

Press release

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

Recruitment complete for Synairgen’s Phase II IFN-beta clinical trial in asthma

Southampton, UK – 8 December 2011: Synairgen plc (LSE: SNG), the respiratory drug discovery and development company with a particular focus on viral defence of the lungs, is pleased to announce that the last subject has been successfully recruited into its Phase II proof of concept clinical trial of inhaled IFN-beta in exacerbation-prone asthmatics. The Company is on schedule to announce the results of the study in late Q1 2012.

Ends

For further information, please contact:

Synairgen plc

Tel: + 44 (0) 23 8051 2800

Richard Marsden, CEO
John Ward, Finance Director

FinnCap

Tel: + 44 (0) 20 7220 0500

Geoff Nash, Christopher Raggett (Corporate Finance)
Stephen Norcross, Simon Starr (Corporate Broking)

Threadneedle Communications

Tel: + 44 (0) 20 7653 9850

Graham Herring
Josh Royston

Notes for Editors

About Synairgen

Synairgen is a respiratory drug discovery and development company founded by Professors Stephen Holgate, Donna Davies and Ratko Djukanovic, with a particular focus on viral defence of the lungs in asthma, COPD and influenza. Synairgen is listed on AIM (LSE: SNG).

For more information about Synairgen please see www.synairgen.com.

Synairgen's interferon beta ('IFN-beta') programme

Synairgen is developing inhaled IFN-beta as a therapy in the following indications:

- virus-induced asthma and COPD exacerbations;
- "post exposure prophylaxis" for emerging viral threats; and
- patients hospitalised with severe viral lung illness

Using *in vitro* human models, it was discovered that epithelial cells (cells which line the airways) from both subjects with asthma¹ and COPD have significantly weaker antiviral responses to the common cold virus than healthy control subjects. The addition of low levels of IFN-beta into the models restored antiviral responses (simulating aerosolised IFN-beta therapy). This suggests that local delivery of IFN-beta to the lungs could limit the spread of virus to lungs in subjects with respiratory disease and the consequent worsening of their symptoms.

Synairgen has entered into a supply and licence agreement for a patent-protected formulation of IFN-beta from the Rentschler Group in Germany.

SG004

SG004, a placebo-controlled Phase I study in controlled asthmatics taking inhaled corticosteroids, used the Company's exclusively in-licensed Rentschler formulation of inhaled IFN-beta and was designed to establish its safety at three different dose regimens over a 14 day period. In addition, biomarker activity (see below) was measured as an indicator of antiviral activity. The trial was completed in September 2009 and showed that inhaled IFN-beta was well tolerated, causing no adverse effect on standard measures of lung function and inflammation.

SG004 Biomarkers

Neopterin is a well-recognised biomarker of IFN-beta activity. Having developed and validated a test for measuring neopterin in airway secretions, analysis of the SG004 samples showed statistically significant and dose dependant increases in neopterin levels, indicating that biologically active drug had been successfully delivered to the lung. Furthermore, there were increases of between 4-fold and 64-fold in the gene expression of three antiviral proteins (MxA, 2-5-OAS and IP-10) in the lung cells of the asthmatic volunteers 24 hours after inhaling IFN-beta, indicating that inhaled IFN-beta stimulated a broad antiviral response in the lung.

Activity of IFN-beta against 2009 H1N1 ('swine flu') and seasonal influenza

Laboratory experiments were undertaken in November 2009 for Synairgen by the Health Protection Agency's Centre for Emergency Preparedness and Response (Porton Down, Salisbury) which confirmed the antiviral potency of IFN-beta against

2009 H1N1. In the experiments lung cells were grown in cell culture and then exposed to the 2009 H1N1 (Strain: Influenza A/California/04/2009(H1N1)), resulting in around 70% of cells becoming infected. In the presence of IFN-beta, the proportion of cells infected with the virus was reduced by at least 94% over 3 experiments.

Synairgen has undertaken similar *in vitro* experiments which also confirm the antiviral potency of IFN-beta against seasonal influenza and H5N1 'Bird' flu.

SG005

SG005 is a placebo-controlled Phase II study of inhaled interferon beta ('IFN-beta') for the treatment of exacerbations of asthma caused by respiratory viruses including influenza. Following on from the discovery that IFN-beta significantly reduced the ability of influenza to infect lung cells, SG005 was broadened to allow the inclusion of subjects who contract influenza as well as common cold viruses. The study, which aims to randomise between 140 and 160 subjects, started in 2010 and results are expected in Q1 2012.

Patents granted

The patents for inhaled IFN-beta to treat rhinovirus infections in asthma and COPD were granted in the USA in 2009, Europe in 2010 and Japan in 2011. The patents form part of a patent portfolio owned by the University of Southampton, which is exclusively licensed to Synairgen.

Asthma statistics

- In 2009, approximately 25 million Americans had asthma²
- The economic cost to the USA of asthma is projected to be \$20.7 billion for 2010³
- In 2006, asthma accounted for 1.7 million emergency department visits in the USA²
- The cost of emergency department visits and in-patient care in relation to asthma in the USA for 2010 is projected to be \$5.5 billion³
- The average duration of a hospitalisation for an asthma exacerbation in the USA is 2.7 days at a cost of \$9,078⁴
- 50% of the total cost of the asthma is apportioned to 10% of the asthmatic population with the severest disease⁵

COPD statistics

- COPD includes chronic bronchitis and emphysema
- COPD is forecast to be the third leading cause of death worldwide (after heart attack and stroke) by 2030⁶
- In 2009, 13 million adults in the USA were estimated to have COPD⁷. However, as many as 24 million adults have some evidence of impaired lung function, implying an under-diagnosis of this disease⁸
- The economic cost to the USA of COPD is projected to be \$49.9 billion for 2010³
- Hospital care for COPD in the USA is projected to cost \$13.2 billion for 2010³ and in 2006 there were 672,000 hospitalizations for COPD in the USA⁷

Rhinovirus (common cold virus) and exacerbations (worsening of symptoms) of asthma

- Adults get an average of two to four colds per year, mostly between September and May. Young children suffer from an average of six to eight colds per year⁹
- Rhinovirus infections are the major cause of asthma exacerbations, accounting for 50% to 80% of all such attacks in both children and adults¹⁰

Influenza statistics

In the USA there are in excess of 200,000 hospitalisations¹¹ each year associated with influenza and the total economic cost of influenza is estimated to be in excess of \$80 billion per year¹². During the period 1976 to 2007, there were an average of 23,000 deaths per year in the USA associated with seasonal influenza¹³. Influenza accounts for approximately 50% of the viruses identified as causing severe viral lung infections; other viruses such as RSV, parainfluenza virus, rhinovirus, coronavirus and others account for the rest. Synairgen believes it has an advantage because its IFN-beta has shown activity against all of these viruses, whereas virus specific therapies such as Tamiflu and Relenza are active against specific viruses (in this case only influenza).

Pneumonia statistics¹⁴

- Every 20 seconds, somewhere in the world, a child dies from pneumonia
- Pneumonia is an infection of the lungs that is usually caused by bacteria or viruses. The most common viral causes are influenza, parainfluenza and respiratory syncytial viruses.
- In 2007, 1.2 million people in the US were hospitalised with pneumonia and more than 52,000 people died from the disease

Government grant activity to support antiviral research and development¹⁵

In recent years, US government agencies have awarded contracts with a total value in excess of \$500 million to assist companies with the development of non-vaccine antiviral therapies. Companies who are developing such products with support from US government agencies include BioCryst Pharmaceuticals Inc., Biota Holdings Limited, and Tekmira Pharmaceuticals Corporation.

References

1. P. Wark et al. Asthmatic bronchial epithelial cells have a deficient innate immune response to infection with rhinovirus. *J Exp Med.* 2005; 201: 937-947
2. American Lung Association. Trends in Asthma Morbidity and Mortality. July 2011 www.lungusa.org
3. National Heart, Lung and Blood Institute. Morbidity and Mortality 2009 Chart Book on Cardiovascular, Lung and Blood Diseases
4. V. Krishnan et al. Mortality in patients hospitalized for asthma exacerbations in the United States. *Am J Respir Crit Care Med* 2006 174, 633-638
5. P.J. Barnes, B. Johnson, J.B. Klim. The Costs of Asthma. *Eur Respir J* 1996 9, 636-642
6. World Health Organisation website

7. American Lung Association. Trends in COPD (Chronic Bronchitis and Emphysema) Morbidity and Mortality. August 2011 www.lungusa.org
8. Centers for Disease Control and Prevention. National Center for Health Statistics. National Health & Nutrition Examination Survey, 1988-1994
9. American Lung Association: Cold and Flu Guidelines: The Common Cold www.lungusa.org
10. J.T. Kelly et al. Host immune responses to rhinovirus: Mechanisms in asthma. *J Allergy Clin Immunol* 2008; 122: 671-682
11. W.W Thompson et al. Influenza associated hospitalizations in the United States. *JAMA* 2004 Sep 15;292(11):1333-40
12. N.A. Molinari et al. The annual impact of seasonal influenza in the US: measuring disease burden and costs. *Vaccine*. 2007 Jun 28; 25 (27): 5086-96
13. Centers for Disease Control and Prevention. Estimates of Deaths Associated with Seasonal Influenza - - - United States 1976-2007. *MMWR* August 27 2010/ 59(33); 1057-1062
14. Centers for Disease Control and Prevention. World Pneumonia Day is November 12 www.cdc.gov/Features/Pneumonia
15. Sourced from www.biocryst.com/peramivir, www.biota.com.au, www.tekmirapharm.com/programs/products