

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. Links to these journal articles may be found at www.medicc.org/mediccreview.

Antiretroviral drug resistance in HIV-1 therapy-naive patients in Cuba. Pérez L, Kourí V, Alemán Y, Abrahantes Y, Correa C, Aragonés C, et al. *Infect Genet Evol.* 2013 Feb 14. [Epub ahead of print]

In Cuba, antiretroviral therapy rollout started in 2001 and antiretroviral therapy coverage has reached almost 40% since then. The objectives of this study were therefore to analyze subtype distribution, and level and patterns of drug resistance in therapy-naive HIV-1 patients. Four hundred and one plasma samples were collected from HIV-1 therapy-naive patients in 2003 and in 2007–2011. HIV-1 drug resistance genotyping was performed in the *pol* gene and drug resistance was interpreted according to the WHO surveillance drug-resistance mutations list, version 2009. Potential impact on first-line therapy response was estimated using genotypic drug resistance interpretation systems HIVdb version 6.2.0 and Rega version 8.0.2. Phylogenetic analysis was performed using Neighbor-Joining. The majority of patients were male (84.5%), men who have sex with men (78.1%) and from Havana City (73.6%). Subtype B was the most prevalent subtype (39.3%), followed by CRF20-23-24_BG (19.5%), CRF19_cpx (18.0%) and CRF18_cpx (10.3%). Overall, 29 patients (7.2%) had evidence of drug resistance, with 4.0% (CI 1.6% – 4.8%) in 2003 versus 12.5% (CI 7.2% – 14.5%) in 2007–2011. A significant increase in drug resistance was observed in recently HIV-1 diagnosed patients, i.e. 14.8% (CI 8.0% – 17.0%) in 2007–2011 versus 3.8% (CI 0.9% – 4.7%) in 2003 (OR 3.9, CI 1.5 – 17.0, $p = 0.02$). The majority of drug resistance was restricted to a single drug class (75.8%), with 55.2% patients displaying nucleoside reverse transcriptase inhibitor (NRTI), 10.3% non-NRTI (NNRTI) and 10.3% protease inhibitor (PI) resistance mutations. Respectively, 20.7% and 3.4% patients carried viruses containing drug resistance mutations against NRTI + NNRTI and NRTI + NNRTI + PI. The first cases of resistance towards other drug classes than NRTI were only detected from 2008 onwards. The most frequent resistance mutations were T215Y/rev (44.8%), M41L (31.0%), M184V (17.2%) and K103N (13.8%). The median genotypic susceptibility score for the commonly prescribed first-line therapies was 2.5. This analysis emphasizes the need to perform additional surveillance studies to accurately assess the level of transmitted drug resistance in Cuba, as the extent of drug resistance might jeopardize effectiveness of first-line regimens prescribed in Cuba and might necessitate the implementation of baseline drug resistance testing.

Bibliotherapy and food cravings control. Rodríguez-Martín BC, Gómez-Quintana A, Díaz-Martínez G, Molerio-Pérez O. *Appetite.* 2013 Feb 13. [Epub ahead of print].

The use of self-help manuals or bibliotherapy could be an effective resource to treat obesity, but their effects on the elaborative processes of food cravings remain unclear. The present study examined whether bibliotherapy can effectively reduce food cravings in an overweight and obese adult population. 80 participants were randomly allocated either to the Self-help Manual group or the Intention-control group. They had to apply each resource over a period of 3 months whenever they felt a craving arise. During the baseline period most of the participants reported grazing as the main cause of their weight gain. Compared to baseline, the results of the third month of the follow-up revealed that intentions had paradoxical effects on food thought suppression, preoccupation with food, negative affect and guilty feelings; but the Self-help Manual promoted positive changes on the food cravings trait and its dimensions, food thoughts suppression, emotional and behavioural reactions to intrusions and BMI. These findings suggest that the Self-help Manual could be useful in reducing food cravings.

Blacks and whites in the Cuba have equal prevalence of hypertension: confirmation from a new population survey. Ordúñez P, Kaufman JS, Benet M, Morejón A, Silva LC, Shoham DA, et al. *BMC Public Health.* 2013 Feb 24;13(1):169.

Background The excess burden of hypertension among blacks has been a prominent feature of the health disparities literature, and many scientists presume it to be a stable and inevitable phenomenon. The underlying causes of this disparity can only be disentangled in a setting in which the population does not experience racial stratification of socioeconomic opportunities. While such conditions of racial equality remain uncommon, they may be approximated in Cuba, a country with a persistent policy of social inclusion over the last 5 decades. **Methods** We report on a 2010–2011 stratified probability sample of those aged 15–74 years from the urban population of Cienfuegos in central Cuba. A total of 1496 adults (880 women and 616 men) were recruited and assessed for blood pressure and anthropometrics according to standardized protocols, as well as medication use, educational attainment and observed skin tone (dichotomized into “black” and “white”). Weighted tabular and regression analyses were conducted to estimate adjusted prevalences of

hypertension (> 140/90 mmHg) and adjusted prevalence odds ratios for contrasts between the two skin color groups. **Results** Mean pressures were higher for men than for women, but overall did not differ importantly between racial groups. About half of all diagnosed hypertensive men were on medication, a proportion that did not vary by racial group. For women, however, adjusted prevalence was somewhat higher among blacks, and treatment and control rates were also somewhat advantaged for white women. **Conclusions** Overall, skin color was unrelated to mean blood pressure or hypertensive status in this population, although among women specifically some racial advantage appears evident in adjusted prevalence and control, and should be investigated further. The overall null result suggests that Cuba may exemplify the social conditions in which racial excess in hypertension, characteristic of much of the western world, is not a necessary reality.

Calibration Results of the First Cuban Capnometer. Milanés A, Folgueras J, Rodríguez JA, Cartaya ME, Portela AE, Escobar D, et al. *IFBME Proceedings.* 2013;39:1491–4.

This paper presents the results of the calibration process of a capnometer fully developed in Cuba. The device measures the partial pressure of CO₂ in the exhaled air by the patient being treated, processes the acquired data and calculates the concentration of CO₂ as a time function during the breathing process as well as the End-tidal CO₂ value, extremely useful for the anesthesiologist to assess the patient status. The calibration method is described and the corresponding results are presented and discussed, complying with the safety requirements established in the IEC 60601-1:1988 and the ISO 21647:2004 medical equipment safety standards. Results are presented that support the criterion of evaluating the design as a good piece of work, since the accuracy of measurements agrees with the values specified in the ISO 21647 particular standard.

Characterization of recombinant antibodies for cancer therapy by infrared spectroscopy. Valdicia AA, Barth A, Batista YR, Kumar S. *Biologicals.* 2013 Jan 3. [Epub ahead of print]

Fourier transform infrared (FTIR) spectroscopy was used to study the structure of the recombinant antibodies 1E10, anti-CD20 and hR3, which are used as anti-cancer therapeutic drugs. We tested their sensitivity against different conditions and treatments such as pH, temperature, freeze-thaw cycles and drying, which

are relevant for the practical usefulness of the drugs. All antibodies were stable against moderate temperature increases (up to 50 °C) and pH changes (range 5-9). 1E10 was sensitive to extreme pH values (pH 3 and 12), whereas hR3 was most sensitive to temperature (at and above 60 °C). We did not observe any significant changes upon freeze-thaw and drying treatments. The secondary structure content of all three antibodies was estimated to be similar to that of IgG with ~64% β -sheet, 0% α -helix and ~36% other structure.

Diffusion of community empowerment strategies for *Aedes aegypti* control in Cuba: a muddling through experience. Pérez D, Lefèvre P, Castro M, Toledo ME, Zamora G, Bonet M, et al. Soc Sci Med. 2013 Feb 13. [Epub ahead of print].

Effective participatory strategies in dengue control have been developed and assessed as small-scale efforts. The challenge is to scale-up and institutionalize these strategies within dengue control programs. We describe and critically analyze the diffusion process of an effective empowerment strategy within the Cuban *Aedes aegypti* control program, focusing on decision-making at the national level, to identify ways forward to institutionalize such strategies in Cuba and elsewhere. From 2005 to 2009, we carried out a process-oriented case study. We used participant observation, in-depth interviews with key informants involved in the diffusion process and document analysis. In a first phase, the data analysis was inductive. In a second phase, to enhance robustness of the analysis, emerging categories were contrasted with Rogers' five-stage conceptual model of the innovation-decision process, which was eventually used as the analytical framework. The diffusion of the empowerment strategy was a continuous and dynamic process. Adoption was a result of the perceived potential match between the innovative empowerment strategy and the performance gap of the *Aedes aegypti* control program. During implementation, the strategy was partially modified by top level *Aedes aegypti* control program decision-makers to accommodate program characteristics. However, structure, practices and organizational culture of the control program did not change significantly. Thus rejection occurred. It was mainly due to insufficient dissemination of know-how and underlying principles of the strategy by innovation developers, but also to resistance to change. The innovation-diffusion process has produced mitigated results to date, and the control program is still struggling to find ways to move forward. Improving the innovation strategy by providing the necessary knowledge about the innovation and addressing control program organizational changes is crucial for successful diffusion of empowerment strategies. Issues highlighted in this particular experience might be relevant in the innovation-diffusion process of other complex innovations within health systems.

Drugs for treating giardiasis. Granados CE, Reveiz L, Uribe LG, Criollo CP. Cochrane Data-

base Syst Rev. 2012 Dec 12; 12:CD007787. doi: 10.1002/14651858.CD007787.pub2

Background Giardiasis infection may be asymptomatic, or can cause diarrhoea (sometimes severe), weight loss, malabsorption, and, in children, failure to thrive. It is usually treated with metronidazole given three times daily for five to 10 days. **Objectives** To evaluate the relative effectiveness of alternative antibiotic regimens for treating adults or children with symptomatic giardiasis. **Search methods** We searched the Cochrane Infectious Disease Group Specialized Register, the Cochrane Central Register of Controlled Trials (CENTRAL) (Issue 6 2012); MEDLINE, EMBASE, LILACS and the International Clinical Trials Registry Platform Search Portal (3 July 2012). **Selection criteria** We included randomized controlled trials (RCT) comparing metronidazole administered for five to 10 days with any of the following drugs: metronidazole (single dose), tinidazole, albendazole, mebendazole, and nitazoxanide. The primary outcomes were parasitological and clinical cure. **Data collection and analysis** Two authors independently assessed studies for inclusion, performed the risk of bias assessment, and extracted data. We summarized data using risk ratios and mean differences and we presented the results in forest plots and performed meta-analyses where possible. We assessed heterogeneity using the Chi(2) test, I(2) statistic and visual inspection; and we explored this by using subgroup analysis. We assessed the quality of evidence by using the GRADE approach. **Main results** We included 19 trials, involving 1817 participants, of which 1441 were children. Studies were generally small, with poor methods reporting. Most reported parasitological outcomes rather than clinical improvement. Ten trials, from India, Mexico, Peru, Iran, Cuba, and Turkey, compared albendazole (400 mg once daily for five to 10 days) with metronidazole (250 mg to 500 mg three times daily for five to 10 days). This once-daily regimen of albendazole is probably equivalent to metronidazole at achieving parasitological cure (RR 0.99, 95% CI 0.95 to 1.03; 932 participants, 10 trials; moderate quality evidence), and improving symptoms (RR 0.98, 95% confidence interval (CI) 0.93 to 1.04; 483 participants, five trials; moderate quality evidence), but the duration of follow-up was short (two to three weeks). Albendazole probably has fewer side effects than metronidazole (gastrointestinal side effects: RR 0.29, 95% CI 0.13 to 0.63; 717 participants, eight trials; moderate quality evidence; neurological side effects: RR 0.34, 95% CI 0.18 to 0.64; 453 participants, five trials; low quality evidence). Five trials from Turkey, Spain and the UK compared mebendazole (200 mg three times daily for five to 10 days) with metronidazole (5 mg/kg (or 250 mg) three times daily for five to 10 days). These trials were small in size, and at high risk of bias. Consequently, reliable conclusions on the relative effectiveness cannot be made (very low quality evidence). Five further trials, from Iran, Spain and Peru, have evaluated shortened regimens of tinidazole (single dose; 179 participants, three trials), metronidazole (single dose; 55

participants, one trial), and nitazoxanide (three days; 55 participants, one trial). Again, these trials were at high risk of bias and too small to reliably detect or exclude important differences (very low quality evidence). **Authors' conclusions** Albendazole may be of similar effectiveness to metronidazole, may have fewer side effects, and has the advantage of a simplified regimen. Large, high quality trials, assessing clinical outcomes (such as diarrhoea) will help assess further alternatives.

Effects of policosanol on the recovery of ischemic stroke: a randomized controlled study. Sánchez J, Fernández L, Illnait J, Arruzabala ML, Molina V, Mas R, et al. J Pharmacol. 2012 Nov-Dec;2(6):14-24.

Background Antiplatelet therapy lowers the risk of recurrent stroke. Policosanol, a mixture of 8 high molecular weight sugar cane wax alcohols, has shown to reduce platelet aggregation. **Objectives** To investigate whether the therapy with policosanol plus aspirin (AS) could improve the neurological outcome as compared to placebo + AS in patients with a recent ischemic stroke. **Methods** Ninety-two (92) patients with a modified Rankin Scale score (mRSs) ≥ 2 - ≤ 4 after suffering an ischemic stroke within 30 days before enrollment were randomized to placebo or policosanol (20 mg/day) + AS (125 mg/day) (pla + AS or poli + AS) for 24 weeks. The primary efficacy variable was to obtain a better stroke outcome (mRSs ≤ 1) as compared to pla + AS. Reduction of platelet aggregation was a secondary variable. **Results** After 12 and 24 weeks on therapy, the rates of patients treated with poli + AS (10/46, 21.7% and 32/46, 69.6%, respectively) who achieved mRSs ≤ 1 were significantly ($p < 0.01$ and $p < 0.0001$, respectively) greater than those treated with pla + AS (0/46, 0.0% and 7/46, 15.2%, respectively). Poli + AS treatment given for 6 weeks reduced significantly ($p < 0.00001$ vs baseline, $p < 0.01$ vs pla + AS) the mean mRSs value (24.1%), and this effect improved thereafter, so that it was reduced by 31.0% and 55.2% after 12 and 24 weeks on therapy, respectively. Poli + AS treatment also reduced significantly arachidonic acid- and adenosine diphosphate- induced platelet aggregation by 41.0% and 24.8%, respectively. Treatments were well tolerated. There were not withdrawals due to adverse experiences. **Conclusions** In patients with recent ischemic stroke, poli + AS treatment improved the neurological recovery and decreased platelet aggregation as compared to pla + AS.

High Mobility Group Box 1 Protein as an Auxiliary Biomarker for Dengue Diagnosis. Allonso D, Vázquez S, Guzmán MG, Mohana-Borges R. Am J Trop Med Hyg. 2012 Dec 26. [Epub ahead of print]

Despite the availability of many methods for rapid and early diagnosis of dengue, there is still a need to develop new approaches that not only combine low cost, specificity, and sensitiv-

ity, but also are capable of accurately detecting secondary infection in the early stages of the disease. We report the potential of the high mobility group box 1 protein as an auxiliary biomarker for early dengue diagnosis. We tested a 205-sample serum panel that included negative and positive samples from primary and secondary dengue cases, as well as samples from patients with dengue-like symptoms. We observed that high mobility group box 1 protein was generally detected only in dengue-positive samples for persons with primary and secondary infections. These results highlight the possibility of using this endogenous molecule as an auxiliary biomarker to aid in dengue detection and improve current methods for early diagnosis of dengue.

HLA-B27 and Clinical Features of Acute Anterior Uveitis in Cuba. Torres S, Borges S, Ariles A. *Ocul Immunol Inflamm.* 2012 Dec 19. [Epub ahead of print]

Background There are few data about the epidemiology of acute anterior uveitis (AAU) from Latin America. In Cuba, the genetic admixture of the population could modify the HLA-B27-AAU association. In this study, the authors compared the distribution of the HLA-B27 allele in patients and controls and described some clinical outcomes. **Materials and Methods** The clinical features of patients were collected from their medical records. HLA-B27 genotyping was performed using the polymerase chain reaction. HLA-B27 allele distribution was compared between patients and controls. **Results** HLA-B27 allele was present in 55.4% of the patients and 0.87% of the controls. AAU HLA-B27 positivity was associated with males, frequent episodes, and a systemic disease. There is no difference in ocular complications between HLA-B27-positive and -negative patients. **Conclusions** Results from this study are similar to data described in other countries. HLA-B27 allele distribution in controls is lower than other reports in Caucasian populations.

Human antibodies reactive to NeuGcGM3 ganglioside have cytotoxic anti-tumor properties. Rodríguez-Zhurbenko N, Martínez D, Blanco R, Rondón T, Grifán T, Hernández AM. *Eur J Immunol.* 2013 Jan 14. doi: 10.1002/eji.201242693. [Epub ahead of print]

N-glycolylated gangliosides are not naturally expressed in healthy human tissues but are overexpressed in several tumors. We demonstrate the existence of antibodies that bind (N-glycolylneuraminyllactosylceramide (NeuGcGM3) and are detectable in the sera from 65 of the 100 donors (65%) tested by ELISA. From those 65 NeuGcGM3 antibody-positive donors, 35 had antibodies that were able to recognize and kill NeuGcGM3-expressing tumor cells by a complement-mediated mechanism. After complement inactivation, 11 of the 35 positive sera showed a direct cytotoxic effect on the tumor

cells. This complement-independent cytotoxicity was dependent on the presence of antigen on the membrane and resembles an oncotic necrosis cell death. Both the levels of anti-NeuGcGM3 antibodies in the sera as well as the percentage of healthy donors with this immunity decreased with age of the donor. In contrast to age and gender-matched healthy donors, we could only detect low reactivity against NeuGcGM3 in the sera of 6 out of 53 non-small cell lung cancer patients. These results suggest the existence of antibodies against NeuGcGM3 with anti-tumor immune surveillance functions, reinforcing the importance of N-glycolylated gangliosides as anti-tumor targets.

Intestinal parasites in children from a day care centre in Matanzas City, Cuba. Cañete R, Díaz MM, Avalos García R, Laúd Martínez PM, Manuel Ponce F. *PLoS One.* 2012;7(12):e51394.

Background Intestinal parasitic infections are widely distributed throughout the world and children are the most affected population. Day care centres are environments where children have proven to be more susceptible to acquiring IP. **Methods and Principal Findings** A cross-sectional study was carried to determine the prevalence of intestinal parasites in stool samples among children who attend to a day care centre in an urban area of Matanzas city, Cuba, from March to June 2012. 104 children under five years old were included on the study after informed consent form was signed by parents or legal guardians. Three fresh faecal samples were collected from each child in different days and were examined by direct wet mount, formalin-ether, and Kato-Katz techniques. Data relating to demography, socioeconomic status, source of drinking water, and personal hygiene habits were also collected using a standardized questionnaire. In total, 71.1% of children harbored at least one type of intestinal parasite and 47 (45.2%) were infected by more than one species. *Giardia duodenalis* and *Blastocystis* sp. were the most common parasites found, with prevalence rates of 54.8% and 38.5% respectively. **Conclusions** Despite public health campaigns, improvement in the level of education, and the availability of and access to medical services in Cuba infections by intestinal protozoan is high in this centre. Almost nothing is published regarding intestinal parasites in Matanzas province during the last 40 years so this work could also be the initial point to carry out other studies to clarify the IP status in this region.

Parental Perceptions of Giardiasis: A Study in an Outpatient Paediatric Hospital Setting in Havana, Cuba. Almirall P, Escobedo AA, Salazar Y, Alfonso M, Ávila I, Cimerman S, et al. *Preventive Med.* 2013 Jan

Background *Giardia lamblia* is an important cause of diarrhoeal disease throughout the world. Giardiasis—a mild and self-limiting disease that

this protozoan causes—is perceived as a harmful disease. **Aim** To explore the general level of awareness about giardiasis, clinical features, mode of transmission, prevention, and consequences and describe the sources and channels of information caregivers would prefer using to be informed about this disease. **Methods** A cross-sectional survey was conducted among caregivers attending to the outpatient paediatric hospital setting in Havana. **Results** A total of 202 caregivers were interviewed. Nearly 73% considered giardiasis as a modern problem, and 39% considered that it could be a fatal disease. Although 76.7% were aware that small intestine is the organ affected, other localizations were cited. Abdominal pain and diarrhea were recognized as the commonest symptoms. Around one-third could identify that giardiasis may spread through drinking unboiled water and unwashed vegetables other incorrect ways were mentioned; respondents with more than 12 years of formal education were more likely to have better knowledge. **Discussion** Strategies to control giardiasis need to be through an integrated approach aiming at boosting caregivers' knowledge and encouraging healthcare workers to act as a readily available source for health information.

Priming after a Fractional Dose of Inactivated Poliovirus Vaccine. Resik S, Tejada A, Sutter RW, Díaz M, Sarmiento L, Alemañi N, et al. *N Engl J Med.* 2013 Jan 31;368(5):416–24.

Background To reduce the costs of maintaining a poliovirus immunization base in low-income areas, we assessed the extent of priming immune responses after the administration of inactivated poliovirus vaccine (IPV). **Methods** We compared the immunogenicity and reactogenicity of a fractional dose of IPV (one fifth of a full dose) administered intradermally with a full dose administered intramuscularly in Cuban infants at the ages of 4 and 8 months. Blood was collected from infants at the ages of 4 months, 8 months, 8 months 7 days, and 8 months 30 days to assess single-dose seroconversion, single-dose priming of immune responses, and two-dose seroconversion. Specimens were tested with a neutralization assay. **Results** A total of 320 infants underwent randomization, and 310 infants (96.9%) fulfilled the study requirements. In the group receiving the first fractional dose of IPV, seroconversion to poliovirus types 1, 2, and 3 occurred in 16.6%, 47.1%, and 14.7% of participants, respectively, as compared with 46.6%, 62.8%, and 32.0% in the group receiving the first full dose of IPV ($P < 0.008$ for all comparisons). A priming immune response to poliovirus types 1, 2, and 3 occurred in 90.8%, 94.0%, and 89.6% of participants, respectively, in the group receiving the fractional dose as compared with 97.6%, 98.3%, and 98.1% in the group receiving the full dose ($P = 0.01$ for the comparison with type 3). After the administration of the second dose of IPV in the group receiving fractional doses, cumulative two-dose seroconversion to poliovirus types 1, 2, and 3 occurred in 93.6%, 98.1%, and 93.0% of participants, respectively, as compared with 100.0%, 100.0%, and 99.4%

in the group receiving the full dose ($P < 0.006$ for the comparisons of types 1 and 3). The group receiving intradermal injections had the greatest number of adverse events, most of which were minor in intensity and none of which had serious consequences. **Conclusions** This evaluation shows that vaccinating infants with a single fractional dose of IPV can induce priming and seroconversion in more than 90% of immunized infants. (Funded by the World Health Organization and the Pan American Health Organization; Australian New Zealand Clinical Trials Registry number, ACTRN12610001046099.)

Oxidative Stress Markers in Children with Autism Spectrum Disorders. González ME, Díaz ML, Vera H, Maragoto C, Noris E, Blanco L, et al. *BJM Med Res.* 2013 Jan;3(2):301-7.

Aims The etiology of autism spectrum disorders (ASD) remains elusive, but oxidative stress has been suggested to play a pathological role. The understanding of the potential role of oxidative stress in the etiopathogenesis of autism would be very useful for earlier clinical, therapeutic or preventive strategies. **Sample** To evaluate the redox status, we quantified the activity of the antioxidant enzyme catalase (CAT), glutathione concentration (GSH) and markers of damage to biomolecules, malonyldialdehyde (MDA) and 8-hydroxy-2-deoxyguanosine (8OHdG) in peripheral blood samples. **Place and Duration of Study** **Sample** Department of Neuropediatrics and Technology Science Division. International Center for Neurological Restoration (CIREN), Havana, Cuba. May 2011-June 2012. **Methodology** We included 45 children with autism (36 males and 9 females, age-range from 3 to 11 years). 42 children of the same age were selected as a control group. The diagnosis of autism was made based on the criteria of autistic disorders as defined in the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM IV) (American Psychiatric Association, 1994). **Results** The total GSH content in autistic patients was significantly lower compared with the control group (0.24 ± 0.162 vs. 0.94 ± 0.115 , respectively, $p \leq 0.001$). Higher serum CAT, MDA and 8OHdG levels were found in children with autism compared with controls (CAT, 2.836 ± 0.479 vs. 0.689 ± 0.157 , $p \leq 0.001$; MDA 8.6 ± 0.5 vs. 1.76 ± 0.33 $p \leq 0.001$, and 8OHdG

13.134 ± 1.33 vs. 1.46 ± 0.326 , $p \leq 0.001$). **Conclusion** The present study supports the notion that oxidative stress is associated with autism, but additional researches are needed to investigate how it may contribute to autistic pathophysiology and these studies are currently in progress.

The Antitumor Peptide CIGB-552 Increases COMMD1 and Inhibits Growth of Human Lung Cancer Cells. Fernández Massó JR, Argüelles BO, Tejada Y, Astrada S, Garay H, Reyes O, et al. *J Amino Acids.* 2013;2013:251398. doi: 10.1155/2013/251398. Epub 2013 Jan 16.

We have demonstrated that the peptide L-2 designed from an alanine scanning of the Limulus-derived LALF32-51 region is a potential candidate for the anticancer therapy and its cell-penetrating capacity is an associated useful property. By the modification in the primary structure of L-2, a second-generation peptide (CIGB-552) was developed. However, the molecular mechanism underlying its cytotoxic activity remains partially unknown. In this study, it was shown that CIGB-552 increases the levels of COMMD1, a protein involved in copper homeostasis, sodium transport, and the NF- κ B signaling pathway. We found that CIGB-552 induces ubiquitination of RelA and inhibits the antiapoptotic activity regulated by NF- κ B, whereas the knockdown of COMMD1 blocks this effect. We also found that CIGB-552 decreases the antioxidant capacity and induces the peroxidation of proteins and lipids in the tumor cells. Altogether, this study provides new insights into the mechanism of action of the peptide CIGB-552, which could be relevant in the design of future anticancer therapies.

The Cuban Twin Registry: Initial Findings and Perspectives. Marcheco-Teruel B, Cobas-Ruiz M, Cabrera-Cruz N, Lantigua-Cruz A, García-Castillo E, Lardoyt-Ferrer R, et al. *Twin Res Hum Genet.* 2013 Feb;16(1):98-103.

The Cuban Twin Registry is a nation-wide, prospective, population-based twin registry comprising all zygosity types and ages. It was initiated in 2004 to study genetic and environmental contributions to complex dis-

eases with high morbidity and mortality in the Cuban population. The database contains extensive information from 55,400 twin pairs enrolled in the period 2004-2006. Additionally, 2,600 new multiple births have been included from 2007 to date. In the past 4 years, more than 130 studies have been carried out using the registry with a classical genetic epidemiological approach in which concordance rates for monozygotic and dizygotic twins and heritability of various disease traits were estimated. This article summarizes the history, registry's methodology, recent research findings, and future directions of work.

The role of glial cells in Alzheimer's disease: Potential therapeutic implications. Lopategui Cabezas I, Herrera Batista A, Pentón Rol G. *Neurologia.* 2012 Dec 13. pii: S0213-4853(12)00275-7. doi: 10.1016/j.nrl.2012.10.006

Introduction Alzheimer's (AD) disease is a complex neurodegenerative disease characterized by inflammation, neurotoxicity, oxidative stress, and reactive gliosis. Microglia and astrocytes not only act as antigen-presenting cells, but they also function as effector cells releasing pro-inflammatory molecules that promote excitotoxicity and neurodegeneration. **Objective** In the present review we discuss the role of glia, specifically microglia and astrocytes, in the pathophysiology of AD and possible therapeutic implications. **Development** The growing body of evidence suggesting that microglia and astrocytes play a pathogenic role and activate inflammation pathways, the neurotoxic factors released by these cells when activated, and the way these factors may disrupt the homeostasis of the central nervous system all support the hypothesis that glia-induced inflammation exacerbates AD. **Conclusions** Inhibiting inflammation by deactivating glial cells may reduce the production of factors which contribute to neurotoxicity, and therefore result in clinical improvement. Microglia and astrocytes are therapeutic targets for the development of new drugs to combat this disease. Therapeutic strategies designed to counter the detrimental effects of overactivation of these cell populations should be investigated. 