uncountable

CASE STUDY

Uncountable partners with St. Jude Children's Research Hospital in screening of Kinase structure.

St. Jude Children's Research Hospital is researching the structure of previously unknown Kinase conformations. They have acquired the United States' largest field NMR instrument to create a highly detailed view of the structure of the kinase structures following their work on an ABL Kinase[1].

ABL-family proteins are a branch of the tyrosine kinases that are central agents in several forms of cancer including chronic myelogenous leukemia (CML). The severity of these cancer cells is due to a fusion of the ABL and BCL genes that fuels the growth of the leukemic cells.

Treatments such as *Imatinib* target this fusion gene and have been successful at stopping this growth rate. Over time, however, these cancer cells develop a resistance to drugs targeting fusion genes. So there is a need to better understand the structure of kinase proteins so that more effective treatments can be developed.

Uncountable has partnered with the Kalodimos Lab at St. Jude to provide them with a platform for storing and visualizing data critical to the research process.

[1] Published in: Xie T, Saleh T, Rossi P, Miller D, Kalodimos CG. Imatinib can act as an Allosteric Activator of Abl Kinase. J Mol Biol. 2022 Jan 30;434(2):167349. doi: 10.1016/j.jmb.2021.167349. Epub 2021 Nov 10. PMID: 34774565; PMCID: PMC8752476. https://pubmed.ncbi.nlm.nih.gov/34774565/

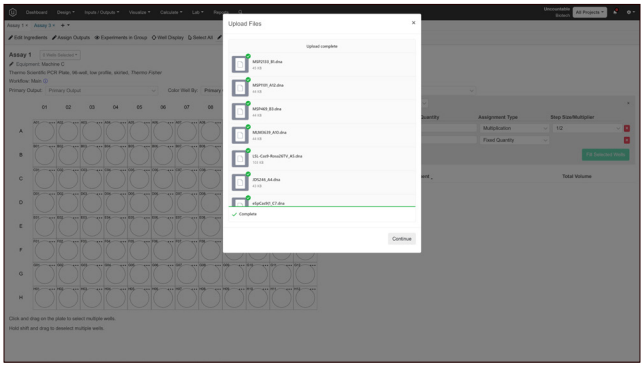
“Uncountable’s team is incredibly responsive and collaborative. They have built an ambitious system and truly deliver a new way of working with a large team of scientists.”

Charalampos Kalodimos

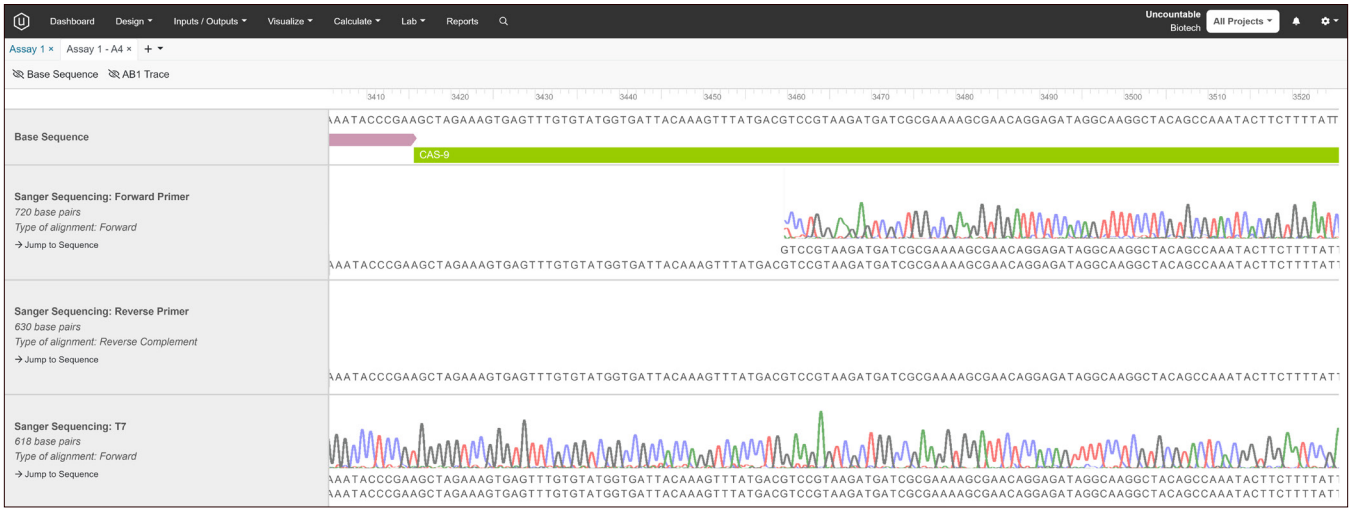
PhD, Principal Investigator and Chair of Structural Biology at St. Jude Children’s Research Hospital

Uncountable ensures that a large team of collaborators can access all of the information their colleagues collect in the lab.

The research initiative at St. Jude’s includes screening hundreds of mutations to proteins across fifteen kinase families and then studying their conformational structure with the 1.1 GHz NMR spectrometer.



Uncountable system enables uploading data across a 96 well plate in a variety of formats including plasmid sequence maps and data.



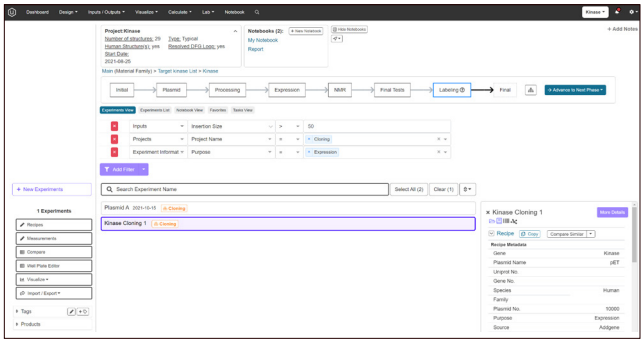
Uncountable provides a contig assembly tool for evaluating the quality of a cloning procedure.

“The Uncountable Platform is the first software I’ve worked with that can ingest and manage such a wide variety of data sources without sacrificing scientific integrity.”

Tamjeed Saleh
PhD, Lead Scientist

Uncountable’s well plating interface is used to support the high throughput screens of kinase clones. In the interface, researchers can view a sequencing quality score to judge at a glance which wells maintained the integrity of the inserted sequence. Uncountable’s engineers collaborated closely with St. Jude’s scientists to develop metrics that would save the scientists time in evaluating the sequencing results.

After verifying the integrity of the plasmid insertions, scientists can run a chromatography assay over a 96-well plate filled with different samples. Uncountable’s system lets them drag and drop the raw data folder with all of the results and quickly overlay the curves on top of the various wells.



Uncountable lets scientists quickly search and filter through all of their experiments and track progress within projects.

“Uncountable allows us to automate tasks that are normally very manual, painstaking processes to complete.”

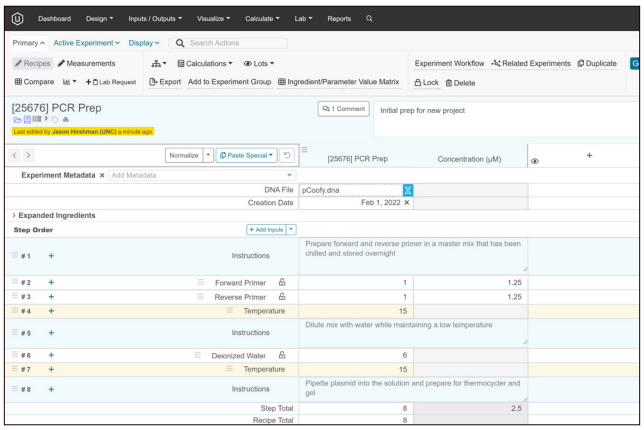
Eric Warren
PhD, Senior Researcher

Uncountable integrated tools that enable visualization of 2D NMR data when uploading information to the Uncountable Platform. With Uncountable, St. Jude's researchers can search and filter through all of the NMR results to find particular experimental conditions and view the labeled peaks corresponding to specific residue structures.

We can find any set of data that we've run over the last three years of our project through Uncountable. We're never worried about losing any of our data when a team member leaves and can continue to build upon our previous work."

Eric Warren
PhD, Senior Researcher

To aid in data entry, St. Jude administrators configured template experiments with a series of blank parameter fields to help prompt their team to enter the right details for each step in the experiment process.

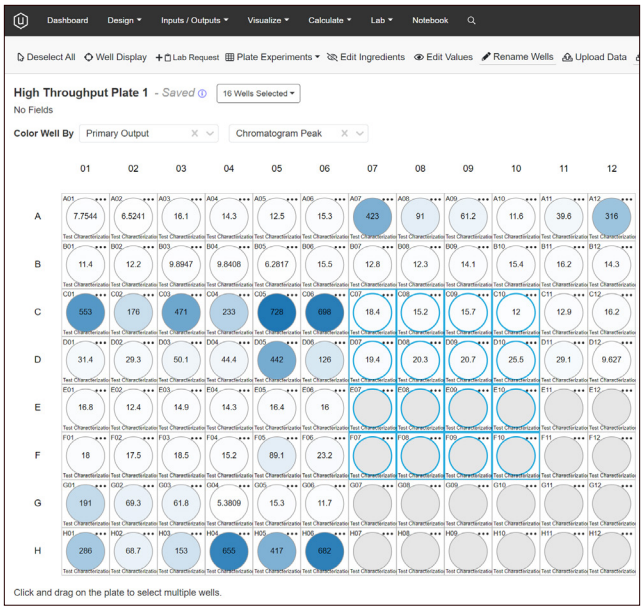


Uncountable provides a structured interface for recording experiment data and a basis for comparison across results.

For each stage of the St. Jude project, Uncountable helped to configure custom data uploaders that would ingest raw data files coming out of specialized equipment into Uncountable's structured data platform.

Uncountable also works with IT teams to try to automate the transfer of some parts of the R&D data. Uncountable sets up an SFTP transfer server to automatically intake new NMR data from an organization shared drive and imports into the Uncountable Platform.

Though they possess state-of-the-art facilities to conduct their research, the teams at St. Jude rely on their ability to manage the volume and complexity of data generated in their work. Uncountable's contributions simplify many of these detailed steps and avoid thousands of hours of work – valuable time needed for this work to go from research to a medical reality for patients.



Uncountable supports high throughput applications and overlays of result metrics across experiment setups.

For more details contact us at: info@uncountable.com