patterns. Another factor possibly associated with pet ownership is increased Vitamin D among family members as pet keeping may be correlated with lifestyles involving increased outdoor exposure, such as dog walking. Prenatal vitamin D inadequacy has been hypothesized as a risk factor for pediatric atopy and asthma.

Methods: To investigate potential relationships between household pet exposure and cord blood vitamin D concentrations, we analyzed information from a large, geographically-based, general risk birth cohort. Household pets were assessed during pregnancy and serum level of 25 (OH)D (25-hydroxyvitamin D) in cord blood was used as the measure of vitamin D and a marker of maternal level. Because of notable differences in vitamin D concentrations between African Americans and Whites, analyses were stratified by race.

Results: A total of 1055 newborns were included in the study: 62.4% were African Americans and 49.4% were female. For Whites, but not African Americans, having no pet compared to 1 or >1 pet during pregnancy was associated with lower cord blood vitamin D concentrations (37.7, 45.2, 47.0 nmol/L, respectively, P = 0.001). Considering type of pet, the relationship for no pet compared to 1 or >1 dog (37.7, 46.1, 49.9 nmol/L, respectively, P = 0.001) was similar to that for no pet versus 1 or >1 cat (37.7, 43.0, 46.5 nmol/L, respectively, P = 0.065).

Conclusions: In a large ethnically diverse cohort of newborns, the presence of a pet in the home during the prenatal time period was associated with higher cord blood vitamin D, but only among Whites. This racial difference may reflect an impact on pet owner behavior resulting in increased outdoor exposure that is limited to lighter skinned individuals. However, as the effect doesn’t vary by cats versus dogs, differences by race in factors correlated with pet ownership or variations in pet keeping styles may be more important. Vitamin D should be considered in studies of pets and atopic conditions.

Conclusions: This survey revealed the existence of house dust mites in Mexico. It seems there are differences between the geographical distribution of the species because of the local conditions of temperature and humidity of each urban ecosystem. This knowledge may be useful in the field of allergy medicine.

INHALED CORTICOSTEROIDS FOR ASTHMA

112 Comparison of the Use Ciclesonide Versus Fluticasone for the Treatment of Asthma in Children
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Background: The maintenance treatment in patients with asthma is based in the use of inhaled corticosteroids as ciclesonide and fluticasone. The objective of this study is to compare the utility between ciclesonide versus fluticasone for treatment of asthma in children.

Methods: A search was done in journals databases of PubMed, EMBASE, LILACS and Cochran, from 1996 to 2009. We searched for studies comparing treatment with ciclesonide versus fluticasone in the treatment of children younger than 18 years diagnosed with persistent moderate and severe asthma. The outcomes measured were: FEV1, peak expiratory flow improvement, absence of nocturnal symptoms, decrease the number of crisis compared to baseline and need to use beta 2 agonist rescue crisis.

Results: When making comparisons between ciclesonide and fluticasone in terms of effectiveness in reducing nocturnal symptoms use of beta 2 agonists, peak expiratory flow improvement and prevention of asthma attacks, the studies reported equal effectiveness for both corticosteroids. Studies provide equally effective in improving FEV1. In terms of local effects, it refers in 2 studies presented the same presentation with both steroids, but there are 2 others less concerned with ciclesonide local effects, but both without presenting conclusive results. With respect to adrenal suppression, there are 2 articles that refer to is less with the use of ciclesonide with fluticasone, one adult on the other hand more equal terms the presence of adrenal suppression with both steroids. However, in all studies to make the overall analysis refers without significant changes. Ciclesonide showed the advantage of not inhibiting cortisol secretion. There were studies that compared quality of life by the result of health-related quality of life (PAQLQ) symptom-free days, days without the use of beta 2 agonists and days without nocturnal awakenings, all refers to both corticosteroids as equivalent. By comparing ciclesonide versus placebo, by applying PAQLQ only one study refers improved quality of life with the steroid.

Conclusions: Ciclesonide is equally effective as fluticasone in the treatment of children with persistent moderate and severe asthma. Besides, bioavailability of ciclesonide allows administration once a day, with less adrenal suppression.

113 Type I and III Interferon Are Attenuated in a Human In Vitro Model of Alternatively Activated Macrophages
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Background: The alternatively activated macrophages (AAM) are induced by IL-4 and IL-13 and are distinct from the IFN-gamma mediated pathway of classically activated macrophages (CAM). The AAM are implicated in a wide
range of physiologic and pathological processes including clearance of helminthic infections, and allergy. They are closely associated with recruiting and amplifying T helper 2 (Th2) lymphocyte response in contrast to Th1-associated CAMs. Wide donor-to-donor variability of human primary monocytes and their limited life span in vitro is a current impediment to investigating human AAM biology and their contribution to enhancing Th2-mediated pathologic inflammation found in asthmatic lungs.

**Methods:** Using the human promonocytic cell line, THP1, we have successfully established a THP1-derived and committed CAM and AAM populations demonstrating typical macrophage-oriented morphological characteristics.

**Results:** Quantitative PCR and ELISA demonstrated that THP1-AAM cell model express classic pathogen neutralizing dectin receptors such as scavenger type mannose receptor (MRC1) and Th2-associated signature chemokines including CCL13, 17, 18 and 22, and are tolerant to TLR4 challenge by LPS treatment in contrast to THP1-CAM which expressed an LPS enhanced expression of pro-inflammatory mediators such as TNF-a, CXCL10 and -11. Furthermore, THP1-AAM cell model expressed 50- to 100-fold lower expression IFN-alpha 4, IFN-beta, and IFN-lambda1 compared to THP1-CAM. Quantitative PCR array revealed that a select group of interferon regulatory factors (IRFs), antiviral genes such as Mx1, and interferon stimulated genes such as ISG15 are down-regulated only in THP-1 AAM cell model upon differentiation or LPS treatment emphasizing its classic infection tolerant phenotype. In addition, IFR4 was found to be up-regulated only in the THP1-AAM model which may point towards its critical role in orchestrating the macrophage lineage commitment towards an alternatively activated phenotype as well as governing its unique cytokine and chemokines expression profile.

**Conclusions:** Compared to the donor variability of primary human monocytes, establishing THP1-AAM and CAM cell models will enable a more rapid and efficient investigation of a spectrum of molecular mechanisms governing innate, classic, and alternative phenotypes in macrophage populations and their role in pathologic processes, in particular allergic inflammation of the upper airways.

**114 A Highly Sensitive and Specific Universal Mirna Profiling Method**

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**Background:** miRNAs can be used as robust biomarkers for diagnosis, staging, prognosis and the response to therapy in various diseases. Although a wide spectrum of miRNA detection techniques have been developed, none can accurately and sensitively perform genome-wide high-throughput miRNA profiling (Chen C, Ridzon DA, Broomer AJ, Zhou Z, Lee DH, Nguyen JT, Barisasin M, Xu NL, et al 2005. Real-time quantification of microRNAs by stem-loop RT-PCR. Nucleic Acids Res. 33:e179). This problem stems from that miRNAs are only ~22 bases, and multiple species of nucleic acids that contain the mature miRNA sequences are present in the total RNA samples that are usually used for miRNA detection.

**Methods:** A novel RT-qPCR miRNA assay (UQmir, universally quantitating miRNA) was developed to overcome the difficulty. This assay requires only one RT reaction and one universal set of multiple hydrolysis probes to detect all miRNAs, using one universal RT primer, a common reverse primer, and individual miRNA-specific forward primers. A computer program (MSPPD, miRNA-specific primer and probe designer) was developed for the assay.

**Results:** The UQmirR has the advantages, but not the disadvantages, of the 2 mostly used miRNA assays. It has the specificity of hydrolysis probe assay and the universal detection of SYBR Green assay. This assay is more sensitive and specific than the commercially available hydrolysis probe assay and SYBR Green assay. Using this method, we have successfully detected 91 out of 96 miRNAs in 0.8 mL of plasma for each miRNA.

**Conclusions:** This approach affords a highly specific, sensitive, economical and convenient system to profile the expression of all known miRNAs.

**115 Caspase-4 Plays a Role in the Activation of the Cryopyrin/ NLRP3 Inflammasome**

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**Background:** The inflammasome is a multi-protein complex which regulates the activation of caspase-1. This activation results in the cleavage and secretion of the IL-1β super family cytokines, IL-1β, IL-18, and IL-33. NLR family-pyrin domain containing- 3 (NLRP3) is a nucleotide binding domain-leucine rich repeat (NLR) family protein responsible for sensitization and oligomerization of the NLRP3 inflammasome complex. Although various damage and pathogen associated patterns have been implicated as stimuli, the exact mechanism of activation has yet to be elucidated. Caspase-5, an inflammatory caspase with similar homology to caspase-1, is a key molecule activation of the NLRP1 inflammasome. Caspase-4, an evolutionary duplicate in humans to murine caspase 12 along with caspase 5, is important in IL-1β processing; its involvement with the NLRP3 inflammasome is unknown. We therefore investigated whether caspase-4 plays a role in the activation of the NLRP3 inflammasome.

**Methods:** Inflammasomes in THP-1 macrophages were activated using Nigericin (10 μg/mL), a bacterial pore causing toxin and NLRP3 inflamma- some activator, in the presence or absence of various concentrations (0.1 μM, 1 μM, and 10 μM) of caspase-4 inhibitor, Z-YVAD-FMK. We analyzed the inflammasome activation, caspase-1 cleavage, and IL-1β release by western blot and ELISA analysis.

**Results:** Our results indicate that inhibition of caspase-4 leads to a dose dependent decrease in IL-1β secretion. In addition, our results show that caspase-4 contributes to IL-1β and caspase-1 cleavage, both of which are hallmark of inflammasome activation.

**Conclusions:** These findings suggest that caspase-4 is important to the activation of the NLRP3 inflammasome. In modulating the inflammasome, caspase-4 appears to be a druggable target for treatment of chronic inflammatory pulmonary conditions such as allergy and asthma.

**116 Genome-Wide Association Studies of Asthma Indicate Opposite Immunopathogenesis Direction From Autoimmune Diseases**

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