New Genetic Data from Regeneron and GSK on 50,000 UK Biobank Participants Made Available to Global Health Research Community

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All sequenced data linked to detailed health-related records, creating first widely available 'Big Data' resource of its kind

Represents first tranche to be released; data from all 500,000 UK Biobank participants will ultimately be made available via larger biopharma consortium effort

Regeneron (NASDAQ: **REGN**) and UK Biobank announced today that a vast tranche of new human sequencing data is now available to health researchers, offering an unprecedented 'Big Data' resource to enhance understanding of human biology and aid in therapeutic discovery.

The exome sequence data of 50,000 UK Biobank participants were generated at the Regeneron Genetics Center (RGC) through a collaboration between UK Biobank, Regeneron and GlaxoSmithKline (GSK) and are linked to detailed de-identified health records, imaging and other health-related data. Regeneron is also leading a consortium of biopharma companies (including Abbvie, Alnylam, AstraZeneca, Bristol-Myers Squibb, Biogen, Pfizer and Takeda) to complete exome sequencing of the remaining 450,000 UK Biobank participants by 2020.

Consistent with the founding principles of UK Biobank, the first tranche of data has now been incorporated back into the UK Biobank resource for the global health research community to use. It follows a brief exclusive research period for Regeneron and GSK. Additional tranches of data will similarly be released over the next two years. All sequencing and analyses activities are undertaken on a de-identified basis, with the utmost consideration and respect for participant privacy and confidentiality principles.

This major enhancement to UK Biobank would have been unimaginable when the study began recruiting participants in 2006 and makes it one of the most important studies of population health in the world. It represents huge leverage of the public and charity investment that has supported UK Biobank up to this point; the costs of such a project would have been prohibitive had UK Biobank had to raise the funding itself.

"We believe this is the largest open access resource of exome sequence data linked to robust health records in the world – and this is just the beginning," said Aris Baras, MD, Senior Vice President and Head of the RGC. "There is so much actionable information in this resource that can be utilized by scientific minds around the globe. We are hard at work mining the data for novel findings that will accelerate science, innovative new medicines and improved patient care, and we are excited to have others join us in this important quest."

"We strongly support the UK's life sciences strategy, and this is a great example of what can be achieved by all parts of the sector working together to make sure the UK remains at the cutting-edge of research," said Tony Wood, Senior Vice President of Medicinal Science and Technology at GSK. "Genetics is playing an increasingly important role in research, and by generating and now integrating these exome data, UK Biobank has some of the richest health and genetics data available for use by the broader scientific community to enhance their understanding and research effort. We expect this will ultimately lead to more scientific breakthroughs that can improve health."

The exome makes up the 1-2 percent of a human genome where the actual protein-coding genes are contained. It is this area that scientists believe has most relevance for discovering genetic variants that may inform the discovery and development of new and improved medicines. The exome sequencing work supports other UK Biobank genetics analyses under way, including whole genome sequencing of 50,000 participants funded by UK Research and Innovation as part of the Industrial Strategy Challenge Fund.

Researchers from Regeneron and GSK also released a preprint of a manuscript describing their findings from examination of the first 50,000 exomes. Key findings included novel loss of function associations with large effects on disease risk, including between *PIEZO1* and varicose veins, *MEPE* and bone mineral density and osteoporosis, *COL6A1* and ocular traits, and *IQGAP2* and *GMPR* associated with blood cell traits. The researchers also explored population-based genetic risk for a number of important diseases, such as *BRCA1*- and *BRCA2*-associated cancers.

Regeneron and GSK have significant expertise in genomics. The sequencing was performed by the RGC, one of the world's largest human genetics sequencing and research programs. The RGC is currently sequencing at a rate of 500,000 exomes per year, and Regeneron has advanced multiple new targets and development programs based on its genetics discoveries. GSK is also increasingly incorporating the almost daily advances in genetics and genomics into its drug research programs, forming collaborations and working closely with other world-leading organizations.

"UK Biobank was established to do science in new ways, and it is very pleasing to see industry and academia tackling health research together," said Professor Fiona Watt, Executive Chair of the UK Medical Research, which has funded UK Biobank since its inception and continues to support enhancement activities. "Industry has led the way on this exome sequencing project, and the fruits of that work mean UK Biobank can now deliver important genetic data that would otherwise not be available to researchers."

"Today's announcement proves the immense value of the UK Biobank and we look forward to seeing many new collaborations between UK Biobank, industry and academia on the back of this new data being released," said Sara Marshall, Head of Clinical Research & Physiological Sciences at the Wellcome Trust, which also funds UK Biobank. "The success of UK Biobank is thanks to the 500,000 people who have generously agreed to have their lives studied for years."

"We are excited about the possibilities of letting loose the imaginations of scientists from around the world on these large-scale genomic data linked to so much detailed information related to health in the 500,000 UK Biobank participants," said Professor Sir Rory Collins, UK Biobank's Principal Investigator, who encouraged approved researchers to use the data.

UK Biobank has also updated a range of other health information on its 500,000 participants. This includes updates of hospital, cancer and death data, infectious disease data (including human immunodeficiency virus, human papillomavirus and chlamydia) and blood biomarkers. New disease-related algorithms are provided on asthma, kidney disease, dementia and Parkinson's disease, and the stroke and heart attack algorithms have been updated. Researchers can find more details on how to access the data at https://bbams.ndph.ox.ac.uk/ams/.

About UK Biobank
UK Biobank is the most comprehensive resource of its kind in the world. Its 500,000 participants have provided information about their health, well-being and lifestyle, as well as blood and other biological samples for long-term storage and analysis. In addition, they have agreed to have their health followed through medical records for many years. Scientists from around the world are able to use anonymized data from the resource for research intended to improve the prevention and treatment of a wide range of common disorders.

UK Biobank is funded primarily by the UK Medical Research Council and the Wellcome Trust. For more information, visit www.ukbiobank.ac.uk.

About Regeneron
Regeneron (NASDAQ: REGN) is a leading biotechnology company that invents life-transforming medicines for people with serious diseases. Founded and led for 30 years by physician-scientists, our unique ability to repeatedly and consistently translate science into medicine has led to seven FDA-approved treatments and numerous product candidates in development, all of which were homegrown in our laboratories. Our medicines and pipeline are designed to help patients with eye diseases, allergic and inflammatory diseases, cancer, cardiovascular and metabolic diseases, neuromuscular diseases, infectious diseases and rare diseases.

Regeneron is accelerating and improving the traditional drug development process through our proprietary *VelociSuite*® technologies, including *VelocImmune*® which produces optimized fully-human antibodies, and ambitious initiatives such as the Regeneron Genetics Center, which is conducting one of the largest genetics sequencing efforts in the world.

For additional information about the company, please visit www.regeneron.com or follow @Regeneron on Twitter.

Regeneron Forward-Looking Statements and Use of Digital Media
This press release includes forward-looking statements that involve risks and uncertainties relating to future events and the future performance of Regeneron Pharmaceuticals, Inc. ("Regeneron" or the "Company"), and actual events or results may differ materially from these forward-looking statements. Words such as "anticipate," "expect," "intend," "plan," "believe," "seek," "estimate," variations of such words, and similar expressions are intended to identify such forward-looking statements, although not all forward-looking statements contain these identifying words. These statements concern, and these risks and uncertainties include, among others, the nature, timing, and possible success and therapeutic applications of Regeneron's products, product candidates, and research and clinical programs now underway or planned, including without limitation the use of human genetics in Regeneron's research programs; the extent to which the results from Regeneron's research programs or preclinical testing may lead to advancement of product candidates to clinical trials or therapeutic applications; unforeseen safety issues resulting from the administration of products and product candidates in patients, including serious complications or side effects in connection with the use of Regeneron's product candidates in clinical trials; the likelihood and timing of possible regulatory approval and commercial launch of Regeneron's late-stage product candidates and new indications for marketed products; the likelihood and timing of achieving any of the anticipated milestones described in this press release; the extent to which the results from the research and development programs conducted by Regeneron or its collaborators may be replicated in other studies and lead to therapeutic applications; ongoing regulatory obligations and oversight impacting Regeneron's marketed products, research and clinical programs, and business, including those relating to patient privacy; determinations by regulatory and administrative governmental authorities which may delay or restrict Regeneron's ability to continue to develop or commercialize Regeneron's products and product candidates; competing drugs and product candidates that may be superior to Regeneron's products and product candidates; uncertainty of market acceptance and commercial success of Regeneron's products and product candidates and the impact of studies (whether conducted by Regeneron or others and whether mandated or voluntary) on the commercial success of Regeneron's products and product candidates; the availability and extent of reimbursement of the Company's products from third-party payers, including private payer healthcare and insurance programs, health maintenance organizations, pharmacy benefit management companies, and government programs such as Medicare and Medicaid; coverage and reimbursement determinations by such payers and new policies and procedures adopted by such payers; the ability of Regeneron to manufacture and manage supply chains for multiple products and product candidates; the ability of Regeneron's collaborators, suppliers, or other third parties to perform filling, finishing, packaging, labeling, distribution, and other steps related to Regeneron's products and product candidates; unanticipated expenses; the costs of developing, producing, and selling products; the ability of Regeneron to meet any of its sales or other financial projections or guidance and changes to the assumptions underlying those projections or guidance; risks associated with intellectual property of other parties and pending or future litigation relating thereto, including without limitation the patent litigation proceedings relating to EYLEA® (aflibercept) Injection, Dupixent® (dupilumab) Injection, and Praluent® (alirocumab) Injection, the ultimate outcome of any such litigation proceeding, and the impact any of the foregoing may have on Regeneron's business, prospects, operating results, and financial condition; and the potential for any license or collaboration agreement, including Regeneron's agreements with Sanofi, Bayer, and Teva Pharmaceutical Industries Ltd. (or their respective affiliated companies, as applicable), to be cancelled or terminated without any further product success. A more complete description of these and other material risks can be found in Regeneron's filings with the U.S. Securities and Exchange Commission, including its Form 10-K for the fiscal year ended December 31, 2018 in the section thereof captioned "Item 1A. Risk Factors." Any forward-looking statements are made based on management's current beliefs and judgment, and the reader is cautioned not to rely on any forward-looking statements made by Regeneron. Regeneron does not undertake any obligation to update publicly any forward-looking statement, including without limitation any financial projection or guidance, whether as a result of new information, future events, or otherwise.

Regeneron uses its media and investor relations website and social media outlets to publish important information about the Company, including information that may be deemed material to investors. Financial and other information about Regeneron is routinely posted and is accessible on Regeneron's media and investor relations website (http://newsroom.regeneron.com) and its Twitter feed (http://twitter.com/regeneron).

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