

Press release

Synairgen plc
(‘Synairgen’ or the ‘Company’)

Synairgen announces results of *in vitro* studies showing antiviral activity of interferon beta against key SARS-CoV-2 variants

- ***SNG001 shows potent antiviral activity against SARS-CoV-2 variants***
- ***Demonstrates broad-spectrum antiviral activity of host-targeted antiviral treatment delivered directly into the lungs***

Southampton, UK – 24 May 2021: Synairgen plc (LSE: SNG), the respiratory company developing an inhaled formulation of interferon beta (SNG001) as a broad-spectrum antiviral for the treatment of severe viral lung infections, currently in COVID-19 trials in the hospital and community settings, today announces results from *in vitro* studies showing the antiviral activity of SNG001 against two SARS-CoV-2 variants.

Interferon beta ('IFN-beta') is a naturally-occurring protein, which orchestrates the body's antiviral responses by triggering the production of hundreds of antiviral proteins which act across the viral replication cycle to confer broad-spectrum antiviral activity. Nebulised SNG001 is delivered directly into patients' lungs, the primary site of virus infection, to prevent severe lower respiratory tract illness caused by the SARS-CoV-2 virus.

Since the first outbreak of COVID-19 in Wuhan, a number of variants of SARS-CoV-2 have emerged that are spreading globally.¹ Changes to the virus have the potential to make it more transmissible or to enable the virus to evade the immune system, prompting concerns that some vaccines and therapeutics developed to prevent/treat COVID-19 may become less effective against certain variants. So-called “variants of concern” such as the “Kent”, “South African” and “Indian” variants^{2,3} have potential to halt or slow the reopening of societies despite progress with vaccination programmes. In the UK, alarm about the rapid growth of the so-called “Indian” variant has led to speculation that authorities may need to bring in renewed restrictions.

In vitro experiments were conducted at Viroclinics-DDL in the Netherlands to confirm that SNG001 had activity against the B.1.1.7 (“UK or “Kent”) and B.1.351 (“South African”) variants. In these experiments, Vero E6 cells were treated with SNG001 prior to and after infection with SARS-CoV-2. 16-24 hours after infection, the presence of SARS-CoV-2 viral proteins was determined using an immunostaining method. SNG001 potently reduced virus to undetectable levels in cells infected with “Wuhan-like” (virus strain: Germany/BavPat1/2020), the UK/Kent variant and the South African variant. Concentrations, readily achievable following inhaled delivery of interferon beta, that gave 90% inhibition (IC₉₀) were 3.2, 4.0 and 3.4 IU/mL respectively.

Prof. Sir Stephen Holgate CBE, Medical Research Council Clinical Professor of Immunopharmacology at the University of Southampton and Co-Founder of Synairgen, said: *“Emerging variants of SARS-CoV-2 are of great concern as they may negatively impact on the effectiveness of current vaccines and therapeutics. These data are not surprising, and confirm the broad-spectrum antiviral activity of SNG001, which has shown activity against a range of respiratory viruses such as RSV, rhinovirus, adenovirus and influenza, and reassuringly confirm its activity against these SARS-CoV-2 variants which is important in the context of our ongoing Phase III trial in hospitalised patients and the future use of this drug against SARS-CoV-2 and other emerging viral threats.”*

Richard Marsden, CEO of Synairgen, added: *“As expected, these data confirm that SNG001 is a broad-spectrum antiviral product, now also demonstrating applicability against SARS-CoV-2 variants. The SARS-CoV-2 virus suppresses the production of the essential antiviral protein IFN-beta to evade the host immune system; it is therefore to be expected that when IFN-beta is reintroduced into an infection experiment that the host cells are able to repel the virus.*

“Alongside vaccines, our lines of defence for this pandemic and future outbreaks rely in part on access to effective antivirals with broad-spectrum activity against a range of viruses and variants. The current focus on the Indian variant demonstrates how concerned Governments are about the risk that a variant may render the vaccines less effective, and we are pleased to see initiatives being put in place to accelerate and support development of antiviral therapeutics as a backstop for patients who are admitted to hospital. We are pleased to report that we will start dosing patients at trial sites in India in our Phase III study imminently.”

Synairgen has previously shown the antiviral activity of SNG001 in cell-based assays against key respiratory viruses, including rhinovirus, the most frequent cause of the common cold, RSV and influenza, including pandemic H1N1 2009 and H5N1 ‘bird flu’ strains and SARS-CoV-2. SNG001 also showed broad-spectrum antiviral activity in man with clinical efficacy seen in clinical studies conducted in asthma and COPD patients with respiratory viral infection caused by common cold (e.g. rhinovirus, RSV, parainfluenza, adenoviruses, HMPV and seasonal coronaviruses) and flu viruses.

References

1. *Lauring AS, Hodcroft EB. Genetic Variants of SARS-CoV-2-What Do They Mean? JAMA. 2021 Feb 9;325(6):529-531.*
2. <https://www.cdc.gov/coronavirus/2019-ncov/cases-updates/variant-surveillance/variant-info.html>
3. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/986380/Variants_of_Concern_VOC_Technical_Briefing_11_England.pdf

For further enquiries, please contact:

Synairgen plc

Richard Marsden, Chief Executive Officer

John Ward, Chief Financial Officer

Tel: + 44 (0) 23 8051 2800

finnCap (NOMAD and Joint Broker)

Geoff Nash, Kate Bannatyne, Charlie Beeson (Corporate Finance)

Alice Lane (ECM)

Tel: + 44 (0) 20 7220 0500

Numis Securities Limited (Joint Broker)

James Black, Freddie Barnfield, Duncan Monteith
Tel: +44 (0) 20 7260 1000

Consilium Strategic Communications (Financial Media and Investor Relations)

Mary-Jane Elliott, Jessica Hodgson, Carina Jurs
synairgen@consilium-comms.com
Tel: +44 (0) 20 3709 5700

MKC Strategies, LLC (US Media Relations)

Mary Conway
MConway@MKCStrategies.com
Tel: +1 516 606 6545

Notes for Editors**About Synairgen**

Synairgen is a clinical-stage respiratory drug discovery and development company founded by University of Southampton Professors Sir Stephen Holgate, Donna Davies and Ratko Djukanovic.

Synairgen is currently focused on developing its product candidate, SNG001 (inhaled interferon beta) for the treatment of COVID-19. SNG001 is potentially the first host-targeted broad-spectrum antiviral treatment delivered directly into the lungs. The Company is evaluating nebulised SNG001 in its Phase III clinical programme, which has been deemed an Urgent Public Health study by the UK's National Institute for Health Research (NIHR). SNG001 has also been granted Fast Track status from the US Food and Drug Administration (FDA). In a Phase II trial, COVID-19 patients with marked/severe breathlessness demonstrated a threefold greater chance of recovery when treated with SNG001 versus placebo.

Synairgen is quoted on AIM (LSE: SNG). For more information about Synairgen, please see www.synairgen.com

COVID-19

COVID-19, caused by the SARS-CoV-2 virus, is an ongoing global pandemic and there is widespread recognition of the urgent need for antiviral therapies, alongside vaccination programs, both for this and future pandemics. Such therapies could be used to prevent and effectively treat the severe lower respiratory tract illness that can occur with these types of diseases.

SNG001 (inhaled Interferon beta) applicability to COVID-19

Interferon beta ("IFN-beta") is a naturally-occurring protein, which orchestrates the body's antiviral responses. It is used widely in the treatment of multiple sclerosis and is a safe and well tolerated drug. There is growing evidence that deficiency in IFN-beta production by the lung could explain the enhanced susceptibility in 'at-risk' patient groups to developing severe lower respiratory tract (lung) disease during respiratory viral infections.

Viruses, including coronaviruses such as SARS-CoV-2, have evolved mechanisms which suppress endogenous IFN-beta production, helping the virus to evade the innate immune system. The addition of exogenous IFN-beta before or during viral infection of

lung cells in vitro either prevents or greatly reduces viral replication, potentially reducing the severity of infection and accelerating recovery.

Synairgen's SNG001 is a formulation of IFN-beta-1a for direct delivery to the lungs via nebulisation. It is near to pH neutral, and is free of mannitol, arginine and human serum albumin, making it suitable for inhaled delivery direct to the site of action. Phase I and II trial data have shown that SNG001 activates lung antiviral defences as measured in sputum cells, and that SNG001 has been well tolerated in approximately 280 asthma/COPD/COVID-19 patients to date. SNG001 has the potential to address the urgent need for antiviral therapies for COVID19 and for future pandemic respiratory infections, alongside vaccination programmes.

In July 2020, Synairgen announced the results of its Phase II double-blind, placebo-controlled study of 101 randomised COVID-19 hospitalised patients, which showed that SNG001 given for 14 days was associated with greater odds of improvement versus placebo on the WHO Ordinal Scale for Clinical Improvement (OSCI) and more rapid recovery to the point where patients were no longer limited in their activity, with a greater proportion of patients recovering during the 28-day study period.

The results were published in *The Lancet Respiratory Medicine*: "Safety and efficacy of inhaled nebulised interferon beta-1a (SNG001) for treatment of SARS-CoV-2 infection: a randomised, double-blind, placebo-controlled, phase 2 trial". Monk, P D PhD, et al., 12 November 2020, accessible [here](#).

The Company's global Phase III trial (SG018) evaluating SNG001 for the treatment of hospitalised COVID-19 patients is ongoing. The trial is deemed an Urgent Public Health study by the UK's National Institute for Health Research (NIHR). In the US, SNG001 has been granted Fast Track status from the US Food and Drug Administration (FDA). The Company is seeking further equivalent prioritisations and support from governments in participating countries.