Patient-Derived Tumor Xenografting Services

Provider of Preclinical Research Services (GLP/non-GLP) for Drug Discovery
Efficacy and Pharm/Tox IND contract research studies (clients worldwide)
100+ Xenograft Models (validated in-house) and IND-enabling Toxicology studies
100% IP belongs to client, experienced IACUC-regulated barrier facility

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Background

- Altogen Labs is a GLP-certified biotechnology laboratory that provides research services for pharmaceutical, biotechnological, and academic institutions worldwide.

- The laboratory provides a variety of both *in vivo* and *in vitro* services.

- It was founded in 2008 and it is headquartered in Austin, Texas.
Services

Altogen Labs offers human-in-mouse xenograft services for drug development of anticancer therapeutics.

PDTX (patient derived tumor xenograft models) are a solution to a common problem in the oncology field: a lack of preclinical models that have strong predictive power in clinical trials.
Xenografting

- Xenografting is the transplantation of tissue from one species into another.
- It has been established as a benchmark study in pre-clinical cancer research.
- Typically, immunodeficient mice serve as hosts for a wide variety of human tumors, effectively serving as models for human subjects.
- Xenografting is a complete and accurate study of tumor growth and the activity of drug administration.
How does it work?

PDTX are able to establish predictive power by directing engrafting patient tumors in immunocompromised mice.

Because they are able to mimic patient heterogeneity, it gives them a far higher predictive ability than traditional methods.
**PDTX Models**

It is important for cancer-specific PDTX model to retain:

- Stability
- Principle histological tumor features
- Pathogenesis
- Global gene expression
- Therapeutic response
Potential Inaccuracies of typical PDX models

Although preclinical models are at the foundation of cancer therapeutics, they may fail to recapitulate the key aspects of human malignancies and thus do not accurately predict drug effects in the clinic.

Although curated xenografts have shown high effectiveness in predicting response to targeted agents, they do not replicate tumor microenvironment and interactions within the immune system.
What does this mean?

Accuracy of predicted response is highly important, so this means there is a need for improved and more clinically predictive models for human cancer.
Most effective model

PDX models are created through the implantation of primary human tumor materials directly into an immuno-compromised host (laboratory rats/mice) to prevent transplant rejection.

Several types of hosts are used, such as nude mice or SCID mice. The NOD-SCID mouse is considered more immuno-deficient than the nude mouse because they lack natural killer cells, thus they are more commonly used.
Model advantage

These models have an advantage over cell line xenografts because the tumor retains a more natural architecture and are more reflective of heterogeneity and histology seen in primary tumors.
In patient-derived tumor xenografting, primary tumor cells from the patient are transplanted into immunocompromised mice.

Its advantages over traditional xenograft studies:
- Retains histological profile of parent tumor
- Pathogenesis
- Global gene expression
- Therapeutic response

Patient-derived Xenografts represent a more accurate predictive model of clinical success.
The relative scarcity of success in oncologic drug development is credited to the shortage of pre-clinical experiment systems that can accurately predict clinical trial success.

- Patient-Derived Tumor Xenograft (PDX) models have narrowed this research gap.
- PDX studies’ roles in pre-clinical research will expand in the future as personalized medicine begins to take prominence.

Patient-derived Xenografting has advanced significantly pre-clinical cancer research.
Advantages of PDX

- Evaluate the efficacy and toxicity of potential therapeutic agents
- Develop new therapeutic agents quickly, efficiently and cost-effectively
- Evaluate target compound activity using in vivo system (human cells)
- Predict cytotoxicity of cancer drugs
<table>
<thead>
<tr>
<th>Number</th>
<th>Character ties</th>
<th>Cell line in vitro</th>
<th>Cell line xenograft</th>
<th>PDX</th>
<th>Patient</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Heterogeneity</td>
<td>Nil</td>
<td>Limited</td>
<td>Higher intra tumor heterogeneity</td>
<td>High intra tumor heterogeneity</td>
</tr>
<tr>
<td>2.</td>
<td>Molecular subtypes</td>
<td>Modest diversity</td>
<td>Modest diversity</td>
<td>Diverse range of molecular subtypes</td>
<td>Full range of molecular subtypes</td>
</tr>
<tr>
<td>3.</td>
<td>Stroma</td>
<td>Nil</td>
<td>Murine stroma/no human stroma</td>
<td>Mixed murine &amp; human stroma</td>
<td>Human stroma</td>
</tr>
</tbody>
</table>
**PDX Studies**

PDX studies allow for biomarker identification that can be leveraged for the development of novel targeted therapies.
PDX Models Established at Altogen Labs

PDX Models are established by obtaining fresh patient tumors from surgery into single cell suspensions, which are then injected (either heterotopically or orthotopically) into immunocompromised mice. The following PDX models have been established at Altogen Labs:

- Pancreatic
- Prostate
- Colorectal
- Breast
- Lung
Contact Us

- PDX models are at the cutting edge of pre-clinical oncology research, and our team of scientists has a documented track record of establishing and performing these studies.
- Altogen Labs is compliant as a Good Laboratory Practices (GLP) environment.

Contact us to discuss details, timeline estimates, and price!