

## $^{18}\text{F}$ gases as PET tracers for ventilation studies

### Diagnosis and prognosis of lung function in respiratory diseases

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Novel gaseous F-18 based radiotracers for the diagnosis and prognosis of lung function in respiratory diseases and ventilation studies in different clinical settings.



#### Background:

Positron emitting-labelled gases for PET ventilation studies have been described based on Neon-19 or Nitrogen-13 labelled  $\text{N}_2$ . However, these isotopes are endowed with a very short half-life which impairs their widespread use and commercialization. Regarding SPECT, contrast agents currently in use are particle-based and produce hot spots in hypo-ventilated areas and remain in the lung for a long time, which might be a liability in terms of safety. Fluorine-18 ( $^{18}\text{F}$ ) is one of the standard labels for PET applications and has a much longer half-life than other isotopes (109.7 mins).  $^{18}\text{F}$ -labelled gases are the ideal radiotracers for ventilation studies.

#### Technology:

The present invention provides a process for the production of a pharmaceutical composition comprising  $^{18}\text{F}$ -labelled sulfur hexafluoride ( $^{18}\text{F}$ ] $\text{SF}_6$ ) or carbon tetrafluoride ( $^{18}\text{F}$ ] $\text{CF}_4$ ), the pharmaceutical composition itself and the use of this composition as an image contrast agent.

#### Example applications:

Ventilation studies for the diagnosis and prognosis of respiratory diseases in lung function studies in different clinical settings.

#### References:

•V. Gómez-Vallejo, A. Lekuona, Z. Baz, B. Szczupak, U. Cossio, J. Llop. *Ion beam induced  $^{18}\text{F}$ -radiofluorination: straightforward synthesis of gaseous radiotracers for the assessment of regional lung ventilation using positron emission tomography*. Chem. Commun., 2016,52, 11931-11934.