

## Cuban Research in Current International Journals

The following selection—alphabetical by title—reflects Cuban publishing in international medical and population health journals over the last quarter on an array of topics.

### Bacterial outer membrane vesicles and vaccine applications.

Acevedo R, Fernández S, Zayas C, Acosta A, Sarmiento ME, Ferro VA, et al. Front Immunol. 2014 Mar 24. doi: 10.3389/fimmu.2014.00121

Vaccines based on outer membrane vesicles (OMV) were developed more than 20 years ago against *Neisseria meningitidis* serogroup B. These nano-sized structures exhibit remarkable potential for immunomodulation of immune responses and delivery of meningococcal antigens or unrelated antigens incorporated into the vesicle structure. This paper reviews different applications in OMV Research and Development (R&D) and provides examples of OMV developed and evaluated at the Finlay Institute in Cuba. A Good Manufacturing Practice (GMP) process was developed at the Finlay Institute to produce OMV from *N. meningitidis* serogroup B (dOMVB) using detergent extraction. Subsequently, OMV from *N. meningitidis*, serogroup A (dOMVA), serogroup W (dOMVW), and serogroup X (dOMVX) were obtained using this process. More recently, the extraction process has also been applied effectively for obtaining OMV on a research scale from *Vibrio cholerae* (dOMVC), *Bordetella pertussis* (dOMVBP), *Mycobacterium smegmatis* (dOMVSM), and BCG (dOMVBCG). The immunogenicity of the OMV has been evaluated for specific antibody induction, and together with functional bactericidal and challenge assays in mice has shown their protective potential. dOMVB has been evaluated with non-neisserial antigens, including with a herpes virus type 2 glycoprotein, ovalbumin, and allergens. In conclusion, OMV are proving to be more versatile than first conceived and remain an important technology for development of vaccine candidates.

### Cancer vaccine characterization: from bench to clinic.

de la Luz K, Rabasa Y, Montesinos R, Fuentes D, Santo JF, Morales O, et al. Vaccine. 2014 Mar 15. doi: 10.1016/j.vaccine.2014.02.017. [Epub ahead of print]

**Background** The development of safe, effective, and affordable vaccines has become a global effort due to its vast impact on overall world health conditions. A brief overview of vaccine characterization techniques, especially in the area of high-resolution mass spectrometry, is presented. It is highly conceivable that the proper use of advanced technologies such as high-resolution mass spectrometry, along with the appropriate chemical and physical property evaluations, will yield tremendous in-depth scientific understanding for the characterization of vaccines in various stages of vaccine development. This work presents the physicochemical and biological characterization of cancer vaccine Racotumomab/alumina, a murine anti-idiotypic antibody that mimics *N*-glycolyl-GM3 gangliosides. This antibody has been tested as an anti-idiotypic cancer vaccine, adjuvated in Al(OH)<sub>3</sub>, in several clinical trials for melanoma, breast, and lung cancer. **Methods** Racotumomab was obtained from ascites fluid, transferred to fermentation in stirred tank at 10 L and followed to a scale up to 41 L. The mass spectrometry was used for the determination of intact molecule, light and heavy chains masses; amino acids sequence analysis, N- and C-terminal, glycosylation and posttranslational modifications. Also we used the DLS for the size distribution and zeta potential analysis. The biological analyses were performed in mice and chickens. **Results** We observed differences in glycosylation pattern, charge heterogeneity and structural stability between in vivo-produced and bioreactor-obtained Racotumomab products. Interestingly, these modifications had no significant impact on the immune responses elicited in two different animal models. **Conclusions** We are demonstrated that this approach could potentially be more efficient and effective for supporting vaccine research and development.

### Challenges of implementing a doctoral program in an international exchange in Cuba through the lens of Kanter's empowerment theory.

Scanlan JM, Hernández CA. Nurse Educ Prac. 2014 Jan 14. [Epub ahead of print]

The literature in international education focuses primarily on the experiences of western students in developing countries, international students in western universities, the development of an educational program in a developing country, or internationalization of curricula in western universities. There is little in the literature that addresses the challenges students and participating faculty face when implementing a graduate program in a developing country. The purpose of this paper is to describe and analyze the challenges of implementing a doctoral program in an international exchange through the lens of Kanter's theory of empowerment.

Recommendations to address these challenges will be made.

### **Efficacy of 5-Nitroimidazoles for the Treatment of Giardiasis: A Systematic Review of Randomized Controlled Trials.**

Pasupuleti V, Escobedo AA, Deshpande A, Thota P, Roman Y, Hernández AV. PLoS Negl Trop Dis. 2014 Mar 13;8(3):e2733.

**Background** Giardiasis is one of the most common causes of diarrheal disease worldwide and 5-nitroimidazoles (5-NI) are the most commonly prescribed drugs for the treatment of giardiasis. We evaluated the efficacy of 5-nitroimidazoles (5-NI) in the treatment of giardiasis in a systematic review of randomized controlled trials (RCTs). **Methodology/Principal Findings** We conducted a comprehensive literature search in PubMed-Medline, Scopus, Web of Science and Cochrane Library for RCTs evaluating the efficacy of 5-NI vs. control (placebo or active treatment) on parasitological cure in patients with parasitologically-demonstrated giardiasis. The search was performed in May 2013 with no language restriction by two authors independently. The efficacy outcome was parasitological cure, and harmful outcomes were abdominal pain, bitter or metallic taste, and headache. We included 30 RCTs (n=3,930). There was a significant and slightly higher response rate with 5-NI in giardiasis treatment (RR 1.06, 95%CI 1.02-1.11, p=0.005). There was high heterogeneity among studies (I<sup>2</sup>=72%). The response rates for metronidazole, tinidazole and secnidazole were similar (RR 1.05, 95%CI 1.01-1.09, p=0.01; RR 1.32 95%CI 1.10-1.59, p=0.003; and RR 1.18 95%CI 0.93-1.449, p=0.18, respectively). On subgroup analyses, the response rates did not vary substantially and high heterogeneity persisted (I<sup>2</sup>=57%-80%). Harmful outcomes were uncommon, and 5-NIs were associated with lower risk of abdominal pain, and higher risk of both bitter or metallic taste and headache. **Conclusions** Studies investigating the efficacy of 5-NI in giardiasis treatment are highly heterogeneous. 5-NIs have a slightly better efficacy and worse profile for mild harmful outcomes in the treatment of giardiasis in comparison to controls. Larger high quality RCTs are needed to further assess efficacy and safety profiles of 5-NI.

### **Gated SPECT Myocardial Perfusion Imaging, Intraventricular Synchronism, and Cardiac Events in Heart Failure.**

Peix A, Karel J, Rodríguez L, Cabrera L, Padrón K, Carrillo R, et al. Clin Nucl Med. 2014 Mar 28. [Epub ahead of print]

**Purpose** The purpose of this study was to evaluate the ability of rest gated SPECT myocardial perfusion imaging (MPI) and intraventricular synchronism, to identify heart failure (HF) patients most likely to experience cardiac events. **Methods** We studied 165 patients with left ventricular ejection fraction of less than 40%, who were divided in 2 groups according to the diagnosis of coronary artery disease (group 1: 136 patients) or not (group 2: 29 patients). All underwent a rest gated SPECT MPI. **Results** In 160 patients, the MPI was abnormal. Mean summed rest score was 17 ± 6 (group 1) versus 10 ± 6 (group 2), P < 0.0001. Mean volumes showed a marked ventricular dilation, slightly higher among nonischemic. The mean value of the phase-derived SD was 70 ± 19 (group 1) versus 59 ± 21 degrees (group 2), P = 0.016. The histogram bandwidth showed no significant differences. Forty-four (39%) of 114 patients showed some kind of event during the follow-up. The more frequent events were HF progression (13%) and acute coronary syndrome (11%). The highest odds ratios for prediction of events were 1.91 (phase SD), 1.66 (etiology), and 1.55 (summed rest score), although the association was not significant. **Conclusions** A rest gated SPECT is a valid approach to identify HF patients most likely to experience cardiac events.

### **Genetic diversity of *Pneumocystis jirovecii* in colonized Cuban infants and toddlers.**

Monroy EX, de Armas Y, Illnait MT, Díaz R, Toraño G, Vega D, et al. Infect Genet Evol. 2014 Jan 9;22C:60–6. doi: 10.1016/j.meegid.2013.12.024. [Epub ahead of print]

*Pneumocystis jirovecii* is a leading cause of opportunistic infections among immunocompromised patients. The aim of this study was to determine the genetic diversity of *P. jirovecii* from colonized Cuban infants and toddlers by analysis of four genetic loci: mitochondrial large subunit (mtLSU) rRNA, cytochrome b (CYB), superoxide dismutase (SOD) and  $\beta$ -tubulin ( $\beta$ -tub). We determined the multilocus profiles based on concatenated genotype data (multilocus genotype; MLG) and nucleotide sequences (multilocus sequence analysis; MLSA) respectively, calculated the discriminatory power of each analysis, and investigated possible associations with demographic and clinical data. Sixteen of 51 PCR-positive nasopharyngeal swab specimens (years 2010–2013) with high *P. jirovecii* load were selected for downstream analysis. In mixed allelic profiles all genotypes/nucleotide sequence patterns were considered separately. All samples could be genotyped based on mtLSU, CYB and  $\beta$ -tub locus. However, the SOD locus could be successfully amplified in only 7/16 (44%) specimens. Eight different *P. jirovecii* MLGs were identified among the 16 cases and eight samples presented identical MLG (MLG 1). Seventeen MLSA profiles were distinguished. No statistical association between genotypes or MLGs and demographic or clinical data could be identified. For MLSA the higher discriminatory power ( $S = 0.976$ ) was observed. The combination of mtLSU, CYB and  $\beta$ -tub loci proved to be useful for

molecular epidemiology studies of *P. jirovecii*. A total of 17 different MLSA profiles observed in 16 specimens indicated high genetic variability of *P. jirovecii* circulating in colonized Cuban infants and toddlers.

#### **HCV-specific immune responses induced by CIGB-230 in combination with IFN- $\alpha$ plus ribavirin.**

Amador Y, Martínez G, Álvarez L, Vasallo C, Dausá M, Aguilar D, et al. World J Gastroenterol. 2014 Jan 7;20(1): 148–62.

**Aim** To analyze hepatitis C virus (HCV)-specific immune responses in chronically infected patients under triple therapy with interferon- $\alpha$  (IFN- $\alpha$ ) plus ribavirin and CIGB-230. **Methods** CIGB-230 was administered in different schedules with respect to IFN- $\alpha$  plus ribavirin therapy. Paired serum and peripheral blood mononuclear cells (PBMC) samples from baseline and end of treatment were analyzed. The HCV-specific humoral response was tested by enzyme-linked immunosorbent assay, neutralizing antibodies were evaluated by cell culture HCV neutralization assays, PBMC proliferation was assayed by carboxyfluorescein succinimidyl ester staining and IFN- $\gamma$  secretion was assessed by enzyme-linked immunospot. Data on virological and histological response and their association with immune variables are also provided. **Results** From week 12 to week 48, all groups of patients showed a significant reduction in mean leukocyte counts. Statistically significant reductions in antibody titers were frequent, but only individuals immunized with CIGB-230 as early add-on treatment sustained the core-IgG response, and the neutralizing antibody response was enhanced only in patients receiving CIGB-230. Cell-mediated immune responses also tended to decline, but significant reductions in IFN- $\gamma$  secretion and total absence of core-specific lymphoproliferation were exclusive of the control group. Only CIGB-230-immunized individuals showed *de novo* induced lymphoproliferative responses against the structural antigens. Importantly, it was demonstrated that the quality of the CIGB-230-induced immune response depended on the number of doses and timing of administration in relation to the antiviral therapy. Specifically, the administration of 6 doses of CIGB-230 as late add-on to therapy increased the neutralizing antibody activity and the *de novo* core-specific IFN- $\gamma$  secretion, both of which were associated with the sustained virological response. **Conclusions** CIGB-230, combined with IFN- $\alpha$ -based therapy, modifies the immune response in chronic patients. The study provides evidence for the design of more effective therapeutic vaccine interventions against HCV.

#### **In vitro Interaction between SURFACEN® and Surfactant Protein A against *Leishmania amazonensis*.**

de Guevara YLL, Hidalgo OB, Faure R, Fidalgo LM. Chemotherapy. 2013 Dec;59(4):247–50.

Leishmaniasis is caused by a parasite of the *Leishmania* genus, affecting more than 12 million people in 98 countries. The control of leishmaniasis remains a serious problem. There are currently no vaccines for leishmaniasis. The drugs available are toxic, expensive and frequently ineffective. The in vitro activity of SURFACEN® and SP-A against *Leishmania amazonensis* was evaluated. The combination of both products resulted in a synergic pharmacology effect, demonstrated by a fractional inhibitory concentration index <0.5. A more effective combination was a SURFACEN/SP-A ratio of 4:1, using a method of fixed ratio. The therapeutic effect of SURFACEN and SP-A as antileishmanial compounds was demonstrated, with a potentiation of activity when they were incubated in conjunction. Our results propose an exploration of these products in order to design new formulations against the *Leishmania* parasite.

#### **Ma-Pi 2 macrobiotic diet and type 2 diabetes mellitus: pooled analysis of short-term intervention studies.**

Porrata C, Hernández M, Ruiz V, Díaz ME, Fallucca F, Bin W, et al. Diabetes Metabol Res Reviews. 2013 Dec. doi:10.1002/dmrr.2519

The macrobiotic, Ma-Pi 2 diet (12% protein, 18% fat, and 70% carbohydrate), has shown benefit in adults with type 2 diabetes mellitus (T2DM). This pooled analysis aims to confirm results from four, 21-day intervention studies with the Ma-Pi 2 diet, carried out in Cuba, China, Ghana, and Italy. Baseline and end of study biochemical, body composition and blood pressure data, were compared using multivariate statistical methods and assessment of the Cohen effect size (d). Results showed that all measured indicators demonstrated significant changes ( $p < 0.001$ ); most of them with a very high ( $d \geq 1.30$ ), or high ( $d = 0.80-1.29$ ) effect size. The global effect size of the diet was; Italy (1.96), China (1.79), Cuba (1.38) and Ghana (0.98). The magnitude of the individual effect on each variable by country, and the global effect by country, was independent of the sample size ( $p > 0.05$ ). Similarly glycemia and glycemic profiles in all four studies were independent of the sample size ( $p = 0.237$ ). The Ma-Pi diet 2 significantly reduced glycemia, serum lipids, uremia and cardiovascular risk in adults with T2DM. These results suggest that the Ma-Pi 2 diet could be a valid alternative treatment for patients with T2DM and point to the need for further clinical studies. Mechanisms related to its benefits as a functional diet are discussed.

### **Prognostic Role of 14F7 Mab Immunoreactivity against N-Glycolyl GM3 Ganglioside in Colon Cancer.**

Lahera T, Calvo A, Torres G, Rengifo CE, Quintero S, Arango MC. J Oncol. 2014; 2014: 482301. doi: 10.1155/2014/482301. Epub 2014 Jan 30

**Purpose** To assess the prognostic role of 14F7 Mab immunoreactivity, against N-Glycolyl GM3 ganglioside, in patients with colon cancer (CC) and to evaluate the relationship between its expression and clinicopathological features. **Methods** Paraffin-embedded specimens were retrospectively collected from 50 patients with CC operated between 2004 and 2008. 14F7 Mab staining was determined by immunohistochemistry technique and its relation with survival and clinicopathologic features was evaluated. **Results** The reactivity of 14F7 Mab was detected in all cases. Most cases had high level of immunostaining (70%) that showed statistical correlation with TNM stage ( $P = 0.025$ ). In univariate survival analysis, level of 14F7 Mab immunoreactivity ( $P = 0.0078$ ), TNM Stage ( $P = 0.0007$ ) and lymphovascular invasion (0.027) were significant prognostic factors for overall survival. Among these variables, level of 14F7 Mab immunoreactivity (HR = 0.268; 95% CI 0.078–0.920;  $P = 0.036$ ) and TNM stage (HR = 0.249; 95% CI 0.066–0.932;  $P = 0.039$ ) were independent prognostic factors on multivariate analysis. **Conclusions** This study is the first approach on the prognostic significance of 14F7 Mab immunoreactivity in patients with colon adenocarcinoma and this assessment might be used in the prognostic estimate of CC, although further studies will be required to validate these findings.

### **Progression of early features of spinocerebellar ataxia type 2 in individuals at risk: a longitudinal study.**

Velázquez L, Rodríguez R, Canales N, Montero JM, Sánchez G, Aguilera R, et al. Lancet Neurol. 2014 Mar 19. doi: 10.1016/S1474-4422(14)70027-4. [Epub ahead of print]

**Background** The effects of *ATXN2* expansion on the nervous system arise before the cerebellar syndrome can be diagnosed; however, progression of the underlying early clinical manifestations is unknown. We aimed to assess progression of the main clinical features in early stages of the spinocerebellar ataxia type 2 (SCA2). **Methods** We did this longitudinal study between Aug 12, 1986, and Sept 3, 2013, in carriers and non-carriers of the SCA2 mutation. We enrolled participants aged 6–60 years who were asymptomatic offspring or siblings of patients with SCA2. Participants were repeatedly assessed (two to seven times) until they presented definite cerebellar syndrome. All participants underwent standardised neurological examinations and electrophysiological (nerve conduction tests and somatosensory evoked potentials) and genetic assessments. **Findings** We enrolled 40 (73%) of 55 eligible participants to the baseline assessment, of whom 21 (13 women and eight men) were carriers of the SCA2 mutation, and 19 (14 women and five men) were non-carriers. Muscle cramps and sensory abnormalities were the most common clinical features in carriers ( $n=17$  [81%] for both features) compared with controls ( $n=3$  [16%] and  $n=4$  [21%], respectively;  $\chi^2=84.58$ ;  $p<0.0001$ , and  $\chi^2=72.03$ ;  $p<0.0001$ , respectively) Both features showed a notable worsening over time and, in 17 (81%) carriers, age at onset was inversely correlated to CAG repeats (cramps:  $r=-0.76$ ,  $p=0.0004$ ; sensory abnormalities:  $r=-0.77$ ,  $p=0.0004$ ). Hyper-reflexia was associated with long time to ataxia onset (mean 5.71 years [SD 5.03]), whereas hyporeflexia was associated with short time (median 1.29 years [range 1–3]). Electrophysiological recordings obtained between 5 and 8 years before ataxia in 11 (52%) carriers showed reduced sensory amplitudes for median nerve (10.34 uV [SD 5.07]) and prolonged mean P40 latency (39.31 ms [2.40]) compared with age-matched and sex-matched controls (20.72 uV [9.08 uV];  $p=0.0085$ , and 35.60 ms [2.05];  $p=0.0023$ , respectively). **Interpretation** Early features of SCA2 are detectable before the onset of the cerebellar syndrome, and are associated with expanded CAG repeats and the time to onset of cerebellar syndrome. These findings could aid early diagnosis and genetic counseling, and also offer physiopathological insights that could help in the implementation of clinical trials in early stages of the disease.

### **Risk factors eczema in infants born in Cuba: a population-based cross-sectional study.**

Suárez R, Venero SJ, de la Mora E, García G, del Valle I, Gámez L, et al. BMC Dermatol. 2014 Mar 25;14(1):6.

**Background** There is a concern that allergic disease in childhood is higher than expected in Cuba. The aim of this study was to determine the risk factors for eczema of infants aged 12–15 months living in Havana. **Methods** We used a cross-sectional epidemiological study design. Data on eczema symptoms and a wide range of lifestyle factors were collected by researcher administered questionnaires. **Results** Data were collected on 1956 children (96% response rate), of whom 672 (34%) were reported as having had eczema. Independent risk factors for eczema included young maternal age (adjusted odds ratio (OR) 0.98 per additional year of age; 95% confidence interval (CI) 0.97–0.99), child's weight (OR 1.13 per additional kg; 95% CI: 1.03–1.25), insect sting allergy (OR 2.11; 95% CI: 1.33–3.35), rodents in the home (OR 1.39; 95% CI: 1.10–1.76), attendance at childcare facilities (OR 1.34; 95% CI: 1.05–1.70) and self-reported mould in the home (OR 1.23; 95% CI: 1.07–1.41). Infant exposure to paracetamol was associated with an increased risk of eczema even



after adjustment for wheeze (OR 1.22; 95% CI: 1.03-1.46). **Conclusion** Despite a very different culture and environment, the consistency of these findings with those from more economically developed countries suggests potential causal associations. The association with paracetamol, even after adjustment for wheeze, suggests that intervention studies are required in young infants, to ascertain if this commonly used anti-pyretic medication increases allergic disease.

#### **Reliability and validity of the Psychopathy Checklist-Revised (PCL-R) in a Cuban prison sample.**

Medina P, Valdés M, Galán L, Vergara S, Couso O. *Salud Mental*. 2013 Dec;36(6):439–44.

The psychometric properties of the PCL-R (Psychopathy Checklist-Revised) have been standardized in numerous countries. This article evaluates whether the PCL-R can also be validated in the Cuban prison population. The sample was made up of 124 male inmates, imprisoned for committing violent crimes. The PCL-R Spanish version by Moltó et al. was applied. The reliability and internal consistency of the scale were consistent with similar investigations. A two-factor structure was obtained. Factor 1 describes Anti-social behavior and Factor 2 describes Interpersonal-Affective traits of the scale. The two factors showed different patterns of correlation with validated instruments to measure personality traits and confirm the reliability of the construct.

#### **Sexual transmission of giardiasis: A neglected route of spread?**

Escobedo AA, Almirall P, Alfonso M, Cimmerman S, Chacín L. *Acta Trop*. 2014 Jan 14. [Epub ahead of print]

Sexually transmitted infections (STIs) are often discussed in the context of syphilis, gonorrhea, herpes, chlamydia and AIDS. However, since the past 30 years of the last century, epidemiology and natural history studies have led to improved understanding of giardiasis as a STI, as a result of oral–anal sexual contact. Studies suggest that *Giardia* is an increasingly recognized infection that may be underdiagnosed under the STI context. Health care providers should maintain a high index of suspicion for *Giardia*, obtain suitable diagnostic tests to identify and screen those at high risk for this infection, institute appropriate therapy, counsel patients regarding treatment compliance, follow-up, encourage partner notification and teach strategies for preventing the transmission of this disease, including the discussion of the risk of enteric infections after oral–anal sexual contact. We summarize some data concerning the research and clinical literature on *Giardia* infection as a STI and identify the specific recommendations for control of giardiasis as STI that available evidence indicates can reduce its transmission.

#### **Specific active immunotherapy with a VEGF vaccine in patients with advanced solid tumors. Results of the CENTAURO antigen dose escalation phase I clinical trial.**

Gavilondo JV, Hernández F, Ayala M, de la Torre AV, de la Torre J, Morera Y, et al. *Vaccine*. 2014 Feb 11. doi: 10.1016/j.vaccine.2013.11.102. [Epub ahead of print]

CIGB-247 is a novel cancer therapeutic vaccine that uses a human VEGF variant molecule as antigen, in combination with a bacterial adjuvant. In mice, CIGB-247 has anti-tumor and anti-metastatic effects. The vaccine induces anti-VEGF blocking antibodies and a cellular response targeting tumor cells producing VEGF, and has proven to be safe in mice, rats, rabbits and non-human primates.

Herein we report the results of a Phase I clinical trial (code name CENTAURO) where safety, tolerance, and immunogenicity of CIGB-247 were studied in 30 patients with advanced solid tumors, at three antigen dose levels. Individuals were subcutaneously immunized for 8 consecutive weeks with 50, 100 or 400 µg of antigen, and re-immunized on week twelve. On week sixteen, evaluations of safety, tolerance, clinical status, and immunogenicity (seroconversion for anti-VEGF IgG, serum VEGF/KDR-Fc blocking ability, and gamma-IFN ELISPOT with blood cells stimulated in vitro with mutated VEGF) were done. Surviving patients were eligible for off-trial additional 4-week re-immunizations with 400 µg of antigen. Immunogenicity and clinical status were again studied on weeks 25 and 49.

Vaccination was shown to be safe at the three dose levels, with only grade 1–2 adverse events. CIGB-247 was immunogenic and higher numbers of individuals positive to the three immune response tests were seen with increasing antigen dose.

Off-protocol long-term vaccination produced no additional adverse events or adverse changes in immunogenicity. Eleven patients are still alive, with overall survivals ranging from 20 to 24 months. Twelve of the thirty patients exhibited objective clinical benefits, and two individuals have complete responses. Most patients with higher survivals are positive in the three immune response tests.

In summary, this is the first clinical testing report of a cancer therapeutic vaccine based on a human VEGF related molecule as antigen. The CIGB-247 vaccine is safe, immunogenic, and merits further clinical development.

#### Toxocariasis in Cuba: A Literature Review.

Sariego I, Kanobana K, Rojas L, Speybroeck N, Polman K, Núñez FA. PLoS Negl Trop Dis. Feb 2012;6(2):e1382.

Human toxocariasis (HT) is a zoonotic disease caused by infection with the larval stage of *Toxocara canis*, the intestinal roundworm of dogs. Infection can be associated with a wide clinical spectrum varying from asymptomatic to severe organ injury. While the incidence of symptomatic human toxocariasis appears to be low, infection of the human population is widespread. In Cuba, a clear overview on the status of the disease is lacking. Here, we review the available information on toxocariasis in Cuba as a first step to estimate the importance of the disease in the country. Findings are discussed and put in a broader perspective. Data gaps are identified and suggestions on how to address these are presented. The available country data suggest that *Toxocara* infection of the definitive dog host and environmental contamination with *Toxocara* spp. eggs is substantial, but information on HT is less conclusive. The availability of adequate diagnostic tools in the country should be guaranteed. Dedicated studies are needed for a reliable assessment of the impact of toxocariasis in Cuba and the design of prevention or control strategies.

#### What are the main environmental exposures associated with elevated IgE in Cuban infants? A population-based study.

Fundora H, Venero SJ, Suárez R, Mora ED, García G, del Valle I, et al. Trop Med Int Health. 2014 Mar 28. doi: 10.1111/tmi.12293. [Epub ahead of print]

**Objective** Immunoglobulin E (IgE) plays a key role in allergy disease pathogenesis, but little is known about the environmental factors associated with higher IgE levels in infants. The aim of this study was to determine the risk factors for elevated serum total IgE infants living in Havana. **Methods** Eight hundred and seventy-seven infants provided blood samples. Data on allergic disease symptoms and a wide range of exposures were collected. **Results** The median IgE was 35IU/ml (interquartile range 13–96). The risk of having an IgE level above the median was higher for children who had been breastfed for 4 months or more (adjusted odds ratio (OR) 1.28; 95% confidence interval (CI): 1.02–1.61) and for children who reported cockroaches in their home (OR 1.30; 95% CI: 1.03–1.63). The risk was lower for children whose mother was in paid employment (OR 0.73; 95% CI: 0.54–0.97 compared with those who did not), for children living in homes where gas and electricity were used for cooking (OR 0.45; 95% CI: 0.32–0.62 compared with electricity only) and for children with domestic pets at birth (OR 0.83; 95% CI: 0.70–1.00). There was no association between paracetamol use and serum IgE levels. **Conclusions** Associations between gas fuel use and maternal employment indicate that IgE levels in early life are lower in children who may be living in relative affluence. The discrepancy in the effect of early exposure to pets or cockroaches may reflect differences in these allergens, or be confounded by relative affluence. Further investigation of this cohort will determine how these effects translate into the expression of allergic disease in later life.