



Case Study

Unlocking the future
of gene therapy with
AI-powered design

Dyno Therapeutics





Solving the challenge of in vivo delivery with next-generation DNA technologies and machine learning

Dyno Therapeutics is a Watertown-based, VC-backed biotech startup. Dyno’s mission is to empower high potential teams to transform patients’ lives with cutting edge science. Through the use of AI and machine learning, Adeno-associated Virus (AAV) capsids are engineered for effective delivery of gene therapies to every cell, for every patient.

Company Profile

Industry
Biotechnology

Corporate HQ
Watertown, MA

Improved scientist efficiency

Moving off legacy tools and centralizing R&D on a unified, collaborative platform has saved scientists valuable time.

Faster time to milestone

By making data more accessible and extensible, teams are able to progress science forward faster.

Increased probability of success

As teams become better positioned to make use of data, improved decision making has increased the chances of technical success.

“When we first started training machine learning models, we were standardizing and documenting sample info even as we were assembling training data, and it was a laborious process. But once we standardized the sample ontology for input into Benchling that enabled us to build workflows on the machine learning side that were much more streamlined, pulling from standardized labels automatically so that we could train models that optimize across multiple in vivo properties. This enabled us to scale up machine learning.”



Eric Kelsic
Founder & CEO



Challenges

Disconnected, legacy software slowed scientists down

Prior to using Benchling, scientists at Dyno relied on an inefficient integration of OneNote and Google sheets for documenting notes, a process that left room for error.

Inaccessible data posed a barrier to adopting automation

A lack of flexible and readily available data prevented Dyno from reaping the benefits of AI/ML models.

Internal silos stifled organization-wide innovation

The Data Science team at Dyno was previously insulated from the work of experimental scientists, creating silos that slowed down the organization's progression.

Outcomes

Improving scientist efficiency by reducing manual data management

Dyno previously relied on siloed systems and processes, leading to uncontextualized data, and time lost manually aggregating data sets. Disparate files and software for notes also resulted in a lack of standardization across teams. With Benchling, Dyno scientists can now save time on data management by streamlining how and where data is stored. Having a centralized, integrated solution provides everyone with shared context, and reduces time spent on manual, error-prone data management tasks.

Having rich and consistent metadata across samples is critical for Dyno to have confidence in the outputs of their ML models. Benchling enables Dyno to harmonize schema fields and enforce inherited metadata for samples that derive from the same parent groups far separated in their work streams.

Achieving faster time to milestone by establishing FAIR data

The ability to manage and connect complex data and processes is becoming increasingly critical for bringing scientific research to market. In order to do so, organizations must adopt informatics solutions that enable the centralization of well described, standardized, and accessible data. With Benchling, Dyno was able to increase alignment with centralized and FAIR data management, making data accessible and usable for AI and ML models.

Dyno uses ML to find AAV capsid sequences that have high cell target specificity, amongst other criteria. ML models allow scientists to replace resource-intensive experiments with in silico screening. Biological insights can be incorporated into ML architectures in a way that bolsters model robustness, allowing for more accurate models trained by less data.

Increasing the probability of success with improved decision making

With Benchling as a central source of truth, Dyno has achieved a new level of data transparency. Because experimental data and metadata is centralized on an open platform, labs can increase automation and instrument connectivity in support of critical R&D milestones. By centralizing and harmonizing instrument data into a common format, Dyno has been able to break down barriers to foster real time collaboration and decision-making.