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subjects showed positive metacholine challenge, PD20 ranging from 20 to 600 mcg. The study was performed outside the pollen season, when all symptom free. All patients with allergic asthma showed a clinical and cytological reaction upon allergen specific challenge (30 min-early phase reaction), while neither clinical or cytological reaction were elicited in non-allergic asthmatic subjects and healthy volunteers upon ASCC.

The study confirm the usefulness of ASCC in allergic inflammation and supports its employment also in patients with single history of allergic asthma.

#### P2462

##### Studies of Serum sIL-2R, Eosinophil Level and Pulmonary Function in Allergic Asthma after Antigen Provocation

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We performed antigen inhalation provocation tests in 31 allergic asthma patients and 12 normal subjects, and detected pre-provocation and post-provocation pulmonary function, meanwhile determined serum soluble interlenkin-2 receptor (sIL-2R), eosinophils (Eos), total serum IgE (TIgE) and specific IgE (sIgE). The results: The post-provocation serum sIL-2R, Eos, TIgE and sIgE of asthma patients were higher than those of normal subjects and before provocation ( $P < 0.01$ ), while FEV<sub>1</sub>, FVC, sGaw significantly decreased and Raw remarkably increased after provocation compared with those of normal subjects and before provocation ( $P < 0.01$ ). Correlation analysis showed that sIL-2R, Eos were significantly negatively correlated to FEV<sub>1</sub>, sGaw and remarkably positively correlated to Raw. The above results indicated that sIL-2R was one of the marker of T cell activation and Eos infiltration played an important role in the changing of pulmonary function. sIL-2R level and Eos number were closely related to the degree of bronchial hyperresponsiveness in asthma patients, and they might be regarded as objective evidences in clinical diagnosis and treatment.

#### P2463

##### Aspecific Airway Hyperresponsiveness in Mono-Sensitive Sicilian Patients with Allergic Rhinitis Correlates with Serum IgE Levels and Blood Eosinophils during and Out Pollen Season

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Allergic rhinitis has been said to be a risk factor for the development of asthma as suggested by its frequent association with airway hyperreactivity. However, little is known about the effect of natural specific allergen exposure on the bronchial reactivity of mono-sensitive patients with rhinitis in the Southern Mediterranean area, in relation to skin reactivity to allergens, serum IgE levels and blood eosinophils. The significance of the association between allergic rhinitis, asthma and abnormal airway responsiveness with regard to the pathogenesis of asthma is unclear. For this reason, we have studied aspecific bronchial hyperreactivity, in patients with seasonal allergic rhinitis, with reference to the responsible allergen. The aim of the study was to correlate the bronchial responsiveness to methacholine in subjects with allergic rhinitis during and out the pollen season with serum IgE and blood eosinophils. Forty-nine nonsmoking patients with clinical diagnosis of allergic rhinitis and mono-positive skin prick test (SPT) to pollen allergens were enrolled in the study. Twenty patients suffered from seasonal rhinitis to *Parietaria* pollen, 15 patients to *Gramineae* pollen and 14 patients to *Olea* pollen. In all patients lung function measurements (assessed as response to methacholine), serum IgE and eosinophil were measured during and out pollen season.

During pollen season 16 out 49 rhinitis patients demonstrated values of PC<sub>20</sub>-FEV<sub>1</sub> above the asthmatic range whereas out pollen season only 8 patients were in the asthmatic range. By analysing the results with reference to the responsible allergen, during the pollen season 15 out 16 patients were *Parietaria*-sensitive and out pollen season 7 patients. Finally, in *Parietaria*-sensitive rhinitis bronchial responsiveness, both during and out pollen season, significantly correlated with serum IgE and with blood eosinophil counts.

Our results are consistent with the hypothesis that *Parietaria* is much important than *Olea* and *Gramineae* as a risk for developing nonspecific bronchial hyperresponsiveness. On the whole, present observations provide further evidence that there is an interrelationship of allergen kind, IgE, eosinophil and bronchial hyperresponsiveness suggesting that they may play a role in the development of bronchial asthma in rhinitis patients.

#### P2464

##### Contribution of Separate House Dust Mite Avoidance Measures in Improving the Clinical Condition of Asthmatic Patients

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**Background:** House dust mite (HDM) allergens, especially *Der p 1*, are known to influence respiratory morbidity in mite-allergic asthmatics. Reduction of exposure

to these allergens is therefore an important aspect of asthma treatment. Because mattresses, bedding and textile floor-covering constitute the major domestic reservoirs of HDM-allergens, avoidance measures concentrating on these sites are probably of primary importance. However, avoidance measures are expensive and often require substantial effort from either patients or relatives. It is therefore important to evaluate whether it is necessary to reduce HDM in both mattress, bedding and floor-covering or to concentrate in one or two of these sites for the treatment of adult asthmatics.

**Methods:** In a double-blind placebo controlled intervention trial, the effect of different avoidance measures was assessed. After a baseline period of 4 weeks, 133 HDM-allergic patients with asthma (FEV<sub>1</sub>% pred: 86%, PC<sub>20</sub>:0.72 mg hist./ml) were randomly allocated to an active and placebo sanitation group. The active sanitation consisted of treating floor covering with Acarosan<sup>®</sup> and encasing mattress and bedding with HDM-impermeable covers (Intervent<sup>®</sup> Bedding Systems, W.L. Gore & Ass). The placebo sanitation consisted of treatment of the covering with water and the use of mattress covers, which were permeable to the house dust mite. At the start of the baseline and 8 weeks after the intervention separate dust samples were taken from the mattress, livingroom and bedroom floor with a vacuum cleaner (Philips TC836, 1400 W). FEV<sub>1</sub> and PC<sub>20</sub> (bronchial hyperresponsiveness) were assessed simultaneously. By means of a pooled analysis and multiple linear regression (adjusted for age, gender and smoking) it was assessed which of the changes in *Der p 1* of three sampling sites contributed most to the changes in FEV<sub>1</sub> and PC<sub>20</sub>.

**Results:** The changes in *Der p 1* achieved at the mattress (ng/g) and the bedroom floor (ng/m<sup>2</sup>) contributed most to the changes of FEV<sub>1</sub> in these adult asthmatics. Changes in *Der p 1* concentration of the livingroom did not contribute to the changes in FEV<sub>1</sub>. There was no significant relation of the changes in *Der p 1* at any of the three sites with changes in PC<sub>20</sub>.

**Conclusion:** Because reductions in *Der p 1* at the bedroom floor and the mattresses had a positive effect on FEV<sub>1</sub>, avoidance measures at these sites are recommended in adult asthmatics. Reductions in *Der p 1* at the livingroom floor had no influence on the FEV<sub>1</sub>, probably due to the fact that adults are less exposed to *Der p 1* of the livingroom compared with children. It is therefore questionable whether avoidance measurements of the livingroom floor should be recommended to HDM-allergic adults. Costs and effort will be saved in this way.

#### P2465

##### The Microfungus *Trichoderma Viride* Potentiate in Low Concentrations Histamine Release from Human Bronchoalveolar-Cells

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In the last years, there have been several reports of dampness and associated mould growth in buildings damaged by water. Cases of sick building syndrome including respiratory symptoms have been reported from persons exposed to indoor air in these buildings. Heavy growth of *Trichoderma viride* (TV) are often found in the building materials. Microorganisms may contribute to the symptoms by initiating mediator release and inflammatory reactions leading to mucosal damage. The capability of TV to trigger or potentiate histamine release (HR) from mast cells in the airways epithelium was therefore examined in cells obtained by bronchoalveolar lavage (BAL) and compared with the action on basophils from peripheral blood. An equal HR was obtained in BAL-cells and basophils since TV in the range of 0.1 to 2 mg/ml induced HR from 3 to 20%. The HR was non IgE-mediated, verified by unchanged basophil response when IgE were removed from the cell-surface. However, in very low concentrations the fungus was able to potentiate HR from BAL-cells. A four-fold increase in IgE-mediated HR caused by anti-IgE antibody was thus obtained by 0.1 ng/ml TV. This is in contrast to the high concentrations (10<sup>-2</sup> mg/ml TV) needed to enhance basophil HR. These findings indicate that the mucosal mast cells are very sensitive to the fungus and inhalation of TV in sick buildings may therefore be harmful especially in atopic subjects.

## Clinical and experimental aspects

#### P2466

##### Nitric Oxide: A Role in Maintenance of Systemic and Pulmonary Vascular Tone in Man

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The aim of his study was to examine whether the vasodilator nitric oxide (NO) has a role in maintaining basal vascular tone in normal man. 10 normal male volunteers 26 ± 5 years were studied on two separate occasions in a double blind, placebo controlled crossover study. They were randomised to receive either a continuous infusion (4 mg/kg/min) of N<sup>G</sup>-monomethyl-L-arginine (L-NMMA) with a front loaded bolus (4 mg/kg) or volume matched placebo. Pulsed wave Doppler echo-