

study in the formation of cordierite.

SEM observation and analysis of the micrographs taken at magnifications of 1,000X, 5,000X, 10,000X and 15,000X of the test specimen sintered at 1000°C for 2 and 3 hours revealed a microstructures consisting mostly of euhedral and subhedral particles with sizes approximately in the range of 1-10 μm . As the sintering temperature increases to 1100°C of the same sintering time, the micrographs revealed a microstructures consisting of partially melted euhedral grain particles and was started to transform into spherical shape. Open pores between particles could also be observed in the micrographs. The presence of pores between particles can be concluded that the sintering reaction was not completely achieved at the sintering temperature range of 1000-1100°C and the individual particles did not formed a dense body.

Keywords: solid-state sintering, x-ray analysis, scanning electron microscopy, crystalline phases, and microstructures

HEALTH SCIENCES

HSD No. 1

MICROBIOLOGICAL ASSESSMENT OF DRINKING WATER QUALITY OF SELECTED BARANGAYS IN ILAGAN CITY

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Microbiological drinking water quality using Most Probable Number (MPN) Method and Heterotrophic Plate Count (HPC) was assessed from two water sources in each of three selected barangays of Iligan City from April to June 2005. Two pumping stations distribute treated water to these barangays: Pumping Station 1 for Barangays Palao and Hinaplanon, and Pumping Station 2 for Barangay San Miguel with a water source from a farther and higher elevation.

MPN test showed that 28% of 108 water samples yielded total coliforms and only 10% were confirmed to have faecal coliform. Abrupt increase in MPN coliform was observed in Sites A and B from Palao on the second of six samplings, and stresses the unpredictability of possible faecal contamination which might pose a potential health risk. Water samples from Sites C and D of San Miguel displayed irregular and varying MPN coliform levels which can be attributed to a probable

breach in the piping system since the source is farther from the point of use and may have resulted to an increase in assimilable organic carbon. Sites E and F in Hinaplanon yielded water samples which consistently showed very minimal levels of coliform thus are considered to be microbiologically safe to drink.

Coliforms are not the only potentially pathogenic bacteria which may be isolated from drinking water. HPC is mainly used as an operational tool to screen the efficacy of disinfection procedures. International standards for acceptable HPC for microbiologically safe drinking water vary from less than 100 to 500 cfu/ml. Fifty-nine of the samples exhibited values greater than 100 cfu/ml, and thirty-five of them exceeded 500 cfu/ml. Only forty-nine of the total collected water samples had less than 100 cfu/ml. HPC levels exceeding acceptable standards were obtained from San Miguel as the farthest from the water source, whereas Hinaplanon holds the lowest number of colony counts .

Keywords: Most Probable Number (MPN), Heterotrophic Plate Count (HPC), faecal coliform

HSD No. 2

HEALTH STATUS OF SELECTED FACULTY AND STUDENTS OF ILIGAN CITY ASSESSED THROUGH “THE 20-MINUTE HEALTH CHECK” SCREENING PROGRAM

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A comprehensive screening program known as “The Twenty Minute Health Check” designed to test every aspect of one’s lifestyle—from eating habits to susceptibility to stress developed by Dr. Vernon Coleman in 2004 was used in evaluating the health status of the members of the faculty and students of MSU-IIT, Iligan City. In this survey, one is required to answer the 120 questions where points will be collected for the answers given and the total points received for the 120 questions will give one an automatic health check. Every score has a corresponding health status – excellent health, heart, respiratory, digestive, joints, stress, alcohol problems and predisposition to cancer. A separate survey on monozygotic and dizygotic twins was also done to evaluate possible concordance of the scores.

A total of six hundred (600) students, two-hundred ninety-four (294) members of the faculty and staff, sixty (60) twins were the respondents of the study. Results of the study showed similar patterns in both faculty and student respondents. Both groups have similar results for scores under the very unacceptable and unacceptable range and these were high for heart, digestive and stress problems and relatively low for joint, respiratory, cancer and alcoholism. The results on twins (pooled) showed scores of the same range with the faculty and students and concordance patterns cannot be established as yet as the number of twin pairs who participated in the research are still very few. Nevertheless, it is interesting to note in this study that both faculty and students alike have similar patterns in terms of susceptibility to certain health problems. An on-going study is being done to evaluate the health status of those individuals working in other schools and those not working in the academic community to see what particular health problems are common to these groups.

Keywords: health status, screening

HSD No. 3

PREVALENCE AND SUSCEPTIBILITY PROFILES OF COMMUNITY-ACQUIRED METHICILLIN-RESISTANT *Staphylococcus aureus* ISOLATES FROM TERTIARY STUDENTS OF ILIGAN CITY

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Methicillin-resistant *Staphylococcus aureus* (MRSA) is a pathogen that has been recovered from and associated with hospitals and health care facilities. However, there has been increasing number of studies which has indicated that MRSA is prevalent in the community, thus, making community-acquired methicillin-resistant *Staphylococcus aureus* (CA-MRSA) an emerging threat worldwide. This community-based study was undertaken to assess the prevalence of CA-MRSA among healthy college students with no apparent risk factors for MRSA.

Sixty-six methicillin-resistant *Staphylococcus aureus* isolates were detected from the facial swab cultures of 116 individuals included in the study. The *S. aureus* isolates were identified by traditional methods: gram positive staphylococci, manitol fermentor, catalase positive, coagulase positive and oxacillin-resistant. Stan-

standard disc diffusion method as proposed by the Clinical Laboratory Standards Institute (CLSI) was employed to determine the susceptibility profiles of the MRSA isolates to clindamycin, erythromycin and tetracycline. Seventeen percent of the MRSA isolates (11/66) were found to be resistant to erythromycin, 14% (9/66) were resistant to clindamycin and 5% (3/66) were resistant to tetracycline. Only one isolate exhibited resistance to all three antibiotics. The susceptibility profiles of the CA-MRSA are consistent with the observation that CA-MRSA strains are more susceptible to antibiotics than hospital-acquired MRSA strains. The detection of significant number of CA-MRSA isolates supports the postulation that healthy individuals of the society are the highest reservoir of antimicrobial resistant bacteria.

Keywords: *Staphylococcus aureus*, Antibiotic Resistance, Community-Acquired Methicillin-Resistant *Staphylococcus aureus* (CA-MRSA), Antibiotic Disc Diffusion Method (Kirby-Bauer)

HSD No. 4

MULTI-DRUG RESISTANT *Staphylococcus aureus* FROM WASTE PICKERS OF ILIGAN CITY

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An estimated twenty-five percent of the Philippine population is urban poor who reside in slums near open garbage dumps. Majority of these individuals resort to waste-picking as means of livelihood often ignoring the significant occupational risk of exposure to hospital wastes. One possible origin of community-acquired multidrug-resistant *Staphylococcus aureus* (CA-MDRSA) are hospital strains that may be carried into the community where then they are spread from person to person. This study sought to investigate the prevalence of MDRSA among local waste pickers.

Forty-six *S. aureus* isolates were detected from one hundred seven waste-pickers of Iligan City. Susceptibility profiles of all *S. aureus* isolates to antimicrobial agents were determined and interpreted according to Clinical Laboratory Standards Institute (formerly NCCLS) published guidelines. The resistance of the isolates were 100%, 44%, 9% and 7% to oxacillin, ampicillin, clindamycin and tetracycline, respectively. The results suggest that all isolates are methicillin-resistant *S. aureus* (MRSA) and supports the increasing reports of detecting CA-MRSA.

However, the CA-MRSA isolates from the respondents could not be categorized as true CA-MRSA due to the possibility that it might have originated from the individuals' direct contact with infected hospital wastes during scavenging. Hospital-acquired MRSA are different from CA-MRSA in the sense that these isolates are multi-drug resistant.

Fifty percent of the CA-MRSA from the waste-pickers exhibited multi-drug resistance (MDR) against two to three (oxacillin, clindamycin and ampicillin) of the four chosen antibiotics and are considered MDR-MRSA. There is then a high possibility that the original MRSA isolate of this group may have come from hospitals or health-care facilities. However, the other 50% of the MRSA isolates are non-multidrug resistant (NMDR-MRSA) which exhibited the characteristic trait of a true CA-MRSA which is still susceptible to most antibiotics. The detection of significant numbers of MRSA and MDRSA is of great concern since these individuals are asymptomatic and may further spread these resistant strains in the community.

Keywords: Waste pickers, *Staphylococcus aureus*, Methicillin-resistant *S. aureus* (MRSA), Community-Acquired MRSA (CA-MRSA), Multi-drug Resistant MRSA

HSD No. 5

THE INCIDENCE OF METHICILLIN-RESISTANT *Staphylococcus aureus* (MRSA) IN BATANGAS REGIONAL HOSPITAL (BRH)

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Methicillin-resistant *Staphylococcus aureus* (MRSA) is one of the major concerns in the healthcare system. The rise in MRSA infections was associated with epidemics in large teaching hospitals and in general hospitals. Scientific studies have shown the increasing incidence and the persistence of MRSA cases in different hospitals in our country. This study was conducted to determine the incidence of Methicillin-Resistant *Staphylococcus aureus* (MRSA) in Batangas Regional Hospital (BRH) where the identification of MRSA is not performed. From November 2003 to July 2004, four hundred one (401) *S. aureus* clinical isolates were identified based on morphological and biochemical characteristics. Using the NCCLS oxacillin-salt agar screening test and agar dilution method, 32.17% (129/401) of the isolates were confirmed to be MRSA in which the minimum inhibitory concentration (MIC) is 8 mg/mL up to >64 mg/mL. According to the demographic and clinical characteristics of patients with *Staphylococcus aureus* infections and MRSA infections, many of the patients were newborns and children below 2 years old;

admitted in Pediatrics and Neonatal Intensive Care Unit (NICU); have stayed long in the hospital; and have recovered well from the infections. Half of the patients have one or more co-morbidities. The *S. aureus* and MRSA infections were acquired in the hospital but most infections were acquired from the community. The length of stay of the patients in BRH was found to be correlated with the spread of MRSA; however, the age, sex location of confinement and underlying conditions of the patients failed to correlate with the spread of MRSA in BRH due to insufficient number of MRSA isolates (129/401). Most of the clinical isolates were obtained from the blood specimens.

Keywords: Methicillin-resistant *Staphylococcus aureus*, MRSA, Incidence, MIC

HSD No. 6

ASTHMATIC CHILDREN HOME MONITORING SYSTEM

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In the Philippines, asthma affects over six million children and is ranked 32nd in “self-reported asthma” in the world. Recent studies have shown that monitoring of asthma severity at home combined with adequate patient education can reduce the incidence of asthma exacerbation and subsequent hospitalization. Asthmatic Children Home Monitoring System (ASCHOMS) is created with the objective of allowing parent or guardian to manage his child’s asthma at home. It is a web-based application which allows physicians to maintain the medical records of their asthmatic patients, create an action or treatment plan for the asthma self-management of the patient. It also allows patient’s guardian or parent to monitor and to inform the physician online or via short messaging system (SMS) the clinical symptoms, spirometry and peak flow measurements. In return, the physician can assess the condition of the patient and create an appropriate self-treatment plan for the patient. Interaction among active valid users of the system can be done through online messaging and/or SMS. Additionally, different asthma related information, activities, services and organizations are likewise maintained in the system for information dissemination about asthma. There is also a report generation on asthma prevalence according to asthma type and other clinical parameters within Metro Manila. An automated asthma home monitoring is beneficial to over six million Filipino asthmatic children. With adequate guidance, self-management can provide

proper health care and a way to minimize medication cost but maximize health progress without the physical supervision of the primary physician.

Keywords: asthma, home monitoring, health information system, short messaging system

HSD No. 7

ONLINE HEARING LOSS SCREENING SYSTEM

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Hearing loss is a relevant problem in the Philippines as 20 % of Filipino children and more than half of the population have serious hearing problems. Due to the increasing noise pollution in our environment, early detection of hearing loss is recommended as the effects of hearing loss are often recognized in the advanced stage of hearing loss. The Online Hearing Loss Screening System (OHLSS) is created with the objective of allowing users to take tests for hearing loss detection as well as obtain information on loss of hearing. The screening tests used and included in the system are the hearing loss questionnaire, tone audiometry test and speech audiometry test. The system begins with instruction on the proper calibration of the sound-related hardware such as sound cards and earphone and the software configuration (volume control) An electronic questionnaire is to be answered followed by tone audiometry which test each ear for sensitivity to normal sound levels. The tone audiometry plays three tones at 20 db HL (for pre-school and school-age users) and 25 db HL (for adults) in 1000 Hz, 2000 Hz, and 4000 Hz and silent intervals for each ear. Then the screening application runs the speech audiometry which test the user's speech recognition. Speech audiometry randomly plays 20 sounds of words with noisy background and allows users to select from four possible choices the appropriate picture and/or word that matches what the user heard. For each screening test, results are shown to the user and advice is given. Additionally, OHLSS also provides information about hearing loss, classification, causes, cure as well as preventive measures. OHLSS can be utilized in areas where there are few experts or unavailable audiometric equipment.

Keywords: hearing loss, online screening system, audiometry, health information system

HSD No. 8

CHILD IMMUNIZATION MONITORING SYSTEM

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Childhood immunization is significant in preventing occurrence of several diseases. Failure to immunize a child on time can lead to new outbreaks of various diseases that are often deadly. Thus, the Department of Health implemented the Under Five Clinic and the Expanded Program on Immunization (EPI). The Under Five Clinic monitors immunization as well as growth patterns of children under five years of age while the Expanded Program on Immunization reduces infant mortality and morbidity through decreasing the prevalence of six immunizable diseases namely TB, diphtheria, pertussis, tetanus, polio and measles. At present there is no automated system that handles these records thus it is difficult to consolidate the results at the city, regional and much more on the national level which are necessary in order to come up with a more effective plan to reach out to families. As a response, a prototype system called "Child Immunization Monitoring System" was created. This is a web-based application that manages immunization records as well as the child's growth and weight and patterned after the Department of Health's Under Five Clinic and EPI. It has four major modules namely: a) vaccination coverage, b) vaccine inventory management, c) reminder and recall notification, and d) growth and weight. The vaccination coverage module can generate summary reports such as i) number of patients scheduled to have immunizations on a given month, ii) number of patients who showed up for follow-up on a given month, iii) number of patients who have not returned since their last follow-up date, iv) percentage of fully immunized child (FIC), etc.. The vaccine inventory management module can show the number of vaccines used in a specific clinic, city, or region over a given period. The reminder and recall notification module uses short messaging system (SMS) for parents with mobile phones to remind them of their child's upcoming vaccination. The growth and weight module enables health workers to update the child's age, height, and weight as well as view the growth chart. The usefulness of this system can be appreciated more especially when linked to a patient's medical record.

Keywords: child immunization, Expanded Program On Immunization, Under Five Clinic, monitoring system, health-care delivery system

HSD No. 9

**PREVALENCE OF *Staphylococcus aureus* NASAL COLONIZATION
AMONG GERIATRIC POPULATION OF ILIGAN CITY**

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Staphylococcus aureus is considered to be one of the major human pathogens causing a wide range of infections and diseases and its colonization is documented to be one of the significant risk factor for subsequent infection. Elderly adults, 60 years and above, are a high risk of nosocomial and community-acquired staphylococcal infections due to impaired host defenses. The study was undertaken to determine the carriage rates of staphylococcus among healthy geriatric individuals and to determine the possible predisposing factors of *S. aureus* colonization. Fifty healthy geriatric individuals were recruited for the study in December 2005 to January 2006. Nasal swabs were taken from each respondent and were directly inoculated onto mannitol salt agar (MSA) for the detection and isolation of staphylococcal strains. Eighty-six percent (43/50) of the study population yielded positive nasal swab cultures.

One hundred fifty-three presumptively identified *Staphylococcus* isolates were randomly picked with 74 (48%) *S. aureus* isolates (mannitol fermentor, catalase and coagulase positive) and 79 (52%) were coagulase-negative *Staphylococcus* (conS). Forty-four percent of the plates (19/43) exhibited growth of both *S. aureus* and conS, 33% (14/43) with *S. aureus* alone and 19% (10/43) exclusive for conS. Individuals with history of antibiotic use yielded the most number of *S. aureus* isolates (17/43) followed by those with current illness (15/43), smokers (14/43), users of nasal sprays (9/43), users of herbal supplements (6/43) and with skin lesions (1/43).

The significantly high percentage of staphylococcal carriage rate (86%) in the study population is beyond the commonly reported colonization rates of normal individuals which would range from 20–40% of the population. The aged respondents generally would have lowered immunity and thus may have contributed to the higher *S. aureus* nasal colonization which may facilitate subsequent infection.

Keywords: Geriatric population, *Staphylococcus aureus* carriage rates, coagulase-negative staphylococci (conS)

HSD No. 10

BEHAVIORAL TRAITS IN MONOZYGOTIC AND DIZYGOTIC TWINS

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It is argued that behavior is the most complex phenotype reflecting the whole functioning of the organism. It is very dynamic and changes in response to its environment. How can behavior be studied then? Are behaviors inbred, written indelibly in our genes as immutable imperatives? Or, is the environment more important in shaping our thoughts and actions? Twin studies can assess the extent of relatedness to which resemblance is due to shared genes and the extent to which is due to shared environments and have been traditionally used in the assessment of hereditary and environmental influences on behavioral development. In this study, we determined the prevalence of behavioral traits in twins and estimate twin similarity using concordance and discordance rates. The following traits were studied: handedness (combing, toothbrushing, folding of things, picking of things, handwriting, change of hand preference in doing heavy tasks), hair whorl (clockwise, counterclockwise), tongue abilities (rolling, curling, rolling/curling), hand clasping (right over left, left over right), arm folding (right over left, left over right), stuttering (yes, no). One hundred eighty two (182) twin pairs, 149 monozygotic and 33 dizygotic were the subjects of this study. Left hand clasping, arm folding and toothbrushing were found to occur more frequently in monozygotic twins. On the other hand, holding of things by the left hand was found prevalent in dizygotic twin pairs. Non-stuttering was frequently observed in monozygotic twins. Chi-squared test showed no sex-difference in prevalence of behavioral traits. Twin similarity for ordinal data calculated as concordance rates (pairwise and probandwise) according to sex and zygosity revealed high probandwise and pairwise concordance rates in monozygotic twins. Tongue ability (curling), combing (left) and stuttering (yes) and left hand clasping were found to have high probandwise and pairwise concordance rates in dizygotic twin pairs. For monozygotics, pairwise and probandwise concordance rates were found in high frequencies for hairwhorl (counterclockwise), toothbrushing (left), holding of things (left), handwriting (left), preferential hand use when doing heavy tasks (left). Arm folding (left) was found to have equal concordance rates in both monozygotics and dizygotic twin pairs. We are still in the process of increasing the number of twin pairs being studied especially the dizygotics to be able to present phenotypic correlations of behavioral traits and

show the source of the influences in behavioral traits through structural equation modeling to accommodate the analysis of gender differences in heritability estimates.

Keywords: behavior, heritability, monozygotic twins, dizygotic twins

HSD No. 11

**AN INTEGRATED SYSTEM FOR DNA ANALYSIS OF
SEXUAL ASSAULT EVIDENCE**

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The strength of DNA evidence depends on the effectiveness and reliability of the procedures used to collect, transport, store and analyze biological samples from which DNA evidence is generated. A system ensuring the proper documentation and preservation of evidence during collection and transport to the forensic laboratory and the subsequent storage and DNA analysis of the evidence at the laboratory would facilitate the resolution of sexual assault cases.

An evidence collection kit designed and assembled by our laboratory for sexual assault cases was used by Child Protection Units (CPUs) across the country (Baguio, Cebu, Davao and Manila) to collect, document and preserve biological evidence. Transport of evidence from the CPUs to our laboratory was handled by Air21, a local courier service provider. Upon receipt at our laboratory, evidence packages and appropriate documentation were inspected; the evidentiary materials inventoried and placed under appropriate storage conditions. For DNA analysis, a standard DNA extraction protocol (Phenol-chloroform-isoamyl alcohol) and a commercial DNA extraction kit (Qiagen™, QIAamp® DNA Micro Kit) were used and compared. DNA extracted from sexual assault evidence was analyzed using Y-chromosome and autosomal short tandem repeat (STR) typing.

We report here our efforts to validate (1) sexual assault evidence collection using our evidence collection kit; (2) transport of evidence via a local courier system (3) A more efficient and cost effective protocol for DNA extraction from sexual assault evidence; (4) STR (autosomal and Y-chromosome) screening of biological

evidence and (5) the overall system of appropriate procedures for handling of sexual assault evidence from collection to DNA analysis.

Keywords: sexual assault, DNA analysis, STRs, autosomal, Y-chromosome

HSD No. 12

**CYTOGENETIC AND MOLECULAR DIAGNOSIS AND MONITORING OF
RESIDUAL DISEASE IN FILIPINO PATIENTS
WITH CHRONIC MYELOGENOUS LEUKEMIA**

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Methods for monitoring response to treatment in chronic myelogenous leukemia (CML) have changed considerably in recent years. In addition to routine analysis of Ph chromosome in G-banded metaphase chromosomes, molecular techniques like reverse transcriptase polymerase chain reaction (RT-PCR) and fluorescence in situ hybridization (FISH) are currently being used. These techniques have proved extremely available not only for diagnosis of CML but also for assessing and monitoring minimal residual in patients who have achieved Ph negativity after chemotherapy.

RT-PCR is considered to be the most sensitive method to date in detecting low leukemic burden. The technique can be carried out using peripheral blood (instead of bone marrow aspirate) and does not require the presence of dividing cells. It has the unique ability of determining specifically the type of fusion gene encoding either p190 or p210.

Ninety-five samples were submitted both for routine cytogenetic analysis and RT-PCR (nested PCR). Of these, 46 (48%) were newly diagnosed CML cases while 49 (51%) were from patients undergoing chemotherapy, many of whom are treated with ABL tyrosine kinase inhibitor imatinib mesylate or GLIVEC. In 15 (15.78%) of these patients, cultures failed to produce mitotic cells so cytogenetic analysis was not done, but RT-PCR detected the presence of the BCR-ABL fusion gene. In fourteen samples (14.73%), cytogenetic study showed normal karyotype

but RT-PCR revealed these were BCR-ABL-positive. The use of these molecular methods provided vital information that helped clinicians plan the therapeutic management of these patients, especially in recognizing early signs of relapse. The awareness of clinicians of the availability of these tests in the country will have a great impact on healthcare delivery for leukemia patients.

Keywords: Chronic myelogenous leukemia, residual disease, imatinib mesylate RT-PCR, FISH

HSD No. 13

ONLINE B-CELLEPITOPE PREDICTION APPLICATION

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Epitopes are the regions of a peptide antigen which interact with antibodies. Locating these epitopes is of particular interest to areas of vaccine research particularly designing subunit or recombinant vaccines that contain only the components necessary to induce production of memory cell. The Online B-Cell Epitope Prediction Application aims to predict the location of epitopes on an antigen by constructing the sequence scaling profile of the antigen's linear amino acid sequence. It provides a module that uses multiple scales to produce a composite profile that allow user to enter a linear sequence of amino acids from a protein antigen, select propensity scales to compute propensity scores for the sequence using Jameson-Wolf model, outputs the profiles representing the composite score in graphical format. In addition, there is a tutorial module which provides static and animated lectures to aid the users in understanding the concepts behind the construction of scaling profiles. An automatically generated test is likewise provided to the users. The application provides an efficient means of comparing which combination of sequence scales predict with high degrees of correctness the set of possible antigenic sites for a given antigen and therefore predict epitope portions. Hence, it can be used to identify potential vaccine candidates for human pathogens such as viruses. It can also be used to in testing genetically modified food for possible allergens. Lastly, it can be also be used as a teaching supplement in B-cell epitope prediction in molecular biology classes.

Keywords: immunology, antigen, epitope prediction, propensity scale, Jameson-Wolf model

HSD No. 14

**CHROMagar *Candida* AS PRESUMPTIVE IDENTIFICATION MEDIUM
FOR *Candida albicans***

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CHROMagar *Candida* (CA) as a chromogenic differential medium has been reported to have 100 percent sensitivity and specificity in the identification of *Candida albicans*. This study was performed to presumptively identify *C. albicans* and non-*C. albicans* from 34 self-collected vaginal swabs of healthy women of Iligan City and to determine if there is any significant difference in the carriage rates between contraceptive users and non-contraceptive users. Fifty-nine percent (20/34) of the vaginal swab cultures yielded positive yeast-like growth on the primary isolation medium Sabouraud Dextrose Agar (SDA). Of the 20 plates with yeast-like growth, thirteen vaginal swab cultures came from individuals currently using contraceptive methods.

Generally, three isolates per colony type per plate were randomly picked. A total of seventy-nine isolates were collected and subcultured twice onto SDA to ensure purity. All 79 isolates grew on CA and the results were read by two different people according to the color, morphology of colonies and the existence of halo around them after 24 and 48 hours. Only thirteen percent of the total number of isolates (10/79) exhibited green colonies on CA and were presumptively identified as *C. albicans*. The remaining 69 non-*C. albicans* isolates had varying colony colors: cream (42%), violet (31%) and pink (27%).

Keywords: *Candida albicans*, CHROMagar *Candida* (CA), vaginal swab cultures, Sabouraud Dextrose Agar (SDA)

HSD No. 15

MODULATION OF MMP EXPRESSION OF NORMAL HUMAN DERMAL FIBROBLAST VIA PARACRINE FACTOR(S) GENERATED BY SQUAMOUS CELL CARCINOMA IS MEDIATED BY ERK1/2 AND p38

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Enhanced secretion of several types of matrix metalloproteinases (MMPs) is a characteristic of metastasis. Since a coordinated interaction of epithelial cells with stromal cells is a prerequisite for tumor invasion and metastasis, this study was undertaken in order to determine if paracrine factor(s) secreted by cancer cells modulate(s) the expression of MMPs in stromal cells and to study the molecular mechanism of the modulation of SCL-1 induced MMP expression in fibroblasts. Incubation of confluent monolayer of normal human dermal fibroblasts (NHDF) with supernatant taken from the tumor cell squamous cell carcinoma cell line (SCL-1) resulted in 5 and 60-fold increase of MMP-1 and MMP-10 expression, respectively compared to untreated NHDF as measured by RT-PCR. Time course analysis of MMP expressions in SCL-1 supernatant-treated NHDF revealed that the upregulation starts 4 h after treatment. ELISA assay revealed that MMP protein secretion is also increased when NHDF was treated with SCL-1 supernatant. Furthermore, treatment of NHDF with SCL-1 supernatant resulted in the activation of the 3 MAPK pathways (ERK-1/2, p38 and JNK). Incubating NHDF with inhibitors against MEK1/2 (U 0126) or p38 (SB 202190) before and during incubation with SCL-1 supernatant resulted in the inhibition of enhanced MMP expression of NHDF as induced by SCL-1 supernatant. Taken together, this study indicates that the activation of the ERK1/2 and p38 pathways plays a crucial role in the regulation of MMP activity of NHDF induced by the paracrine factors secreted by SCL-1 cells.

Keywords: MMPs, NHDF, SCL-1, ERK1/2, p38, metalloproteinases, metastasis, paracrine

HSD No. 16

GENETIC POLYMORPHISM OF *gstm1* AND *nqo1* IN FILIPINO PEDIATRIC ACUTE LYMPHOBLASTIC LEUKEMIA (ALL)

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Leukemia is the leading type of cancer among Filipino children and being a complex disease is associated with hereditary susceptibility to a number of carcinogenic and biological agents. Gene polymorphisms coding for carcinogenic detoxifying enzymes such as Glutathione S-transferases (GSTT1 and GSTM1) and NAD(P)H:Quinone Oxidoreductase1 (NQO1) are reported to have an association with the risk of developing various cancer types. Frequency distribution of these biomarkers varies among Asians, Caucasians and other ethnic groups, and has not been identified among blood related cancer types such as Leukemia among Filipino cases.

Screening of GSTT1, GSTM1 and NQO1 Genotypes was conducted using Multiplex Polymerase Chain Reaction (PCR) from 180 DNA samples (60 randomly selected Acute Lymphoblastic Leukemia patients, 60 normal individuals, and 60 cases with other hematological diseases) isolated from peripheral blood of pediatric individuals (4 to 18 yrs old) diagnosed at the University of Santo Tomas Hospital and The Children's Medical Center, Banawe Manila. Optimization of PCR conditions using varying Magnesium chloride concentrations, annealing temperatures and DNA concentration was conducted. Pertinent clinical information was also gathered and analyzed.

Results showed that Multiplex amplification of the "positive" and "null" genotypes for GSTT1 (459bp) and GSTM1(219 bp) using Albumin as internal control (350 bp) was optimized at 3.0 mM Magnesium chloride concentration, 66°C annealing temperature and 100 ng/ul DNA concentration. NQO1 detection of the C (161 bp) and T (283 bp) alleles for the C/C, C/T and T/T genotypes is recommended at 3.5 mM Magnesium chloride concentration, 60°C annealing temperature and 100 ng/ul DNA concentration.

Based on the preliminary screening conducted among 180 Filipino Pediatrics, it was observed that most individuals carry the GSTT1 "positive" allele (65%) with almost equal distribution between leukemia, normal and other cancer individuals (65%,67%,50% respectively). Most pediatrics however possess the "null" GSTM1

genotype (60%) with 43 out of 60 leukemia patients (72%) lacking the allele, 52% of normal individuals and 57% with other hematological disease. For the NQO1 genotypes, most normal and those individuals with hematological diseases are heterozygotes (C/T) with 75% and 98% respectively, and interestingly, most Leukemia patients possess the wild type (C/C) genotype (60%).

These results conform with reported frequencies from different race and confirms the lack of the GSTTM1 allele in most Asians including Filipinos. Comparison of the Leukemia genotypes with normal individuals and with other hematological can assist clinicians in providing insights on leukemia susceptibility, possible measures of avoidance or prevention and additional information for clinical management.

Keywords: Gene Polymorphisms, Multiplex PCR, GSTT1, GSTM1, NQO1

HSD No. 17

PHYLOGENETIC ANALYSIS OF HEMOLYSIN GENE FAMILIES IN *Vibrio* SPECIES

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Bacterial hemolysins are considered important virulence factors of pathogenic *Vibrio* species, causing erythrocyte membrane lysis in the host. *Vibrio* species express a range of hemolysins that can be grouped into four representative families namely: TDH (thermostable direct hemolysin) family, HlyA (E1 Tor hemolysin) family, the TLH (thermolabile hemolysin) family and the *d*-VPH (thermostable hemolysin) family. The genes encoding hemolysins have been isolated, cloned, sequenced and characterized in several pathogenic and non-pathogenic *Vibrio* species. In this study, the phylogenetic relationship of hemolysins among *Vibrio* species is determined first by multiple sequence alignment of available hemolysin nucleotide and amino acid sequences using CLUSTALW/MULTALIN 5.4.1 and phylogenetic tree construction using MEGA software. Results show separate clusters for each of the hemolysin gene families, with the hemolysin gene of *Vibrio harveyi* and the recently isolated and sequenced hemolysin gene of *Vibrio campbellii* forming a close group with thermolabile hemolysins. The thermostable direct hemolysin and HlyA families each form a separate cluster. The phylogenetic analysis was extended to include the related proteins phospholipases and lecithinases, and results reveal close relatedness of phospholipases to the thermolabile hemolysins of

Vibrio while the lecithinases group was closer to the thermostable direct hemolysins.

Keywords: *Vibrio*, hemolysin genes, phylogenetic analysis

HSD No. 18

SEQUENCE ANALYSIS OF 16S rRNA GENE IDENTIFIES UNKNOWN MYCOBACTERIAL PATHOGENS OF THE EYE AFTER CATARACT SURGERY

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Gene sequence analysis of 16S rRNA provides more rapid, unambiguous identification of difficult bacterial isolates compared to conventional methods. Accurate identification can translate to improved clinical outcomes through the application of appropriate treatment. This study reports on the use of 16S rRNA gene analysis to identify unknown mycobacteria isolated from eyes which have undergone cataract removal. Lowenstein-Jensen agar cultures of mycobacteria from infected corneal tissues and lens implant were studied. Biochemical tests and species identification by 16S rRNA gene sequence analysis were done. The sequences were compared to those in the NCBI GenBank database and Ribosomal Differentiation of Medical Micro-organisms Database (RIDOM).

The partial 16S rRNA gene sequences of 3 isolates were found to have 99%, 90%, and 95% homologies to that of *Mycobacterium massiliense*, sp. nov. based on a comparison with sequences in NCBI GenBank. Comparison of the same with those in the RIDOM database showed 91.92% identity with both *M. abscessus* and *M. chelonae*. Four biochemical tests capable of differentiating *M. massiliense* from *M. abscessus* and *M. chelonae*, tryptophan desaminase, b-glucuronidase, N-acetyl-b-glucosaminidase, and b-galactosidase, were performed on two of the isolates. Both were positive for tryptophan desaminase, and negative for the other three enzymes. This profile differed in one test from that reported for *M. abscessus* and *M. chelonae*, and 2 tests from that of *M. massiliense*. In this study, 16S rRNA gene analysis and biochemical profiling showed that the three isolates are closely related to the *M. abscessus*-*M. chelonae* group.

Keywords: 16S rRNA gene, nontuberculous mycobacteria, eye infection

HSD No. 19

CARRAGEENAN-COCOA BUTTER BASED SUPPOSITORIES FOR FEVER

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A carrageenan-cocoa butter based suppository for fever was produced. Acetaminophen was used as the active ingredient. This was done by dissolving the carrageenan with water then mixed thoroughly to obtain a thick homogenous mixture. Afterward the mixture was added to melted cocoa butter previously mixed with stearic acid and preservatives followed by constant stirring while slowly adding the acetaminophen. After obtaining a dough-like consistency, the mixture was then poured into the mold and allowed to congeal at 4 °C. Then removed from the mold and packed. The suppositories are prepared in 250 mg dose for children and 500 mg dose for adult. They melt at body temperature (37 °C) and liquefy within 3–7 minutes. Bioavailability assay of the carrageenan-cocoa butter based suppositories in rabbits showed that acetaminophen was absorbed from the suppository and becomes available at the site of drug action based on the presence of acetaminophen at various concentration levels in the blood. The blend of carrageenan-cocoa butter is a good suppository base for acetaminophen. Carrageenan increases the release and absorption rate of acetaminophen from the suppository. It is a good drug-carrier for acetaminophen in suppository form via rectal administration.

The use of carrageenan in the production of suppositories is an innovative technology that will expand the application of carrageenan in the areas of pharmaceuticals and medicine. Thus, it will indirectly help boost the Philippine carrageenan industry in the world market with these other fields of development.

Keywords: Carrageenan, Suppository, Acetaminophen, Cocoa-butter

HSD No. 20

INHIBITORY EFFECTS OF ANTIBIOTIC-LADEN CEMENT STICKS ON MICROBIAL PATHOGENS: POTENTIAL TREATMENT OF POST-SURGICAL INFECTION

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Infection, one of the most feared complications in prosthetic joint surgery, is of great concern because it may result in total loss of joint function. The use of antibiotic-laden cement sticks is a new modality to manage such bone infections. These are implanted into areas where periprosthetic infections persist. This study aims to determine the inhibitory activity of antibiotics released from the bone cement sticks on three different pathogens - *Staphylococcus epidermidis*, *S. aureus* and *Enterococcus faecalis*.

CM3 cements, pre-loaded with Gentamicin (*Gen*), Vancomycin (*Van*) and a fusion of Vancomycin and Fucidin (*Van-Fuc*) and bone cement without antibiotic, were tested. They were immersed in 5 ml 0.9% normal saline solution (NSS) at room temperature. The eluate was collected once a day for a week, after which fresh NSS was added. Thereafter, collection was done every week for a period of one month. Agar-diffusion technique was used to determine the inhibitory effects of the eluates on the 3 test bacteria. The biggest zones of inhibition (25.25, 20.33 and 15.50 mm for *Van-Fuc*, *Van*, and *Gen* respectively) were observed with *S. epidermidis* using the 24-hour eluates. The zone diameter decreased for the rest of the week, but started to increase up to the 2nd month. The decrease in the size of the inhibition zones was 55% for *Gen*, 38% for *Van*, and 23% for *Van-Fuc* at the end of the 1-week period. In terms of effectivity, *Van* and *Van-Fuc* inhibited all the microorganisms tested, while *Gen* inhibited only *S. epidermidis*.

In this study, we found that regardless of the kind of antibiotic loaded in the cement, the highest elution occurred during the first 24 hours. The agar plate diffusion method is a useful and reproducible technique for *in vitro* measurements of inhibitory activity of the antibiotics released from the bone cement sticks.

Keywords: Antibiotic-laden cement sticks, elution, diameter of inhibition zone, Vancomycin, Gentamicin, Vancomycin-Fucidin, prosthetic joint surgery, post-surgery infection

HSD No. 21

**SIMPLE TESTS PREDICTED MULTIPLE DRUG RESISTANT
STAPHYLOCOCCUS AUREUS IN A TERTIARY HOSPITAL, 2001-2005**

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Staphylococcus aureus (Sa) causes boils, toxic shock syndrome, and diseases of the lung, heart, and bone. Penicillins easily treated these infections. In 1950, Sa began producing beta-lactamases that destroyed the beta-lactam ring and rendered these agents inactive. In 1960, Sa became resistant to the newer beta-lactams, BLs, (methicillin, oxacillin) and cephalosporins. This new strain, known as methicillin-resistant Sa (MRSA), harbors the *mecA* gene, is resistant to ALL BLs and BL/BL-inhibitor combinations, and is now causing immense problems in treatment leading to morbidity and mortality. Our study monitored multiple-drug resistant Sa in a tertiary hospital from 2001-2005 by using oxacillin disk as preliminary indicator, and confirmed methicillin resistance with cefoxitin disk. *MecA* is expressed at high levels in the presence of cefoxitin. Fifty-three MRSAs were identified out of 297 (17.8%) Sa isolated from clinical specimens in 2001-2005: 22.5% (13/40), 15.5% (11/71), 21.4% (15/70), 11.8% (10/85), and 12.9% (4/31), respectively. The antibiogram profile of the MRSAs showed resistance to ALL BLs and BL/BL-inhibitor combinations. Although vancomycin is the agent of choice for MRSAs, results indicate this pathogen is still susceptible to the following: sulfamethoxazole/trimethoprim (98%), gentamicin (96%), tetracycline (94%), and rifampicin (96%). An important observation in this study is the emergence of another threat: macrolide-lincosamide-streptogramin (MLS) resistance which was noted in 2003 (1.4%, 1/70) and 2004 (1.1%, 1/85). MLS-resistance is suspected in erythromycin-resistant and clindamycin-susceptible isolates. The D test was performed to assess resistance to clindamycin. Positive D test results indicate that the clinical isolates in these cases should be reported as resistant to clindamycin. Without supplementary tests the patient runs the risk of treatment failures. Results further suggest the presence of two resistance mechanisms in these isolates: *mecA*-encoded methicillin-resistance and *erm*-encoded MLS-resistance. We, therefore, conclude that for every Sa strain three simple tests be done: the oxacillin, cefoxitin, and D tests.

Keywords: *Staphylococcus aureus*, MRSA, MLS resistance, D test

HSD No. 22

ANALYSIS OF ETHANOL IN BLOOD USING HEADSPACE GAS CHROMATOGRAPHY WITH FLAME IONIZATION DETECTOR

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Blood alcohol concentration is an important measure of alcohol consumption. The alcohol level in the blood at a certain time may affect a court decision resolving a criminal act such as murder, rape and other reckless acts related to high levels of alcohol in the blood. Currently, there is no known forensic lab in the Philippines that tests alcohol in blood or urine.

Gas chromatography with a flame ionization detector, together with headspace analysis was utilized for the determination of ethanol. One mL of the headspace gas in vials containing varying concentrations of ethanol, which were heated at 70 to 80°C for 5 minutes, was injected into the GC column. A DB-WAX column with an isothermal temperature of 120°C was used. In this method, ethanol had a retention time of approximately 2 minutes. The coefficient of variation for the retention times ($n=5$) was 13.6% while that of peak areas was 6.9% ethanol gave linear response with the concentration range of 1 to 5 g/L both in aqueous solution and in spiked blood sample. The limit detection was 0.008% ethanol (w/v).

Healthy volunteers were made to consume alcohol with informed consent and their blood samples were analyzed for ethanol using this chromatographic method. The chromatogram of blood sample from a non-drinker showed the absence of the ethanol peak. The calibration plot of ethanol spiked in blood was used to determine the ethanol concentrations in the blood samples.

This method can be used for the analysis of ethanol in blood for forensic analysis, and more importantly, the diagnosis of patients suffering from alcoholism. It is recommended for use in routine tests for employment screening and driving license application.

Keywords: ethanol, blood, headspace gas chromatography, flame ionization detector, alcoholism

HSD No. 23

**RECOMBINANT BLO T 11 PEPTIDE FOR THE DIAGNOSIS OF
HOUSE DUST MITE ALLERGY AMONG FILIPINO ALLERGIC PATIENTS**

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The paramyosin-homolog allergen Blo t 11 from the house dust mite (HDM) *Blomia tropicalis* (Bt) is an important allergen causing sensitization of more than 50% of allergic patients in tropical countries. Recombinant peptide coding for the immunodominant epitope of Blo t 11 is an invaluable reagent for HDM allergy diagnosis and immunotherapy. The 666 bp immunodominant fragment of Blo t 11 was amplified by PCR, cloned into pGEX-4T-1 vector, expressed as a GST-fusion peptide in *Escherichia coli*, purified by affinity chromatography using glutathione agarose column, and was used in an IgE ELISA using a panel of sera from 100 Filipino allergic patients. The 222 aa immunodominant peptide fD was highly expressed in soluble form with an average yield of 5.7 mg recombinant peptide per liter of *E. coli* culture. Recombinant fD migrated to ~50 kD in a 12% Tris-Glycine SDS-PAGE gel in accordance to its predicted molecular weight (24 kD + 26 kD GST). The allergen reacted positively to 87% of Filipino allergic patients' sera tested. An inhibition assay indicated that fD is responsible for more than 50% IgE reactivity observed in Bt extract. The results presented in this study showed the utilization of recombinant Blo t 11 peptide fD as diagnostic reagent for HDM allergy. The inclusion of this peptide in the panel of allergens used in the diagnosis and immunotherapy of HDM allergy is highly recommended.

Keywords: Allergy, recombinant peptide, *Blomia tropicalis*, immunoglobulin E

HSD No. 24

**THE ANTIDIABETIC ACTIVITY OF *Tinospora rumphii boerl*
(MAKABUHAI) LEAVES**

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Leaves of makabuhai (1500 g) were soaked in 3 liters of ethylacetate for five days and the crude extract was obtained. The crude extract exhibited a bluish dark green color and was very sticky. The filtrate was concentrated using a rotary evaporator and purified by column chromatography. The structure of the purified extracts were elucidated using infrared spectra which revealed the presence of phenolic OH, C-H and ester functional groups, UV-Vis analysis indicated the possible presence of polyenes and multiple bonds with a maximum absorbance of λ 434 cm^{-1} . The presence of the following compounds were identified using gas chromatography-mass spectrometry: 1,2-benzenedicarboxylic acid, diisooctyl ester; 1-oxaspiral (2,5) octane, 5,5-dimethyl-4-(3-methyl-1,3-butadienyl); cedran-diol, 8S,14; spiculesporic acid; retinoic acid, methyl ester; 2-(4-methyl-6(2,6,6-trimethyl.cyclohex-1-en-1-enyl)hexa-1,3,5-trenyl)cyclohex-1-en-1-carboxaldehyde; 4,8,13-cyclotetradecatriene-1,3-diol, 1,5,9-trimethyl 12-(1-methyl ethyl).

Albino Swiss Webster Mice of 4–5 weeks-old, male were used as the test specimen for the bioassay using Tail Venipuncture Method. Diabetes was induced in the mice which were divided into four groups. The purified and crude extract of makabuhai showed 19.65% and 19.52% decrease in blood glucose level and was close to the standard medicine decrease of 20.41%. The % decrease is relative to the hyperglycemic blood glucose level. Based on the results obtained, the leaves of makabuhai exhibits hypoglycemic properties.

Keywords: antidiabetic activity, hyperglycemia, bioassay, infrared spectra, ultra-violet spectra, gas chromatography, mass spectra.

HSD No. 25

ANTITUMOR POTENTIAL OF THE LEAF EXTRACT OF SOME HEALTH FOODS

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Cancer is one of the leading causes of death all over the world. In this study, histopathological techniques were used to determine the antitumor potential of lettuce, coriander, leek and strawberry in the heart and aorta of Swiss albino mice. Dimethylbenzanthracene was the tumor initiation agent while croton oil was the promoter. The leaf extract was given before initiation or after tumor promotion for 24 weeks. The heart and aorta were dissected out and processed after the 24th week. *Lactuca sativa* or lettuce showed potential as antitumor initiator while *Coriandrum sativum* or coriander had antitumor promotion potential.

Keywords: Antitumor potential, leaf extract, coriander, lettuce, leek, strawberry

HSD No. 26

BIOACTIVE COMPOUND FROM ACTINOMYCETE FOR HEALTH AND AGRICULTURE APPLICATIONS

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Philippine Actinomycetes are untapped microbial resources which can be exploited for the discovery of new bioactive compounds against existing antibiotic resistant organisms and pests in agricultural crops.

The worldwide occurrence of Methicillin Resistant *Staphylococcus aureus* (MRSA) and *Candida albicans* are the most common causes of fatal infections and diseases in hospitals. In 2002, emergence of Vancomycin-resistant *S. aureus* and enterococci is raising serious public health concerns. *Candida albicans* is an equally significant organism causing Candidiasis in women. With the threat of antibiotic

resistant organisms, it is imperative to continue search for organisms producing novel antibiotics.

Out of 388 Actinomycetes assayed, A5 from garbage soil in Pakil, Laguna showed antimicrobial activity against 9 clinical strains of MRSA (9.1-13.3mm) and 2 strains of *C. albicans*, Ca1 (13.15mm) and Ca4 (11.95mm). Minimum inhibitory concentration (MIC) (Marfori et. al., 2002) of ethyl acetate extract using *C. albicans* as test organism showed the same MIC as the positive control (Nystatin) 7.8 ppm. Bioautography (Marfori, 2002) produced 1 active spot against *C. albicans*. The same extract showed 4 active spots against MRSA. Fractionation of the active compound was done using solvents of increasing polarity.

Ethyl acetate extract of A5 was highly toxic to larvae of diamondback moth, *Plutella xylostella* and Asian corn borer, *Ostrinia furnacalis*, major insect pests of crucifers and corn, respectively.

Actinomycete isolate A5 is a potential source of active compound against antibiotic resistant organisms and pests in agricultural crops.

Keywords: Actinomycete, Methicillin resistant *Staphylococcus aureus*, MRSA, *Candida albicans*, bioautography

SOCIAL SCIENCES

SSD No. 1

ATTENTION DEFICIT HYPERACTIVITY DISORDER (ADHD) AMONG TEENAGERS AND IN SCHOOL CHILDREN AGES 3-8 IN ILIGAN CITY

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Attention Deficit Hyperactivity Disorder (ADHD) is a developmental disability that usually affects children and is usually characterized by behavioral and learning disorders. Some of commonly cited characteristics in children with ADHD are hyperactivity, distractibility and impulsivity. Children with ADHD find it difficult to perform a task assigned to them and focus on some of the important aspects of conversations. We used the SNAP-IV Teacher and Parent Rating Scale to get the information needed from the child in selected schools from Iligan City. In this