Animal House Exposure to Endotoxin and Rodent Allergens

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Rationale: A consistent method for measuring airborne allergens and endotoxin in animal houses is essential for evaluating the risk of sensitization and the impact of measures taken to reduce exposure.

Methods: Levels of airborne mouse and rat allergens in animal rooms were measured using a recently described method for collecting airborne allergens employing an ion charging device (The Sharper Image's Ionic Breeze Quadra) running at 1.7m^3/min for 24 hours, along with a two-site monoclonal assay for rat and a monoclonal primary/polyclonal secondary assay for mouse (Indoor Biotechnologies). Airborne endotoxin was assayed in parallel using the FDA-standardized Limulus Amoebocyte Lysate test QCL 1000 (Bio-Whittaker).

Results: Airborne mouse and rat was present in relevant animal rooms, however there was a very wide range of results for both allergens (<.004ng/m^3 to >6ng/m^3) and endotoxin (<2.4pg/m3 to >1000pg/m^3). The primary factor influencing airborne allergen and endotoxin was the presence of filter tops on individual animal cages for mouse (allergen p=.003, endotoxin p=<.01) and rat (allergen p=.013, endotoxin p =.001). Each of the values were reduced by >98%.

Conclusions: Though previous studies have attributed reduced allergen levels to filter tops, this study shows the same effect on endotoxin levels. The levels of allergen and endotoxin measured in animal rooms with filter tops is similar to the levels of endotoxin and common indoor airborne allergens in domestic studies and thus is in itself a sufficient prevention against exposure for animal technicians.