



A naturalistic cat exposure chamber validation

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European Respiratory Journal 2017 50: PA1173; DOI: 10.1183/1393003.congress-2017.PA1173

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Abstract

Introduction: A naturalistic cat exposure chamber is designed to mimic exposure in a home with cats. However, in a research setting, it is necessary to expose subjects to controlled levels of the major cat allergen Fel d1.

Objectives: The purpose of this study is to evaluate means to ensure stable and consistent levels of Fel d1 to facilitate future cat allergen exposure studies.

Methods: The chamber, volume 520 ft³ (14.7 m³) can accommodate two cats and 1-2 subjects. Air sampling pumps (Gillian 5000) with glass fiber filters (Millipore) will be set up at 3 locations in the chamber to measure the major cat antigen, Fel d1 which is eluted from the filters and quantified using ELISA (Indoor Biotechnologies). After introduction of cats 15-minute samples will be collected weekly, to follow Fel d1 level evolution and its consistency at different points in the room. Chamber cleaning and air circulation will be evaluated as a way to control and homogenize allergen levels.

Results: Preliminary data from one sampling pump obtained after 3 days for intervals of 15 minutes, after shaking the cat's blanket, showed a decrease in Feld1 levels from 39.7 to 12.3 to 9.2 to 4.4 ng/m³ after 15, 30, 45, and 60 minutes, respectively suggesting this is suboptimal to aerosolize cat dander.

Conclusions: The results of this study should allow controlled levels of Fel d1 similar to those seen in homes with cats to be maintained in the exposure chamber.

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