



## PureTech's Alivio Technology Published in Nature Communications

April 4, 2018

*Study demonstrates application of inflammation-responsive technology platform for the treatment of inflammatory diseases*

PureTech Health plc (LSE: PRTC) ("PureTech Health"), an advanced, clinical-stage biopharmaceutical company, announced today that a preclinical study of the Alivio inflammation-responsive technology has been published in one of the leading scientific journals, *Nature Communications*.

Alivio, an affiliate of PureTech Health, reported that an immunomodulatory drug, administered locally using its inflammation-responsive technology, substantially reduced measures of arthritis disease activity. By the last day of the study (day 14), the Alivio technology had reduced nearly all of the inflammation in the affected tissue, with a 5.7-fold improvement in the clinical score vs control, as compared to only 1.4-fold for the free drug. These findings further support Alivio's proprietary therapeutics platform and provide proof-of-concept for the potential application of the technology in inflammatory arthritis.

"The data published in *Nature Communications* demonstrate the broad potential and power of our inflammation-responsive technology for treating chronic and acute inflammatory diseases in a localised manner compared to the current treatment options," said Eric Elenko, Chief of Research & Strategy at PureTech Health. "We look forward to building on these positive results as we advance this technology into the clinic."

The full text of the announcement from Alivio is as follows:

### **Alivio Technology for Treating Inflammatory Diseases via Targeted Disease Immunomodulation Published in *Nature Communications***

*Proof-of-concept preclinical study supports feasibility of Alivio's technology platform as a potential new treatment approach for inflammatory arthritis*

**Boston, Massachusetts, April 4, 2018** — Alivio Therapeutics, a biotechnology company developing therapies to treat inflammatory disorders via targeted disease immunomodulation and an affiliate of PureTech Health plc (LSE: PRTC), today announced that *Nature Communications* has published results from a preclinical study demonstrating that an immunomodulatory drug, administered locally using Alivio's inflammation-responsive technology, substantially reduced measures of arthritis disease activity. These findings further support Alivio's therapeutics platform and provide proof-of-concept for the potential application of the technology in inflammatory arthritis. Alivio has an exclusive license to the underlying proprietary platform technology from Brigham and Women's Hospital (BWH), Harvard Medical School (HMS) and the Massachusetts Institute of Technology (MIT).

The study demonstrated that an immunomodulatory agent, when combined with the Alivio technology, was released at the site of inflammation based on the degree of inflammation in the joints during arthritis flares. By the last day of the study (day 14), the Alivio technology had reduced nearly all of the inflammation in the affected tissue, with a 5.7-fold improvement in the clinical score vs control, as compared to only 1.4-fold for the free drug. The Alivio technology is designed to modulate the immune system locally in diseased tissue in a targeted manner by releasing greater amounts of therapeutics proportional to the severity of inflammation. In diseased joints, the Alivio technology prevents the rapid clearance commonly seen with conventional drugs introduced to the intra-articular space.

"The data show that the material responds dynamically to inflammatory flare severity. This new approach achieved therapeutic efficacy without side effects and has the potential to reduce the need for frequent dosing across multiple inflammatory disorders, as demonstrated by our previously published data," said Alivio Co-founder Jeff Karp, PhD, Principal Investigator at BWH and a professor at HMS; Principal faculty at the Harvard Stem Cell Institute; and affiliate faculty at Harvard-MIT's Division of Health Sciences and Technology and the Broad Institute of MIT and Harvard.

Alivio is applying its technology to administer therapeutics selectively to the sites of inflammation across a variety of diseases, including inflammatory bowel disease, arthritis and pain. In July 2017, Alivio presented data showing durable pain control with its technology in a preclinical Interstitial Cystitis/Bladder Pain Syndrome (IC/BPS) model that lasted at least 12 times longer than lidocaine at a comparable dose (ALV-107 16 mg/kg, conventional lidocaine 16 mg/kg).

### **About Alivio**

Alivio Therapeutics, an affiliate of PureTech Health (PRTC.L), is pioneering targeted disease immunomodulation as a novel strategy to treat a range of chronic and acute inflammatory disorders. Targeted disease immunomodulation involves tuning the immune system exclusively at the site of disease in the body, with minimal impact on the rest of the immune system. This long sought-after approach has potential to treat a range of chronic and acute inflammatory disorders including ones that would otherwise be difficult to treat. Alivio's proprietary Inflammation-Targeted Technology, based on the research of Dr Karp and Dr Robert Langer, David H. Koch Institute Professor at MIT, is the first technology to reproducibly show the ability to target immunomodulatory compounds to inflamed tissue, which can lead to dramatic improvements in treatment efficacy with major reductions in systemic effects. The platform has been validated in multiple labs and in eight different animal models of inflammation where the inflammation occurred in different parts of the body (e.g., the GI system, the bladder, joints, skin, etc.). The technology could potentially be used with a variety of medications (e.g., small molecules, peptides, proteins and nucleic acids) to address the dozens of conditions where inflammation is a central part of the underlying disease pathology, but where targeted and effective treatment options are lacking.

Alivio is developing its proprietary technology in collaboration with several of the world's leading experts in biomaterials and immunology. Expert advisors include: [Jeff Karp, PhD](#), Professor of Medicine at Brigham & Women's Hospital and Alivio co-founder; [Robert Langer, ScD](#), Co-Alivio Founder and Non-Executive Director at PureTech Health and David H. Koch Institute Professor at MIT; Michael B. Brenner, MD, Chief of the Division of Rheumatology, Immunology and Allergy at BWH; [Ulrich H. von Andrian, MD, PhD](#), Mallinckrodt Professor of Immunopathology at Harvard Medical

School; and [Ralph Weissleder, MD, PhD](#), Director of the Center for Systems Biology at Massachusetts General Hospital.

### **About PureTech Health**

PureTech Health (PRTC.L) is an advanced, clinical-stage biopharmaceutical company developing novel medicines targeting serious diseases that result from dysfunctions in the nervous, immune, and gastrointestinal systems (brain-immune-gut or the “BIG” axis), which together represent the adaptive human systems. PureTech Health is at the forefront of understanding and addressing the biological processes and crosstalk associated with the BIG axis. By harnessing this emerging field of human biology, PureTech Health is pioneering new categories of medicine with the potential to have great impact on people with serious diseases. PureTech Health is advancing a rich pipeline of innovative therapies that includes two pivotal stage programs, multiple human proof-of-concept studies and a number of early clinical and pre-clinical programs. PureTech's research and development pipeline has been advanced in collaboration with some of the world's leading scientific experts, who along with PureTech's team of biopharma pioneers, entrepreneurs and seasoned Board, identify, invent, and clinically de-risk new medicines. With this experienced team pursuing cutting edge science, PureTech Health is building the biopharma company of the future focused on improving and extending the lives of people with serious disease. For more information, visit [www.puretechhealth.com](http://www.puretechhealth.com) or connect with us on Twitter [@puretech](https://twitter.com/puretech).