Itepekimab Met Primary Endpoint in One of Two Chronic Obstructive Pulmonary Disease (COPD) Phase 3 Trials

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AERIFY-1 trial met the primary endpoint of a statistically significant reduction in moderate or severe exacerbations in former smokers regardless of eosinophilic phenotype and provided a clinically meaningful benefit

AERIFY-2, a second Phase 3 trial, did not meet the primary endpoint despite a benefit seen earlier in the trial

Itepekimab was generally well tolerated in both AERIFY-1 and AERIFY-2, with safety consistent with prior clinical trials

Regeneron and Sanofi are assessing the data and will discuss next steps with regulatory authorities

TARRYTOWN, N.Y. and PARIS, May 30, 2025 (GLOBE NEWSWIRE) -- Regeneron Pharmaceuticals, Inc. (NASDAQ: REGN) and Sanofi today announced that a Phase 3 trial, AERIFY-1, evaluating the investigational use of itepekimab in adults who were former smokers with inadequately controlled chronic obstructive pulmonary disease (COPD) met the primary endpoint of significantly reducing moderate or severe acute exacerbations by 27% compared to placebo at week 52, a clinically meaningful benefit. A second Phase 3 trial, AERIFY-2, did not meet the same primary endpoint, although a benefit was seen earlier in the trial.

In the trials, patients were randomized to receive itepekimab every two weeks (AERIFY-1: n=375; AERIFY-2: n=326), every four weeks (AERIFY-1: n=377; AERIFY-2: n=303), or placebo (AERIFY-1: n=375; AERIFY-2: n=324), which was added to inhaled triple or double standard-of-care therapy. The primary endpoint for AERIFY-1 and AERIFY-2 was the reduction in the annualized rate of acute moderate or severe COPD exacerbations with itepekimab treatment.

The table below summarizes the reductions in moderate or severe exacerbations (itepekimab compared to placebo) through weeks 24 and 52:

	AERIFY-1		**AERIFY-2**	
	Week 24	*Week 52*	*Week 24*	*Week 52*
Itepekimab every two weeks	30%	27%[a]	18%	2%
Itepekimab every four weeks	34%	21%[a]	21%	12%

[a] Formal significance testing was only performed at 52 weeks in the Phase 3 trials, with significance achieved for both the every-two-week arm and every-four-week arm in AERIFY-1.

The total number of exacerbations was lower than prospectively anticipated, decreasing the power of both trials. Enrollment largely occurred during the time of the global COVID-19 pandemic, which could have contributed to the lower overall exacerbation rates.

The safety profile of itepekimab was consistent across dosing regimens, and adverse events (AEs) were generally comparable between treatment and placebo groups. In AERIFY-1, the overall rates of AEs were 67% and 68% for itepekimab every two weeks and every four weeks, respectively, compared to 68% for placebo. In AERIFY-2, the overall rates of AEs were 64% and 71% for itepekimab every two weeks and every four weeks, respectively, compared to 64% for placebo. In AERIFY-1, the rate of serious infections was 7% for each itepekimab arm, compared to 10% for placebo. In AERIFY-2, the rate of serious infections was 10% and 7% for itepekimab every two weeks and every four weeks, respectively, compared to 7% for placebo. AEs leading to death were 1% for each itepekimab arm compared to 2% for placebo in AERIFY-1, and 3% for each itepekimab arm compared to 2% for placebo in AERIFY-2. The safety profile of itepekimab observed in the Phase 3 trials was consistent with prior clinical trials. Anti-drug antibodies were rare and had no apparent impact on itepekimab drug levels.

“COPD is a particularly complex disease, and novel approaches are needed to address the multiple underlying biological disease drivers,” said George D. Yancopoulos, M.D., Ph.D., Board co-Chair, President and Chief Scientific Officer at Regeneron. “We are proud of our work in this challenging treatment landscape, bringing Dupixent – the first-ever biologic medicine for COPD – to certain patients who previously had very limited options remaining. We are encouraged by the overall results from AERIFY-1 and the data through week 24 for AERIFY-2 and are reviewing the results from both itepekimab trials to inform next steps. We remain committed to our broader itepekimab development program and learnings from the AERIFY program will be invaluable as we continue to advance itepekimab in respiratory diseases with unmet need.”

Regeneron and Sanofi are reviewing the data and will discuss with regulatory authorities to evaluate next steps.

Detailed results from these trials will be presented at a future medical meeting. Itepekimab is currently being evaluated in other trials, including chronic rhinosinusitis without nasal polyps, chronic rhinosinusitis with nasal polyps and non-cystic fibrosis bronchiectasis.

"While we are encouraged by the results of AERIFY-1, the results of both studies merit further exploration to have a full understanding of the data and the role that IL-33 plays in this complex disease," said Houman Ashrafian, M.D., Ph.D., Executive Vice President, Head of Research and Development at Sanofi. "Certain people with COPD are in desperate need of new treatment options, especially those who continue to experience exacerbations despite being on maximal therapy, and we remain committed to discussing these data with regulatory agencies to evaluate our path forward."

The safety and efficacy of itepekimab are currently under clinical investigation and have not been fully evaluated by any regulatory authority.

About the Itepekimab COPD Trial Program

AERIFY-1 and AERIFY-2 are randomized, Phase 3, double-blind, placebo-controlled trials that evaluated the efficacy and safety of itepekimab in 1,127 (AERIFY-1) and 953 (AERIFY-2) adults aged 40-85 years who were former smokers with moderate-to-severe COPD. Former smokers were defined as those who have not smoked for at least six months.

Treatments were administered subcutaneously and added to double therapy (inhaled corticosteroid [ICS] plus long-acting beta2-agonist [LABA] or long-acting muscarinic antagonist [LAMA] plus LABA) or a maximal standard-of-care inhaled triple therapy (ICS, LABA and LAMA).

The primary endpoint for AERIFY-1 and AERIFY-2 was the annualized rate of acute moderate or severe COPD exacerbations. Moderate exacerbations were defined as those requiring systemic steroids and/or antibiotics. Severe exacerbations were defined as those: requiring hospitalization; more than 24 hours of observation in an emergency department or urgent care facility; or resulting in death.

The AERIFY program includes two additional ongoing trials: AERIFY-3, a Phase 2 mechanistic study assessing the impact of itepekimab on airway inflammation in patients with COPD, and AERIFY-4, a Phase 3 trial assessing the long-term safety of itepekimab in patients with COPD.

About Itepekimab

Itepekimab, which was invented using Regeneron's proprietary *VelocImmune*® technology, is a fully human monoclonal antibody that binds to and inhibits interleukin-33 (IL-33), an initiator and amplifier of broad inflammation in COPD. IL-33 is thought to be involved in different types of inflammation and is particularly elevated in the lungs of former smokers.

Itepekimab is being jointly developed by Regeneron and Sanofi under a global collaboration agreement and is currently in clinical development programs for chronic rhinosinusitis with nasal polyps (Phase 3), non-cystic fibrosis bronchiectasis (Phase 2) and chronic rhinosinusitis without nasal polyps (Phase 2).

About Regeneron's *VelocImmune* Technology

Regeneron's *VelocImmune* technology utilizes a proprietary genetically engineered mouse platform endowed with a genetically humanized immune system to produce optimized fully human antibodies. When Regeneron's co-Founder, President and Chief Scientific Officer George D. Yancopoulos was a graduate student with his mentor Frederick W. Alt in 1985, they were the first to envision making such a genetically humanized mouse, and Regeneron has spent decades inventing and developing *VelocImmune* and related *VelociSuite*® technologies. Dr. Yancopoulos and his team have used *VelocImmune* technology to create a substantial proportion of all original, FDA-approved fully human monoclonal antibodies. This includes Dupixent® (dupilumab), Libtayo® (cemiplimab-rwlc), Praluent® (alirocumab), Kevzara® (sarilumab), Evkeeza® (evinacumab-dgnb), Inmazeb® (atoltivimab, maftivimab and odesivimab-ebgn) and Veopoz® (pozelimab-bbfg). In addition, REGEN-COV® (casirivimab and imdevimab) had been authorized by the FDA during the COVID-19 pandemic until 2024.

About Regeneron

Regeneron (NASDAQ: REGN) is a leading biotechnology company that invents, develops and commercializes life-transforming medicines for people with serious diseases. Founded and led by physician-scientists, our unique ability to repeatedly and consistently translate science into medicine has led to numerous approved treatments and product candidates in development, most 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, neurological diseases, hematologic conditions, infectious diseases, and rare diseases.

Regeneron pushes the boundaries of scientific discovery and accelerates drug development using our proprietary technologies, such as *VelociSuite,* which produces optimized fully human antibodies and new classes of bispecific antibodies. We are shaping the next frontier of medicine with data-powered insights from the Regeneron Genetics Center® and pioneering genetic medicine platforms, enabling us to identify innovative targets and complementary approaches to potentially treat or cure diseases.

For more information, please visit www.Regeneron.com or follow Regeneron on LinkedIn, Instagram, Facebook or X.

About Sanofi
Sanofi is an R&D driven, AI-powered biopharma company committed to improving people's lives and creating compelling growth. We apply our deep understanding of the immune system to invent medicines and vaccines that treat and protect millions of people around the world, with an innovative pipeline that could benefit millions more. Our team is guided by one purpose: we chase the miracles of science to improve people's lives; this inspires us to drive progress and deliver positive impact for our people and the communities we serve, by addressing the most urgent healthcare, environmental, and societal challenges of our time.

Sanofi is listed on EURONEXT: SAN and NASDAQ: SNY.

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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 products marketed or otherwise commercialized by Regeneron and/or its collaborators or licensees (collectively, "Regeneron's Products") and product candidates being developed by Regeneron and/or its collaborators or licensees (collectively, "Regeneron's Product Candidates") and research and clinical programs now underway or planned, including without limitation itepekimab in adults who were former smokers with inadequately controlled chronic obstructive pulmonary disease ("COPD") and other potential indications ; the likelihood, timing, and scope of possible regulatory approval and commercial launch of Regeneron's Product Candidates and new indications for Regeneron's Products, such as itepekimab for the treatment of COPD as discussed in this press release as well as itepekimab for the treatment of chronic rhinosinusitis with nasal polyps, non-cystic fibrosis bronchiectasis, and chronic rhinosinusitis without nasal polyps; any feedback that may be provided by regulatory authorities on the results from the AERIFY-1 and AERIFY-2 trials discussed in this press release, including the impact of any such feedback on any potential regulatory approval of itepekimab; uncertainty of the utilization, market acceptance, and commercial success of Regeneron's Products and Regeneron's Product Candidates and the impact of studies (whether conducted by Regeneron or others and whether mandated or voluntary), including the studies discussed or referenced in this press release, on any of the foregoing or any potential regulatory approval of Regeneron's Products and Regeneron's Product Candidates (such as itepekimab); the ability of Regeneron's collaborators, licensees, suppliers, or other third parties (as applicable) to perform manufacturing, filling, finishing, packaging, labeling, distribution, and other steps related to Regeneron's Products and Regeneron's Product Candidates; the ability of Regeneron to manage supply chains for multiple products and product candidates and risks associated with tariffs and other trade restrictions; 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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 year ended December 31, 2024 and its Form 10-Q for the quarterly period ended March 31, 2025. 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 or otherwise) any forward-looking statement, including without limitation any financial projection or guidance, whether as a result of new information, future events, or otherwise.

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This press release contains forward-looking statements as defined in the Private Securities Litigation Reform Act of 1995, as amended. Forward-looking statements are statements that are not historical facts. These statements include projections and estimates regarding the marketing and other potential of the product, or regarding potential future revenues from the product. Forward-looking statements are generally identified by the words "expects", "anticipates", "believes", "intends", "estimates", "plans", and similar expressions. Although Sanofi's management believes that the expectations reflected in such forward-looking statements are reasonable, investors are cautioned that forward-looking information and statements are subject to various risks and uncertainties, many of which are difficult to predict and generally beyond the control of Sanofi, that could cause actual results and developments to differ materially from those expressed in, or implied or projected by, the forward-looking information and statements. These risks and uncertainties include among other things, unexpected regulatory actions or delays, or government regulation generally, that could affect the availability or commercial potential of the product, the fact that product may not be commercially successful, the uncertainties inherent in research and development, including future clinical data and analysis of existing clinical data relating to the product, including post marketing, unexpected safety, quality or manufacturing issues, competition in general, risks associated with intellectual property and any related future litigation and the ultimate outcome of such litigation, and volatile economic and market conditions, and the impact that global crises may have on us, our customers, suppliers, vendors, and other business partners, and the financial condition of any one of them, as well as on our employees and on the global economy as a whole. The risks and uncertainties also include the uncertainties discussed or identified in the public filings with the SEC and the AMF made by Sanofi, including those listed under "Risk Factors" and "Cautionary Statement Regarding Forward-Looking Statements" in Sanofi's annual report on Form 20-F for the year ended December 31, 2024. Other than as required by applicable law, Sanofi does not undertake any obligation to update or revise any forward-looking information or statements.

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