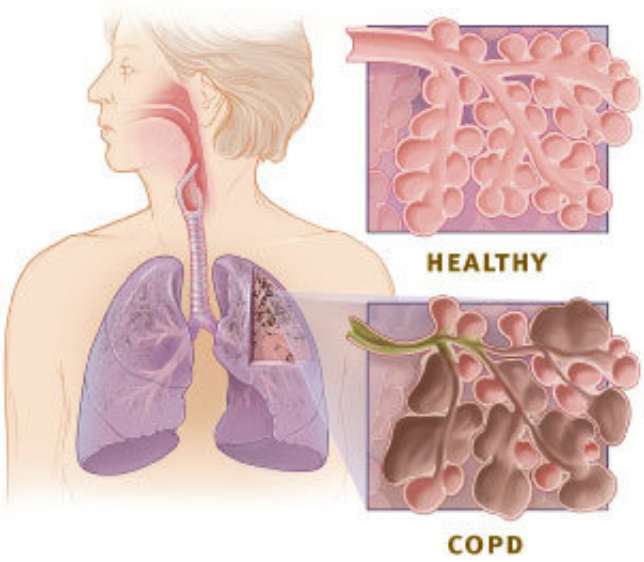
Repurposing heparin for inhalation may offer hope to millions with COPD

December 1 2017



A healthy lung versus a lung in someone with COPD. Credit: University of Portsmouth

A drug used to thin blood has been found to also significantly improve the ability to breathe when inhaled by people with COPD (chronic obstructive pulmonary disease), for which there is no cure.

New research led by the University of Portsmouth potentially gives hope to the 1.2 million patients in the UK with COPD — and to the many millions worldwide.

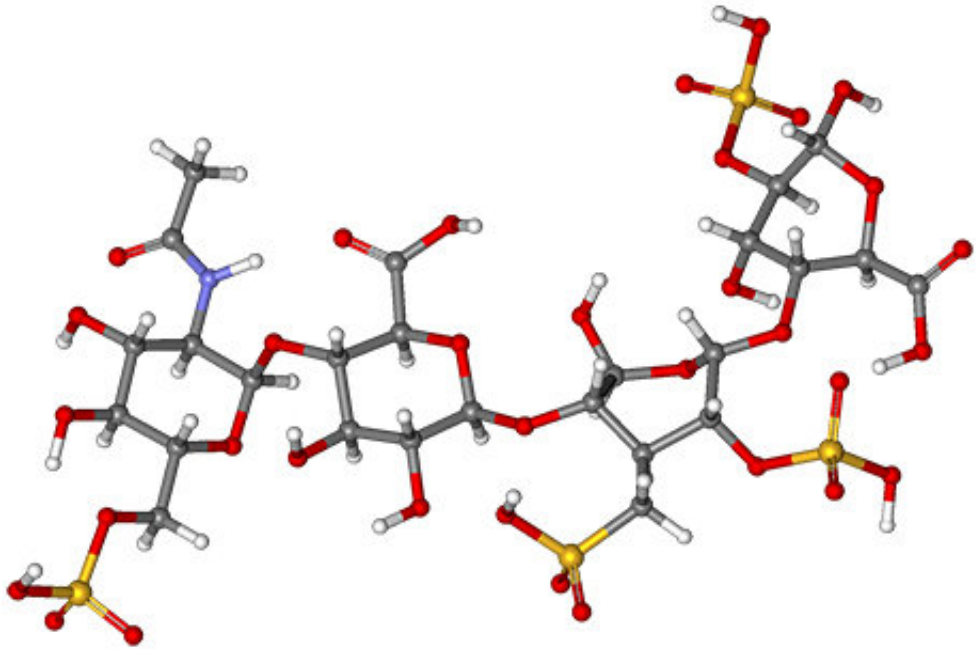
COPD is an umbrella term used to describe the progressive loss of lung function and airflow limitation due to a combination of emphysema and small airways disease (chronic bronchiolitis), which are often accompanied by chronic bronchitis leading to cough and sputum production.

In the UK, a person is diagnosed with COPD every five minutes, making it the second most common lung disease after asthma.

Current treatments do not stop the steady worsening of the symptoms including struggling to breathe, a poor quality of life and often, early death.

Janis Shute, a Professor of Respiratory Pharmacology at the University of Portsmouth's School of Pharmacy and Biomedical Sciences, has published the results of a pilot study which shows that inhaling nebulised unfractionated heparin significantly improves lung function and a patient's ability to exercise, without any side-effects. It also reduced the laboured breathing common in those with moderate to severe COPD.

It is the first time heparin's effect on lung function has been tested in patients with this disease.



Heparin. Credit: University of Portsmouth

Professor Shute said: "COPD is a rising global healthcare problem.

"It is clear that new therapeutic approaches are urgently needed to alter the course of the disease and the progressive loss of lung function leading to significantly reduced quality of life and early death in patients.

"Current treatments are limited and none conclusively modify the long-term decline in lung function, so to find that inhaled heparin is safe and provides clear benefits to people with moderate to severe COPD is excellent and encouraging for further clinical trials.

"We knew heparin was a drug with what could be described as a complex and diverse molecular scaffold, making it suitable for multiple health treatments, from wound healing to anti-inflammatories. Our laboratory studies further showed that heparin has unique mucus

thinning properties, making it easier for patients to clear their airways. That we saw such improved patient outcomes in a short time may reflect its unique pharmacological profile – it is naturally able to perform many roles."

In the study, 40 patients aged 50-85 had their lung capacity, ability to exercise and dyspnoea – laboured breathing – measured before and after treatment lasting 21 days.

Heparin made a clinically significant improvement (more than 10 per cent) in lung function measured by the amount of air forcibly exhaled from the lungs in one second after taking the deepest breath possible. The same test is used to help determine both the presence and severity of lung diseases.

Inhaled heparin has also been shown to be safe and without side-effects in patients with cystic fibrosis. The investigators say more research is now needed to confirm the long-term safety of inhaled heparin in patients with COPD and cystic fibrosis.

Provided by University of Portsmouth