NON-TECHNICAL SUMMARY (NTS)

Project Title (max. 50 characters)	Respiratory Pharmacology	
Key Words (max. 5 words)	Respiratory diseases, lung, inflammation, rodent	
Expected duration of the project (yrs)	5 years	
Purpose of the project as in ASPA section 5C(3) (Mark all boxes that apply)	√	Basic research
	√	Translational and applied research
		Regulatory use and routine production
		Protection of the natural environment in the interests of the health or welfare of humans or animals
		Preservation of species
		Higher education or training
		Forensic enquiries
		Maintenance of colonies of genetically altered animals[1]
Describe the objectives of the project (e.g. the scientific unknowns or scientific/clinical needs being addressed)	To help in the identification of new medicines for the treatment of human respiratory diseases.	
What are the potential benefits likely to derive from this project (how science could be advanced or humans or animals could benefit from the project)?	In the UK, more than a quarter of people will die from a respiratory disease, various forms of which claim 70,000 lives a year. The figures put Britain at the bottom of the European league table in survival rates for illnesses such as asthma, influenza and chronic obstructive pulmonary disease (COPD). In addition these diseases place a significant burden on society. In 2011, the total cost of respiratory disease in the 28 countries of the EU alone amounts to more than €380 billion annually for treatment, lost productivity and disability costs. The aim of this project is to identify novel treatments for respiratory diseases that could be more effective than those currently available.	
What species and approximate numbers of animals do you expect to use over what period of time?	Mice 4700 Rats 4700 Guinea pigs 2200	
In the context of what you propose to do to the animals, what are the expected adverse effects and the likely/expected level of severity? What will	As we try to identify new medicines, studies conducted under this licence may induce some adverse effects in some of the animals. We need to induce some respiratory disease-like symptoms in order to allow the effectiveness of the potential new medicines to be tested. Typical adverse effects	

happen to the animals at the end?	include a changes in appearance, for example ruffled fur or changes in behaviour, for example the animals may become subdued. Other effects may include reduction in body weight and/or reduced eating. The larger proportion of animals used in these studies will, however, not experience any noticeable adverse effects. For the vast majority of animals the severity level will be mild. However, as stated above in some studies the animals will experience some adverse effects but these would only cause the animal a moderate level of distress. In a few studies devices that allow the slow release of the new medicine may be surgically implanted under the skin under a general anaesthetic. At the end of the study the animals will be humanely killed. After the animals are killed samples of body tissue are sent to laboratories for close examination to give more information about the effects of the potential new medicines.
Application of the 3Rs	
1. Replacement State why you need to use animals and why you cannot use non-animal alternatives	There is a point in the development of new medicines when using cells alone or other non-animal experiments cannot reproduce what happens in the whole human body. Using isolated cells, cultured cells or tissue samples can mimic some aspects of the disease. It is extremely difficult, however, to do non-animal experiments that are able to predict how a potential new medicine will be distributed around a body and if it will have a specific adverse effect on certain organs of the body. To fully understand these different interactions/effects animals have to be used.
2. Reduction Explain how you will assure the use of minimum numbers of animals	Each experiment will use the minimum number of animals required to ensure that the results obtained are reliable and allow decisions to be made on the development of the potential new medicine. How the studies are run and the results from them will be continuously reviewed to see if fewer animals can be used and still produce results that will help in the development of new medicines. This licence is to look at potential new medicines that have a good chance of being used in patients. As such the number of new medicines being investigated and therefore the number of studies carried out is predicted to be relatively low.

3. Refinement Explain the choice of species and why the animal model(s) you will use are the most refined, having regard to the objectives. Explain the general measures you will take to minimise welfare costs (harms) to the animals.	Mice and rats are the best animals to use in this kind of study. Their mammalian bodies are incredibly similar to those of humans in many respects and provide a good way of predicting how a medicine will react inside the human body. A great deal is already known about the effects of medicines on mice and rats and this information is used when new medicines are being developed. We also use guinea pigs in some of our experiments because their airways are generally more similar to human airways than the airways of other rodents. Painkillers will be given to the animals when appropriate. We have developed Special Welfare Assessment Sheets (WAS) which allow us to identify the most humane point at which to stop an experiment. These sheets will allowed us to identify relatively minor reactions to a potential new medicine which we know will get worst over time and stop an experiment before this happens.