Top 25 Plain Language Summaries

Final Abstract #42

Base Editor Mediated CAR Integration with Simultaneous Multiplex Knockout for Enhanced Cancer Immunotherapies

Joseph G. Skeate[1], Nicholas J. Slipek[2], Walker S. Lahr[1], Joshua B. Krueger[3], Erin M. Stelljes[1], Alexandria K. Gilkey[1], Cara-lin Lonetree[3], Prateek P. Thenge[3], Mitchell G. Kluesner[4], Beau R. Webber[3], Branden S. Moriarity[3]
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Some cancer treatments use engineered immune cells called chimeric antigen receptor (CAR) T cells that can find and kill specific cancer cells. Previous methods used to make these cells were effective, but have a risk of developing into new cancers. In this project we used a precision genome editing technology called Base editor to make and enhance the CAR T cells so they are both safe and have greater function against their targets. We found that the more enhancements we made, the more cancer cells they killed. They also worked well in mice with a type of cancer called Burkitt's Lymphoma. Our method can make many kinds of CAR T cells with a single engineering step, allowing us to rapidly test different CAR therapies with multiple enhancements

See the oral abstract presentation Tuesday, May 7 during the Genetically Modified Immune Cells for Malignant and Non-Malignant Diseases session in room 307-308 starting at 1:30pm

Final Abstract #56

Compact Epigenetic Modulators for CRISPR Mediated Persistent Gene Activation

Giovanni Carosso[1], Robin Yeo[1], T. Blair Gainous[1], M. Zaki Jawaid[1], Xiao Yang[1], James Y. S. Kim[1], Kavita Jadhav[1], Nina Juan-Sing[1], Siddaraju Valagerehalli Boregowda[1], Vincent Cutillas[1], Lei S. Qi[2], Alexandra Collin de L'Hortet[1], Timothy P. Daley[1], **Dan Hart**[1]
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Treating diseases can benefit from turning disease genes "off". This can be achieved without mutating DNA, in a process known as epigenetic editing. However it has not been previously shown how to turn any non-disease gene "on" by epigenetic editing. In this report we show that we have found out how to do so, and that we can switch on genes for a long time, many weeks longer than has been shown before. We believe that this new finding will help us treat diseases where adding more of a good gene is beneficial, in a way that is safe and effective.

See the oral abstract presentation Wednesday, May 8 during the Epigenetic Editing and RNA Editing session in ballroom 1 starting at 1:30pm

Final Abstract #66

Comparative Analysis of Sterile Grade Filters in Adeno-Associated Virus (AAV) Manufacturing: Accelerating First-in-Human AAV Therapeutic Production with Quality by Design Principles

Morven McAlister[1], Alexander Lambropoulos[2], Limin Wang[3], Andreia Domingues[4], Melanie Sorensen[4], **Angela N. Johnson**[5,6]
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Adeno-associated viruses (AAV) are viruses that infect humans and some other animals. In the same way viruses get into the body naturally, drug makers can use these viruses as "carriers" to send useful pieces of genetic material into our bodies to treat diseases, called gene therapies. But when making these drugs, it is important to choose the right type ingredients and tools. One important tool is the filter that, just like air filters in your home, helps to remove things in the liquids uses to make gene therapies, so that the drug that goes into our bodies is clean and safe. But choosing the right filter is harder than it looks. We did 52 different tests to show just what type of filters work best. We hope this makes it easier and safer for future drug makers to choose filters and make gene therapies more quickly and at lower costs.

See the oral abstract presentation Wednesday, May 8 during the AAV Manufacturing II session in ballroom 3 starting at 1:30pm

Final Abstract #91

Anti-B7-H3 Chimeric Antigen Receptor NK Cells Suppress the Growth of Atypical Teratoid / Rhabdoid Tumor Orthotopic Xenografts

Jun Choe, Sachiv Chakravarti, Natalie Holl, Ruyan Rahnama, Megan Zinsky, Danielle Grace Jones, Stamatia Vorri, Arjun Modi, Eric H. Raabe, Challice L. Bonifant
Johns Hopkins University School of Medicine, Baltimore, MD

Atypical teratoid / rhabdoid tumors (AT/RTs) are deadly brain cancers that most commonly affect infants. Currently, there is no way to cure patients with AT/RTs that return after primary treatment. Using white blood cells as anti-cancer therapies has become a huge field in recent years, namely the use of engineered T cells to treat blood cancers. However, T cell therapies are limited by the fact that they have to be obtained directly from the patient who is receiving the treatment. Natural killer (NK) cells are a cousin of T cells, as they can carry out similar anti-cancer functions. NK cells offer the option of not having to be collected from a sick patient, rather you can collect them from a healthy donor. By engineering a chimeric antigen receptor (CAR) into healthy donor NK cells, we can make NK cells recognize and kill AT/RTs while sparing non-cancer cells in the brain

See the oral abstract presentation Wednesday, May 8 during the CAR T and Other Genetically Modified Immune Cells session in room 339-342 starting at 1:30pm

Final Abstract #101

Development of a Prime Edited CD34+ Cell Drug Product for the Treatment of P47phox Chronic Granulomatous Disease

Jack M. Heath[1], Jacob Stewart-Ornstein[1], Christa E. Osuna[1], Ahmad S. Arabiyat[1], Justin G. Tedeschi[1], Maria Collier[1], Julia Kushakji[1], Allen C. Ng[1], Marina Lilieholm[1], Alan Wilhelm[1], Katie Green[1], Hari Prasanna Subramanian[1], Sarah Trusiak[1], Katya Kosheleva[1], Matthew J. Irby[1], Rowshon Alam[1], Joseph Elich[1], Terence Ta[1], Suk See De Ravin[2], Harry L. Malech[3], Barrett J. Nehilla[1], Hetal K. Patel[1], Brian C. Beard[1], Jeremy S. Duffiled[1], **Jennifer L. Gori**[1]
[1]Prime Medicine, Inc., Cambridge, MA,[2]National Institutes of Health, NIAID, Bethesda, MD,[3]NIH/NIAID Laboratory of Clinical Immunology and Microbiology, Bethesda, MD

P47phox Chronic Granulomatous Disease (CGD) is an immune disease caused by errors in DNA that codes for part of an enzyme (NADPH oxidase) in white blood cells (WBC) needed to fight infection. CGD patients don't have functional NADPH oxidase and suffer many infections which can be lethal. A Prime Editor is an enzyme that can search for an error in DNA that causes CGD and fix it. Since stem cells make all blood cells in the body lifelong, correcting the DNA error in patient stem cells may restore NADPH oxidase in daughter WBC and prevent infection. In 80% of CGD patient stem cells treated with Prime Editor, the DNA error was corrected and the corrected cells behaved like healthy cells, producing human blood cells in a mouse model, including WBC with NADPH oxidase activity. The results show that Prime Edited stem cells may provide a potential curative treatment for CGD.

See the oral abstract presentation Wednesday, May 8 during the Base Editing and Prime Editing I session in ballroom 1 starting at 3:45pm

Final Abstract #108

Rapid Optimization of AAV Production: Integrating Custom Design of Experiment, Cutting-Edge Production and Analytical Methods in Advancement of Gene Therapies

Tricia S. Jennings, Austin E. Smith, Gretchen Smith
Advanced Medicine Partners (AMP), Durham, NC

In the past decade, scientists have made big strides in using adeno-associated viral vectors (AAV) for gene therapy, a treatment that can make a real difference for patients. This method is like a key player in the gene therapy game. Thanks to constant improvements, we're producing AAV faster and better than ever. One way we do it is by using HEK293 cells and three plasmids. This combo allows us to easily make the therapy and try out different things, like new genes of interest or delivery plasmids. But depending on how we design the plasmids and which AAV type we use, the results can vary. This affects how much we produce, how pure it is, and some unexpected losses in the final steps. We've developed a fast and effective way to test and improve drugs early on. This helps us make treatments quicker, costs less, and lowers risks.

See the oral abstract presentation Wednesday, May 8 during the AAV Analytical Methods session in ballroom 3 starting at 3:45pm

Final Abstract #120

Second Generation AAV Capsids Reprogrammed to Bind Human Transferrin Receptor are Targeted to the Brain and De-Targeted from the Liver in Human TFRC Knock-In Mice

Ken Y. Chan, Qin Huang, Shan Lou, Casey Keyes, Jason Wu, Nuria R. Botticello-Romero, Qingxia Zheng, Chin-Yen Lin, Jencilin Johnston, Allan Mills, Pamela Brauer, Gabrielle Clouse, Simon Pacouret, John W. Harvey, Thomas Beddow, Jenna K. Hurley, Isabelle G. Tobey, Megan Powell, Catherine P. Pirtle, Albert Chen, Andrew J. Barry, Fatma-Elzahraa Eid, Yujia A. Chan, Benjamin E. Deverman
Broad Institute of MIT and Harvard, Cambridge, MA

Viral vectors are reprogrammed to bind to a human receptor expressed on the blood brain-barrier as a way to deliver therapeutic genes into the brain.

See the oral abstract presentation Wednesday, May 8 during the Breaking Barriers to the CNS via AAV Capsid Engineering session in room 309-310 starting at 3:45pm

Final Abstract #128

Systematic Analysis of Primary Field Data from Biologics Therapy Regulatory Non-Approvals: Why Aren't We Talking About FDA Rejections?

Limin Wang[1], Andreia Domingues[2], Angela Johnson[3,4]
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In the United States, a government agency called Food and Drug Administration (FDA) approves each new drug, including new types of drugs called cell & gene therapies. FDA "approval" is needed before new drugs can be used for patients in regular hospitals, but what happens when FDA does not approve? And why does this happen? It turns out that sometimes FDA does not approve new cell and gene therapy drugs because of issues in human, or clinical trials, but most not approved drugs are because of issues related to how the drug is made or manufactured. To make matters more confusing, there is an easy to access FDA website for "approved" drugs, but not for those that have not been approved. To shed light on this, we researched all the "not approved" drugs from 2023, and looked at how we can better help drugs get approved in the future.

See the oral abstract presentation Wednesday, May 8 during the Strategies and Technologies for Advanced CMC session in room 314-317 starting at 3:45pm

Final Abstract #148

Phase 1/2 Trial of Combined Intrathalamic/Intracisternal/Intrathecal Gene Therapy for Tay-Sachs and Sandhoff Diseases

Terence R. Flotte[1], Allison M. Keeler-Klunk[2], Meghan Blackwood[2], Rebecca Artinian[2], Heather L. Gray-Edwards[2], Toloo Taghian[2], Oguz Cataltepe[3], Miguel Sena-Esteves[2], Florian Eichler[4]
[1]Horae Gene Therapy Center, UMass Chan Medical School, Worcester, MA,[2]UMass Chan Medical School, Worcester, MA,[3]University of Massachusetts Medical School, Worcester, MA,[4]Neurology, Massachusetts General Hospital, Boston, MA

We describe preliminary results from a trial involving nine infants and children with the severe neurologic diseases called Tay-Sachs disease and Sandhoff disease. The treatment uses a viral vector or carrier called AAV to supply a normal copy of the genes affected (HexA and HexB) to cells in the brain and spinal cord. Our trial showed that the methods used were safe and that more of the normal HexA enzyme was produced. The infants that were treated early in life were able to continue feeding by mouth longer and showed a slower rate of loss of other brain functions.

See the oral abstract presentation Thursday, May 9 during the In Vivo Gene Therapy Clinical Trials session in ballroom 1 starting at 1:30pm

Final Abstract #237

Potency Assay Enabling Both Ex Vivo and In Vivo Genome Editing Therapeutics for Sickle Cell Disease

Utku Goreke[1], Dipti H. Kamath[1], Yaw O. N. Ansong-Ansongton[1], Nathan M. Perez[1], Umut Gurkan[2], Petros Giannikopoulos[1], David N. Nguyen[1]
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It is difficult to answer how much gene-editing drug is enough to cure a disease. It depends on the patient and the strength of the drug. We could know the answer by measuring the desired cellular

function following gene editing. Sickle cell disease is a genetic disease that affects red blood cells. Authors present an assay that puts edited red blood cells to 'a stress test'. The assay imitates the capillaries outside the body to measure multiple functional properties of red blood cells. The authors can successfully edit and grow red blood cells in the lab. They also show that the devices are sensitive to the effects of disease stressors. This is an innovative approach that takes into account individual differences in patients. The assay can be universally used for diseases that affect red blood cells.

See the oral abstract presentation Friday, May 10 during the Pharmacology Toxicology Studies and Analytics Assay Development session in room 339-342 starting at 8:00am

Final Abstract #285

An Efficient Way to Generate Virus- and Factor-Free Human iPSCs Using S/MAR DNA Vectors

Anna Hartley[1], Cornelia Wincek[1], Manuela Urban[1], Alicia Roig-Merino[1], Luisa Burger[1], Zhaoyu Du[2], Tracy Li[3], Lieke Dons[3], Martin J. Hoogduijn[2], Mehrnaz Ghazvini[3], Richard P. Harbottle[1]
[1]DNA Vector Lab, German Cancer Research Centre, Heidelberg, Germany,[2]The Rotterdam Transplantation Lab, University Medical Center Rotterdam, Rotterdam, Netherlands,[3]Erasmus MC iPS Core, University Medical Center Rotterdam, Rotterdam, Netherlands

Stem cells are special cells that can develop into any type of cell in the body. Normally, mature cells do not have the ability to make cells of other types. However, we can force mature cells to become stem cells simply by introducing four proteins, which we call "reprogramming". Reprogrammed cells offer immense potential in medicine, allowing us to make any cell type from anyone's cells. They are normally made using viruses, which reduces their quality and could cause them to become cancerous. We have developed a new type of DNA called S/MAR vectors, which we have used both to reprogram stem cells and to modify them as a proof of concept for gene therapy, without any viruses. Our stem cells behave the same way as stem cells made with viruses, and we are currently proving that they are safer and of better quality than virus-made stem cells.

See the oral abstract presentation Friday, May 10 during the Novel Production Platforms session in ballroom 2 starting at 3:45pm

Final Abstract #381

Characterization of Guide RNA Site Consistency Across Ancestries and the Potential for Off-Target Editing with the Clinical-Stage Base Editing Medicine, VERVE-101

Alexandra C. Chadwick, Jamie DeNizio, Sara Garcia, Anthony Federico, Manashree Damle, Hui-Ting Hsu, Estela Shabani, Daniel Weiner, Amit V. Khera, **Joseph Biedenkapp**, Sekar Kathiresan, Troy Lister, Andrew M. Bellinger
Verve Therapeutics, Boston, MA

Gene editors are a new type of medicine that work by making DNA changes in genes at specific locations in the body. VERVE-101 is a gene editor that is designed to make a permanent change in DNA in the liver to turn off a cholesterol raising gene and reduce harmful cholesterol after a single treatment. It is being studied in an ongoing clinical trial. We looked at the DNA of thousands of people from around the world and found VERVE-101 would be expected to work the same way in people from diverse ancestral backgrounds. We also looked to see if VERVE-101 was making any unintended DNA changes in other genes or in places other than the liver. We found that VERVE-101 was very specific to the cholesterol raising gene in the liver and that the risk of it making unwanted DNA changes is expected to be very low.

See the oral abstract presentation Saturday, May 11 during the Base Editing and Prime Editing II session in ballroom 3 starting at 10:15am

Final Abstract #410

Machine-Designed Synthetic 3' UTRs Significantly Increase mRNA Stability

Elise D. Flynn[1,2], Görkem Garipler[1], Emily Hoelzli[1], Uri Laserson[1], JB Michel[1], Alyssa Morrow[1], Meimei Shan[1], Ashley Thornal[1]
[1]Patch Biosciences, New York, NY,[2]Authors are displayed alphabetically, New York, NY

The COVID-19 mRNA vaccines use messenger RNA (mRNA) molecules to improve immunity to COVID-19. Many other drugs are being designed using mRNA, but mRNA molecules are unstable and degrade quickly once they reach the cell. We designed more stable mRNA molecules by changing a part of the mRNA molecule called the 3' untranslated region (UTR). We tested hundreds of thousands of 3'UTR sequences in cells and measured how stable

they were, and we used machine learning models to figure out what makes the sequences more or less stable. We then designed stable 3'UTR sequences that increased protein production over time when tested in mice. These sequences can be used in mRNA drugs to improve their efficiency.

See the oral abstract presentation Saturday, May 11 during the Vector Product Engineering, Development, and Manufacturing (excluding AAV) session in room 314-317 starting at 10:15am

Final Abstract #421

CRISPR-Cas9 for Selective Targeting of Somatic Mutations in Pancreatic Cancers: A Novel Cancer Gene Therapy Approach

Selina Shiqing K. Teh[1], Kirsten Bowland[1], Alexis Bennett[1], Eitan Halper-Stromberg[1], Alyza Skaist[2], Jingyao Ma[3], Yining Zhu[3], Sarah Wheelan[2], Hai-Quan Mao[3], Nicholas J. Roberts[1], James R. Eshleman[1]

[1]Department of Pathology, Johns Hopkins University School of Medicine, Baltimore, MD,[2]Department of Oncology, Johns Hopkins University School of Medicine, Baltimore, MD,[3]Institute of NanoBioTechnology, Johns Hopkins University, Baltimore, MD

Cancers are caused by changes in DNA that lead to cells dividing uncontrollably, while chemotherapy and radiation therapy work by damaging DNA in cancer cells to kill them or slow their growth. These treatments, however, also affect DNA in some healthy cells, resulting in side effects such as hair loss. This brings up the question: how can we damage the cancer DNA without affecting the healthy cells? CRISPR-Cas9, a bacterial immune system to defend against virus, can be adapted to attack cancers. It functions as DNA scissors equipped with a guide which directs its scissors to a specific DNA location for cutting. We designed CRISPR-Cas9 to cut at novel changes in cancer DNA that were not found in healthy cells, thus damaging the cancer DNA only. We were able to achieve significant and selective target cancer killing, and are developing it as a new form of cancer gene therapy.

See the oral abstract presentation Saturday, May 11 during the Targeted Gene and Cell Therapy II session in room 318-323 starting at 10:15am

Final Abstract #499

Rational Design of AAV-rh74, AAV3B, and AAV8 with Limited Liver Targeting

Christopher Chan, **Kathryn K. Harris**, Sergei Zolotukhin, Geoffrey D. Keeler

Department of Pediatrics, University of Florida, Gainesville, FL

One of the liver's important functions is removing toxins such as alcohol from the blood. The liver also breaks down many medications that travel through the bloodstream. If a medicine needs to reach another part of your body to treat a disease, your doctor might prescribe a larger dose to make up for what the liver removes. This larger dose could contribute to negative side effects and is a current problem for gene therapies.

rAAV is a type of gene therapy used to deliver healthy genes to diseased organs in the body. We identified a method to prevent the liver from uptaking rAAV from the bloodstream. This finding could help decrease the dose needed to treat certain genetic diseases and reduce negative side effects for patients.

See the poster abstract presentation Wednesday, May 8 in the Exhibit Hall from 12:00pm to 7:00pm

Final Abstract #521

Enhancing Viral Vector Production Through Genetic Engineering of Host Cells

Maximilien Lopes, Jean-Claude Twizere

Viral Interactomes Networks, University of Liege, Liege, Belgium

Today, advanced medical treatments, especially for rare diseases, often involve complex substances like proteins, viral vectors, and vaccines. To obtain these therapeutics, cells are used and what they produce is then collected. Making these substances is a bit tricky because they need some special features only found in certain cells. The main challenge is that making enough of these substances is very costly. Many have tried improving the processes to make them, but it's still a problem to overcome.

To make these treatments more affordable, we're taking a different approach. Instead of tweaking the production process, we are working on enhancing the cells themselves. We're changing their genes to make them produce more of the substances we

need. Doing so, the cells can produce up to seven times more than before.

See the poster abstract presentation Wednesday, May 8 in the Exhibit Hall from 12:00pm to 7:00pm

Final Abstract #543

Quantitative Analysis of Capsid Loading in Gene Therapies with High-Precision Tunable Laser Spectroscopy

Bryan Hassell
Nirrin Technologies, Billerica, MA

In gene therapy, we need to know how many of our tiny delivery packages (capsids) are full versus empty, as it's key for safe and effective treatments. Usually, this measuring takes a lot of time and effort and isn't very precise with raw samples. Our new laser tool makes this much easier and more accurate. It uses light to quickly tell the difference between full and empty capsids, even in complex mixtures. This helps scientists and companies make faster and better decisions when creating gene therapies. Our presentation will explain how this tool works, show it in action with real samples, and highlight its benefits over older methods. We believe our tool can greatly improve how we analyze gene therapy materials.

See the poster abstract presentation Wednesday, May 8 in the Exhibit Hall from 12:00pm to 7:00pm

Final Abstract #672

Exon Reframing by Prime Editors Restores Dystrophin Expression and Function in DMD Patient Cardiomyocytes

Michelle O'Connor[1], Sascha Hernandez[1], David Waterman[1], Serge Kyrychenko[1], Naqi Haider[2], Vivian Choi[1], John Stiller[1], Katya Kosheleva[3], Matthew Malloy[1], Andrew V. Anzalone[4], Jeremy Duffield[1]
[1]Prime Medicine, Cambridge, MA,[2]Prime Medicine, Arlington, MA,[3]Prime Medicine, Somerville, MA,[4]Broad Institute, Cambridge, MA

Prime Editing is a very precise method of editing genes that can be thought of as a gene word processor and could be used to correct a patient's defective genes with a single treatment. Duchenne muscular dystrophy (DMD) is a genetic disorder caused by mutations in the DMD gene, which codes for a muscle protein called dystrophin. DMD gene mutations affect how the cell can read the gene and result in a non-functioning dystrophin protein. Our approach uses Prime Editors to rewrite a small part of the DMD gene, allowing the cell to read the gene correctly. Applying this strategy for 3 common DMD mutations, we demonstrated restoration of dystrophin protein and function using heart cells from DMD patients. The corrected patient cells behave like cells from healthy individuals. This study highlights the potential of Prime Editors to help a large number of DMD patients with unmet medical need.

See the poster abstract presentation Wednesday, May 8 in the Exhibit Hall from 12:00pm to 7:00pm

Final Abstract #707

A Novel Mutation-Agnostic Gene Therapy Using AAV-Delivered Heterologous Expression of Engineered Microbial Mechanosensitive Channel in Animal Model of Ocular Hypertension

Adnan Dibas, Lucero Garcia, Megan Aldape, Sanghoon Kim, Subrata Batabyal, Mohanty Samarendra
Nanoscope Technologies, Bedford, TX

Glaucoma patients have low adherence to use of eye drops. This will be even worse as they age. There is an urgent need for therapy that lasts for years. Using a novel channel that senses pressure, we successfully introduced it in a mouse model of glaucoma and lowered pressure for more than 3 months after a single injection. Such approach will greatly help glaucoma subjects.

See the poster abstract presentation Wednesday, May 8 in the Exhibit Hall from 12:00pm to 7:00pm

Final Abstract #1016

Two Years Study of Safety and Efficacy of AAV Vaccine in a Preclinical Spontaneous Canine Model of Oral Melanoma

Ester Molina[1], Caitlin Yung[2], Colin Caine[1], Hisae Yoshitomi Kuoch[3], Karina Krotova[1], Antonella Borgatti[2], George Aslanidi[4]
[1]The Hormel Institute, Austin, MN,[2]University of Minnesota, Minneapolis, MN,[3]Hormel Institute University of Minnesota, Austin, MN,[4]University of Minnesota, Austin, MN

Oral melanoma (OM) is an aggressive disease. The main cause of death is due to metastasis in the lungs or lymph nodes. Canine OM is similar to human. The

animals that do not respond to the treatment develop metastasis, with devastating consequences. There have been some attempts of immunotherapy treatments with poor results so far for both dogs and humans. Therefore, new approaches to fight this aggressive disease are urgently required. In our lab we have been working with viruses for many years trying to improve their natural abilities and make them safer and efficient for clinical purposes. Our vaccine has proved to be safe in sick dogs with OM. All the animals developed an immune response to a lower or higher degree. These observations lead us to the conclusion that our vaccine is a potential treatment that is worthy to try in human clinical trials in the future.

See the poster abstract presentation Thursday, May 9 in the Exhibit Hall from 12:00pm to 7:00pm

Final Abstract #1111

Advanced Therapeutic Intervention for GBA1-Associated Parkinson's Disease: Preclinical Evaluation of Efficacy and Safety of LY-N001

Yingying Cai, Guofang Yan, Xiaojing Sheng, Yixiong Chen, **Qing Lin**
Dept. of Discovery, Lingyi Biotech Co., Ltd., Shanghai, China

LY-N001 is a new treatment designed to tackle Parkinson's Disease, specifically for patients with a certain gene issue (GBA1 gene). Imagine it as a special tool that fixes this gene problem, helping the brain to work better. Scientists tested it in mice and saw encouraging results: the mice's brain health improved, and they moved more easily. While it's still early days, LY-N001 shows promise in bringing new hope to those affected by Parkinson's Disease.

See the poster abstract presentation Thursday, May 9 in the Exhibit Hall from 12:00pm to 7:00pm

Final Abstract #1202

Peptide-Assisted Tethering of DNA Repair Effectors to Cas9 for Precise Genome Editing

Sibtain Haider[1], Ali Faiq[1], Toni Cathomen[2], Claudio Mussolino[2]
[1]Institute for Gene Therapy, Freiburg, Germany,[2]Medical Center - University of Freiburg, Freiburg, Germany

The human body is made up of tiny building blocks called cells. Inside each cell, there's a set of instructions written in a special code called DNA. These instructions are organized into genes, each with its own specific function. Imagine a disease called Fanconi Anemia, where a gene responsible for DNA repair is not working right. Now the body can't fix damage like it normally would. We use Cas9, a small scissors-like molecular tool to cut out the wrong DNA code and replace it with the correct one. since the natural repair process is faulty, we provide the necessary repair factors along with Cas9 to Improve its efficiency. we attach small coils with Cas9 and the repair factors to make sure they team up effectively, just like magnets pulling together. We believe this approach can also be a game-changer for solving problems in many other diseases.

See the poster abstract presentation Thursday, May 9 in the Exhibit Hall from 12:00pm to 7:00pm

Final Abstract #1266

Development of Immunotherapies for Osteosarcoma

Theresa Higgins[1], Daniel Patton[1], Timothy L. Eller[1], Isabella Shimko-Lofano[1], Payal Agarwal[2]
[1]Scott Ritchey Research Center, Auburn University, Auburn, AL,[2]Scott Ritchey Research Center, Auburn University, Auburn University, AL

One of the major issues with cancer is that it is a disease made up of the host's own cells. As such, their immune system does not naturally recognize it as a threat. To combat this, we are creating immunotherapies for osteosarcoma, an aggressive and highly metastatic bone cancer. We do this in two ways. First, by arming the immune system with a specialized virus that only replicates in and kills cancer cells, as well as secretes a protein that will help stimulate the immune system. Second, we are modifying T cells by adding a receptor that allows them to specifically target and kill cancer cells.

See the poster abstract presentation Thursday, May 9 in the Exhibit Hall from 12:00pm to 7:00pm

Final Abstract #1663

Durable *HTT* Silencing Using Non-Evolved dCas9 Epigenome Editors in Patient-Derived Cells

Jennifer Waldo[1,2], Julian A. N. M. Halmai[1,2], Ankita Singh[1,2], Maria N. Florendo[1,2], Jan A. Nolta[2], Kyle D. Fink[1,2]
[1]Ctr. for Interventional Genetics, MIND Institute, Department of Neurology, UC Davis Medical Center, Sacramento, CA,[2]Stem Cell Program, Gene Therapy Center, Institute for Regenerative Cures, UC Davis Medical Center, Sacramento, CA

Huntington's Disease (HD) is a fatal brain disorder that is caused by a mistake in the DNA, which are the instructions that tell each cell how to function. When the cell doesn't need certain instructions, it can turn them on or off, like a light switch. Our goal is to develop treatments for HD using the cell's ability to choose what instructions are on or off. We can use tools that target specific pieces of DNA and turn them off so the cell no longer makes a bad product. We used these tools to turn off the bad instructions that cause HD in patient cells and saw that these cells functioned more like healthy cells. We hope our new tools will allow for future treatment of HD and other devastating genetic disorders that have no treatments or cures.

See the poster abstract presentation Friday, May 10 in the Exhibit Hall from 12:00pm to 7:00pm

Final Abstract #1678

Targeted Insertion of HLA-E at the B2M Locus of mRNA-Reprogrammed iPSCs Facilitates the Development of Allogeneic Cell Therapies with Enhanced Safety Features

Elizabeth Belcher[1], Raven Dance Hinkel[1], Christopher B. Rohde[2], Matthew Angel[2], Kyle M. Garland[1]
[1]Eterna Therapeutics Inc., Cambridge, MA,[2]Factor Bioscience Inc., Cambridge, MA

Imagine you get a donation of someone else's cells to treat your disease, but your body recognizes these cells as foreign and tries to remove them. This prevents the treatment from working, so how do we stop that? If you think of your body as a house, turning off the lights hides donor cells from the immune system. But since the lights are off, the donor cells are bumping into everything and making a lot of noise, alerting other parts of the immune system. To fix this, we keep the lights off and give the donor cells night vision goggles. This hides them from your immune system, allowing them to stay around longer to treat your disease. We have made these two changes to our stem cells, which can be turned into any type of cell, so we can use our donor cells to safely treat many different diseases.

See the poster abstract presentation Friday, May 10 in the Exhibit Hall from 12:00pm to 7:00pm