Press release

Synairgen plc

('Synairgen' or the 'Company')

Positive Phase II asthma clinical trial data

Southampton, UK – 19 April 2012: Synairgen plc (LSE: SNG), announces positive data from its Phase II clinical trial. This pioneering trial investigated the potential for SNG001 (inhaled interferon beta) to protect asthmatics from respiratory virus infections (principally the common cold) that can spread to the lung, which are a major cause of worsening asthma symptoms. It is estimated that viral infection is associated with up to eight out of ten asthma-related emergency department visits.

There are 5.4 million asthmatics in the UK (Asthma UK) and 25.7 million in the USA (Centers for Disease Control and Prevention).

The study investigated SNG001 in a population of 134 adult asthma patients, representing 'mild-moderate' through to 'severe' asthmatics, who caught a cold. Patients with 'difficult to treat' asthma, being approximately half of the patients in the trial, benefitted significantly from SNG001 treatment. This category of patient is estimated to represent between 10% and 20% of all adult asthma sufferers.

The key trial findings in this 'difficult to treat' category were:

- Clinically important and statistically significant differences in favour of SNG001 as compared to placebo across recognised measures of asthma symptom severity and lung function including:
    - Prevention of worsening of asthma symptoms during the critical first week of infection and treatment as measured by the Asthma Control Questionnaire (sACQ) (p=0.004)
    - 65% reduction in the number of patients experiencing moderate exacerbations during the treatment period (p=0.01)
    - Reduced use of inhaled reliever bronchodilators on day 5 (p=0.02) and day 6 (p=0.01)
    - In the SNG001-treated patients there was a steady improvement in morning peak expiratory flow whilst in the placebo-treated patients there was an initial dip during the first week followed by an improvement (p=0.03)
- SNG001 was well tolerated

Professor Stephen Holgate CBE, leading international asthma specialist and founder of Synairgen, said:

“This is a really promising breakthrough for the future treatment of asthma and one of the most exciting developments that I have seen in years. This is the first clinical study which appears to demonstrate that, by boosting the antiviral defences of the lungs of asthmatics rather than trying to inhibit rapidly evolving viruses, we can limit the adverse effects of viral infection significantly to prevent worsening of asthma symptoms in a high risk group of patients.

This trial is an important milestone in the development of our SNG001 programme from its origins in research supported by the MRC, Asthma UK, the British Lung Foundation, the National Institute of Health Research and the University of Southampton, to today’s exciting results in this ‘real world’ asthma study. Not only have we established the potential of SNG001 as a novel treatment for viral exacerbations in difficult to treat asthma but also a crucial link between viral infection, asthma symptoms and severity of disease.

These impressive findings across different endpoints, together with the accumulating body of evidence we have generated for other respiratory viruses such as influenza (Swine and Bird flu) and respiratory syncytial virus (RSV), strongly suggest that SNG001 has the potential to be used as a powerful broad spectrum antiviral respiratory drug in other lung diseases such as COPD and pandemic flu.”

Leanne Metcalf, Assistant Director of Research at Asthma UK, says:

“This has the potential to be one of the biggest breakthroughs in asthma treatments in the past 20 years. We are incredibly excited by the possibilities this research could bring to reduce hospital admissions and deaths as a result of asthma attacks. Over 80% of asthma attacks are triggered by cold and flu viruses, and until now we haven't had any effective treatments that can stop this from happening. This clinical trial demonstrates the potential of this anti-viral drug to prevent asthma attacks for thousands of people with severe asthma. We are incredibly proud to have played a part in the realisation of this research programme which should benefit people with asthma in a really significant way.”

Richard Marsden, Chief Executive of Synairgen, said,

“This is a great result for the development of our programme. To put SNG001’s potential into context, it is estimated that in the US alone there are some 2 to 4 million difficult to treat (Step 4 and 5) adult asthma sufferers who could benefit from this therapy. Children, who get more colds than adults, represent an additional asthma market opportunity. We believe that there will be even greater potential in COPD. We continue to analyse the wealth of data generated by this important trial and to plan the next phase of its development, ideally alongside an industry partner. ”

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Notes to Editors

1) About Synairgen

Synairgen is a respiratory drug development company founded by Professors Stephen Holgate, Donna Davies and Ratko Djukanovic at the University of Southampton, with a particular focus on lung antiviral defence in asthma, COPD and severe viral infections. Synairgen is listed on AIM (LSE: SNG).

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

2) SG005 Structure of trial and detailed study findings

Structure of trial

The Phase II multi-centre, randomised, double-blind, placebo-controlled study recruited a broad spectrum of adult asthmatic patients, all of whom were taking inhaled corticosteroids and had a history of deteriorating symptoms when they contracted common respiratory viruses (primarily the common cold). 147 patients were randomised to receive either SNG001 or placebo for 14 days at the onset of cold symptoms.

Detailed study findings

- 134 out of the 147 patients (91%) who commenced treatment had confirmed colds as determined by the Jackson Cold Score and formed the modified intention to treat population (mITT). These patients are used for the analysis of efficacy.
- A range of respiratory viruses were identified in nasal lavage and sputum samples, of which rhinoviruses represented 68% of detected viruses.
- Common cold symptoms tightly correlated with worsening asthma symptoms.

- Patients with worse underlying asthma (more intensively treated with routine asthma therapies) before onset of cold symptoms were more adversely affected by the cold than patients with less problematic asthma.
- Approximately half the patients in the trial were categorised as falling within the highest two steps of the asthma spectrum as defined by the British Thoracic Society (BTS) and Global Initiative for Asthma (GINA) Guidelines (Steps 4 and 5). This group is estimated to represent some 10%-20% of the adult asthma population and is the most expensive to treat.
- Whilst the trial did not meet its primary endpoint in the overall population, in a planned analysis, patients with difficult to treat asthma (BTS Steps 4 and 5, placebo: n=31; SNG001: n=27) were found to benefit clinically from SNG001 treatment compared to placebo as detailed below:
    - A clinically meaningful and statistically significant favourable difference in asthma control, measured using the shortened Asthma Control Questionnaire (sACQ) over the first week of treatment (for which a change in individual score of 0.5 or more is considered to be clinically relevant):
        - from pre-treatment baseline levels (mean change in sACQ score: placebo: 0.53, SNG001: -0.10, difference: -0.63, p=0.004). This met the criteria for the primary endpoint.
        - from screening levels (mean change in sACQ score: placebo: 0.90, SNG001: 0.22, difference: -0.67, p=0.003).

      Furthermore, the proportion of patients having an increase of more than 0.5 (p=0.012) from pre-treatment baseline was reduced by two-thirds in SNG001-treated patients over the first week of treatment.
    - The proportion of patients having moderate exacerbations was significantly lower in SNG001-treated patients (placebo: 54%; SNG001: 19%) during the treatment phase (p=0.01).
    - In addition (and not included in the moderate exacerbation data above), during treatment, 2 placebo patients (one of whom was hospitalised for 5 days) took a course of oral steroids and one other placebo patient had a course of antibiotics (all for a deterioration in asthma symptoms). No SNG001 patients required oral steroids, hospitalisation or antibiotics during treatment.
    - Inhaled reliever bronchodilator usage was significantly less for the SNG001-treated patients on day 5 (p=0.017) and day 6 (p=0.0096).
    - Morning peak expiratory flow rate (‘PEFR’), a measure of lung function, was significantly lower in placebo compared to SNG001-treated patients as measured by area under the curve analysis of morning PEFR change from Day 2 to the end of treatment (p=0.03). Day 2 was the first timepoint at which morning PEFR was recorded during the treatment period.

- The Company has also conducted statistical analyses using the GINA step classifications. Similar results were found for the difference in sACQ over the first week of treatment in Step 4 and 5 GINA classified patients (a more expansive group than the BTS classification: placebo: n=42; SNG001: n=32) between SNG001- and placebo-treated patients:
    - from pre-treatment baseline levels (mean change in sACQ score: placebo: 0.40, SNG001: 0.00, difference: -0.40, p=0.048).
    - from screening levels (mean change in sACQ score: placebo: 0.78, SNG001: 0.32, difference: -0.46, p=0.028).
- Viral infection in both groups was accompanied by an increase in a biomarker of anti-viral activity. While this rapidly decayed in the placebo-treated group, those receiving SNG001 had a persistent elevation in the biomarker as long as the 14 day treatment was administered, but rapidly decayed to screening levels after treatment. Thus SNG001 was pharmacologically active irrespective of asthma severity.
- SNG001 was well tolerated, in line with the Phase I data.

Stepwise management of asthma in adults

- British Guideline on the Management of Asthma (produced by The British Thoracic Society ('BTS') and Scottish Intercollegiate Guidelines Network)[1]
    - Step 1 (Mild intermittent asthma) – inhaled short-acting beta-agonist
    - Step 2 (Regular preventer therapy) – add inhaled steroid 200-800 mcg/day*
    - Step 3 (Initial add-on therapy) – add inhaled long-acting beta-agonist ('LABA'). If no response, stop LABA, increase inhaled steroids to 800mcg/day* and trial other therapies such as leukotriene receptor antagonist or SR theophylline
    - Step 4 (Persistent poor control). Consider trials of :increasing inhaled steroid up to 2000 mcg/day*; addition of fourth drug (eg leukotriene receptor antagonist, SR theophylline, beta-agonist tablet)
    - Step 5 (Continuous or frequent use of oral steroids). Use daily steroid tablet. Maintain high dose inhaled steroid at 2000 mcg/day*

  *****BDP or equivalent

  For the full guidelines refer to the British Thoracic Society website (www.brit-thoracic.org.uk).

- Global Initiative for Asthma ('GINA') Treatment Steps[2]
    - Step 1 – inhaled short-acting beta-agonist ('SABA')
    - Step 2 – SABA plus either low dose inhaled steroid or leukotriene modifier
    - Step 3 – SABA plus one of:
        - low dose inhaled steroid + LABA
        - medium or high dose inhaled steroid
        - low dose inhaled steroid + leukotriene modifier
        - low dose inhaled steroid + SR theophylline
    - Step 4 – To Step 3 treatment select one or more of:
        - Medium or high dose inhaled steroid + LABA

        - Leukotriene modifier
        - SR theophylline
    - Step 5 – Step 4 treatment plus one of:
        - Oral steroid
        - Anti-IgE treatment

For the full guidelines refer to the GINA website (www.ginasthma.org).

3) Background to Synairgen's interferon beta ('IFN-beta') programme for virus-induced asthma exacerbations

Using *in vitro* human models, it was discovered that epithelial cells (cells which line the airways) from patients with asthma[3] have significantly weaker antiviral responses to the common cold virus than non-asthmatic controls. 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 the lungs in patients 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 dependent 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.

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.

4) Asthma statistics

- 25.7 million Americans have asthma, of which 18.7 million are adults (aged 18 and over) and 7.0 million are children[4]

- The economic cost to the USA of asthma is projected to be $20.7 billion for 2010[5]
- In 2006, asthma accounted for 1.7 million emergency department visits in the USA[6]
- Hospital care for asthma in the USA is projected to be $5.5 billion for 2010[5]
- The average duration of a hospitalisation for an asthma exacerbation in the USA is 2.7 days at a cost of $9,078[7]
- 50% of the total cost of asthma is apportioned to 10% of the asthmatic population with the severest disease[8]

5) 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 year[9]
- Rhinovirus infections are the major cause of asthma exacerbations, accounting for 50% to 80% of all such attacks in both children and adults[10]

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