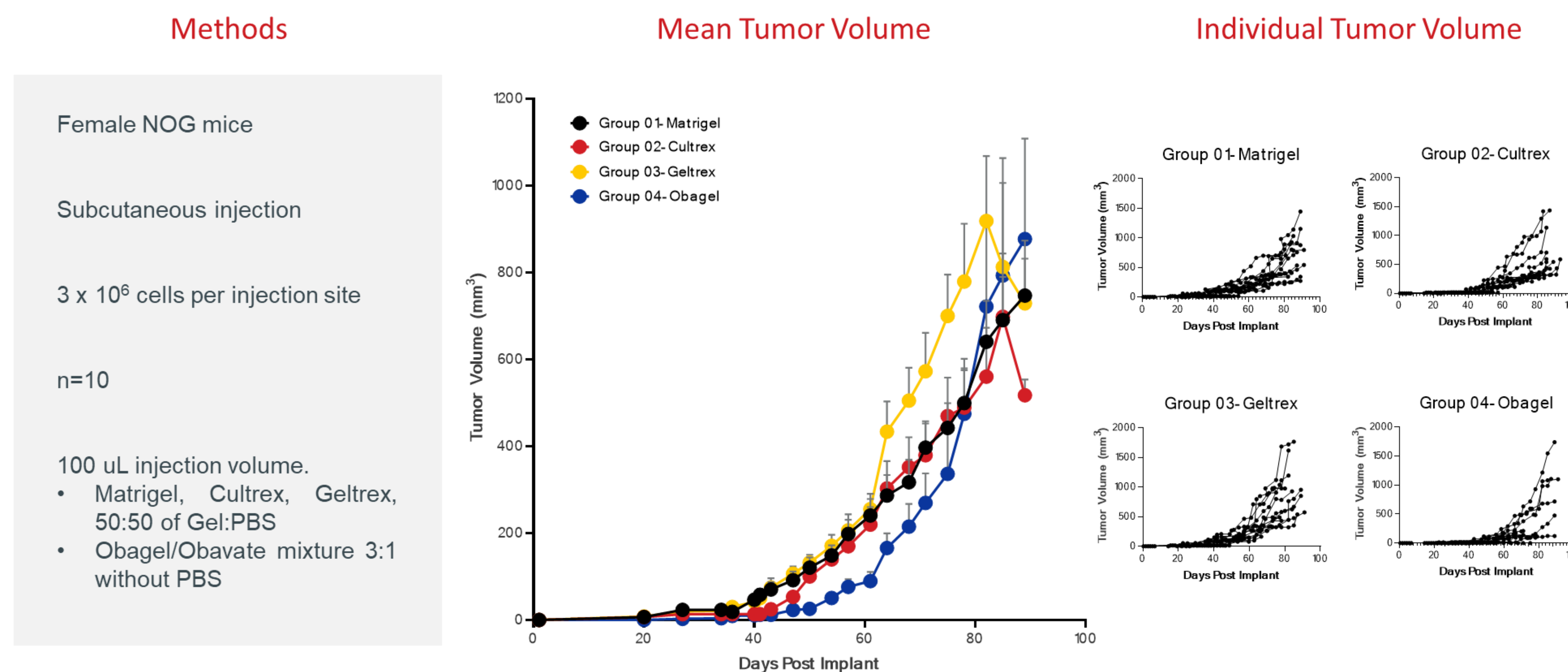


- Human Blood Derived Product
- Biocompatible with stromal/stem cells
- Sourced from human tissue
- Consistent properties batch to batch
- Tunable biomechanical properties adjustable for soft & hard tissue repair
- Retains liquid status at 4-8° C while gelling at 37° C
- Volume retention without contraction after long-term implantation
- Mesenchymal stromal/stem cells (MSC) from adipose and bone marrow
- Stromal vascular cells (SVF)
- Endothelial progenitors (EP)
- Human umbilical cord epithelial cells (HUVEC)
- Induced Pluripotent Stem Cells (iPSC)
- Prostate cancer immortalized cell lines
- Breast cancer immortalized cell lines
- Endometrial cancer primary cells
- Lung adenocarcinoma primary cells

## II. PDX model for Lung Adenocarcinoma using ObaGel (Background)



## III. Gel comparison study for lung adenocarcinoma patient derived Xenografts

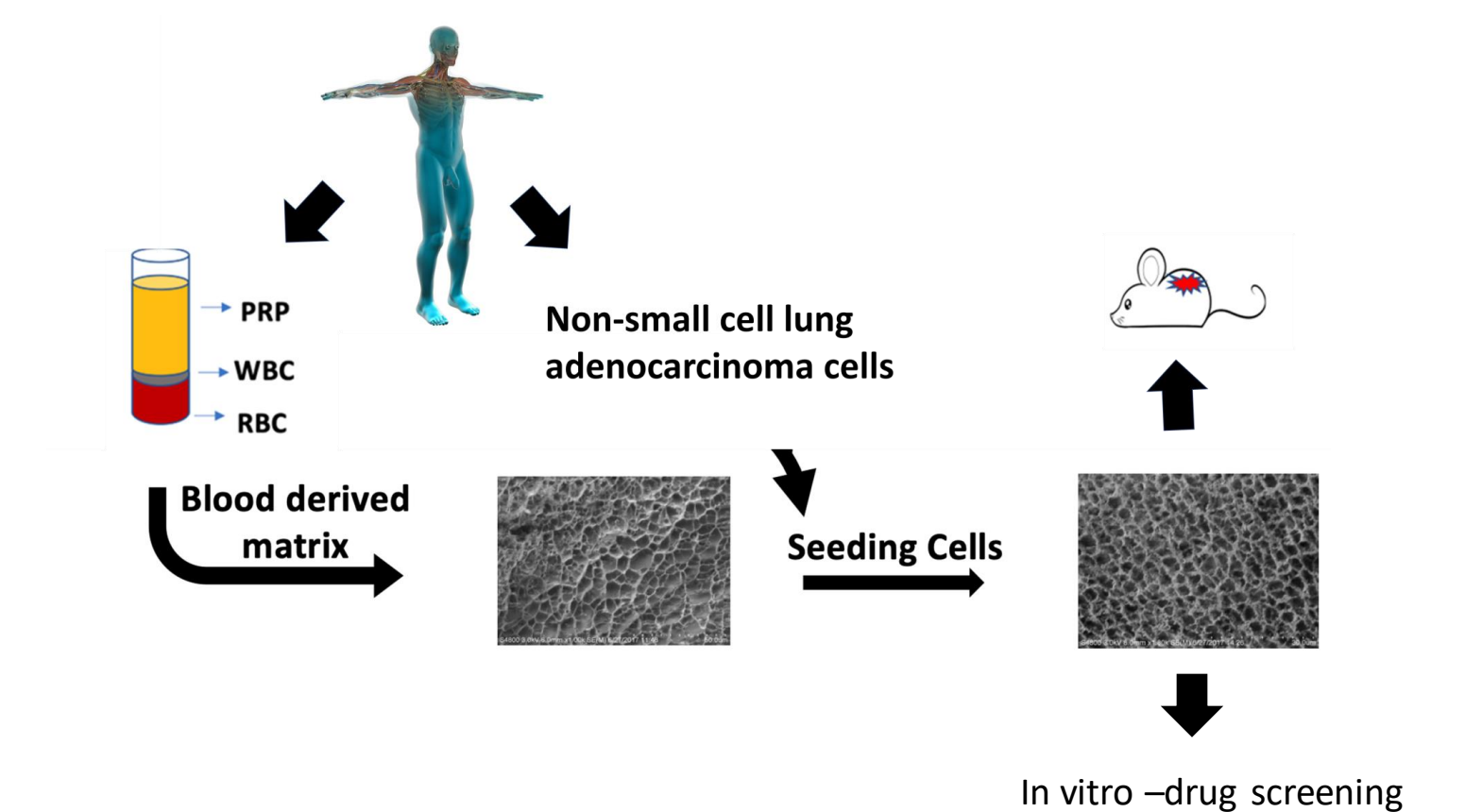


The results indicated that ObaGel® performed similarly in terms of engraftment and tumor kinetics compared to animal derived hydrogels such as Cultrex, Geltrex, and Matrigel, using a patient-derived xenograft culture of lung adenocarcinoma.

Conclusions

- Our data supports the use of a human-derived hydrogel for PDX models.
- ObaGel® performs equivalently to animal derived hydrogels to support tumor volume over time. Our human derived hydrogel provides a better microenvironment for lung adenocarcinoma.
- Obagel® can also be adapted for use as xenografts in other tissue/disease models

Directions



- ObaGel®: Human blood-derived product
  - Source: AABB Accredited Blood Banks
- Properties:
  - Protein profiles enhance cell growth
  - Lot-to-lot variability decreased by pooling
  - Growth factors and hormones closely mimic in vivo environment
- Applications
  - Bioprinting and bio-ink development
  - Disease modeling
  - Organoids, organs-on-chips
  - PDX modeling
  - Patient-derived xenograft