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Posters

Robert Ndou, J Forensic Res 2016, 7:5(Suppl)
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Can upper limb osteometric parameters distinguish populations?

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South Africa is a country of diverse populations consisting of the indigenous Blacks, Whites (individuals of European descent) and mixed ethnic groups (descendants of Whites, Blacks and Khoisan people), among others. These groups have different physical features. As such, we queried whether upper limbs bones would have different dimensions in these 3 populations. A total of 1175 paired dry humeri and ulnae from 596 skeletonized individuals were analyzed. Limbs of both sides were included for 579 individuals, whereas 17 individuals had only a single side present. These bones are from three South African groups; 126 Whites, 232 Mixed ethnicity and 238 Blacks housed at the University of the Witwatersrand, Raymond A Dart Human Skeletal Collection. The following measurements were taken from the humerus: head circumference, shaft circumference at the 25th, 50th and 75th percentile marks of the humerus length, epicondylar breadth and humerus length. From the ulnar, the olecranon process length, coronoid process length, trochlear notch depth, olecranon-coronoid distance and ulnar length. A discriminant function analysis was conducted to determine the upper limb skeletal parameters that contribute to population variation. The structure matrix showed that both the humeral and ulna variables made major contributions to population variability. However, the olecranon fossa depth and the humeral head circumference contributed the most to population variability. The model correctly classified 78.9% of the individuals as White, 68% as Mixed and 79% as Black. Therefore, this study forms a basis for future research that may have forensic anthropological applications in these population groupings.

Biography

Robert Ndou obtained his PhD from the University of the Witwatersrand where he is a Lecturer. His research focuses on the skeletal system and makes use of the Raymond A Dart Skeletal Collection housed at the University of the Witwatersrand. One of his research interest areas is human variation with respect to the skeletal system and its forensic anthropological applications.

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Jin Myung Lee, J Forensic Res 2016, 7:5(Suppl)
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Validation study of GlobalFiler™ PCR amplification kit and PowerPlex® fusion system for 24 STR loci and Y indel

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Short Tandem Repeats (STRs) are the most powerful tools for human identification in the field of forensic genetics. Recently, the multiplex GlobalFiler™ PCR Amplification kit (Applied Biosystems) and PowerPlex® Fusion system (Promega) were released with 24 loci, including the CODIS core, the European Standard Set and additional male-specific markers. In Korea, a DNA database has been constructed based on 13 STR CODIS core loci, and we are aiming to expand the number of testable STR loci in accordance with the expanded CODIS core loci. Therefore, in this study, we estimated the performance of the GlobalFiler™ PCR Amplification kit and PowerPlex® Fusion system for application of the expanded STR loci for DNA database generation and forensic casework analysis. For the validation, we performed five experiments, including sensitivity, stochastic, scale-down, inhibitor, and mixture studies, and compared the results of both multiplex kits. Five genotyping discrepancies between the GlobalFiler™ PCR Amplification kit and PowerPlex® Fusion system were observed due to allelic drop-out (null alleles) or microvariants. With the expanded markers, both new kits were shown to provide robust genetic information and are suitable tools for DNA database and forensic analyses, such as human identity and parentage testing.

Biography

Jin Myung Lee has completed her Master's degree from The Catholic University of Korea. She is the researcher of National Forensic Service at Forensic DNA Division. She has published more than 10 papers in reputed journals.

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Notes:

Sathisha Kamanna et al., J Forensic Res 2016, 7:5(Suppl)
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Mass spectrometry-based forensic "Omics" in direct identification of body fluid protein markers

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Body fluids such as blood, seminal fluid, urine or saliva are very important in the investigation of crimes against the person such as murder and rape. Whereas DNA profiling is extremely reliable in establishing from whom the body fluid originated, tests to positively identify the type of fluid involved (e.g., whether it is semen or saliva or a mixture of them) are much less refined and can be ambiguous. Our recently submitted article describes a streamlined and simplified direct approach for the identification of body fluids using matrix-assisted laser desorption/ionization time-of-flight mass spectrometry (MALDI-ToF-MS) that avoids pre-fractionation or isolation of proteins. Microliter quantities (or less) of neat fluids or their extracts or deposits of them *in situ* on tufts of fibers plucked from evidence (such as garments) can be analysed directly and quickly. Here we describe extensions of our direct approach in regards to the examination of other fluids, both human and non-human, and explore its combination with analysis of miRNA.

Biography

Sathisha Kamanna is pursuing 3rd year PhD at Flinders University, South Australia. His PhD project is "Mass Spectrometry-based proteomics applications in forensic body fluids analysis". He has 7 years work experience in biological mass spectrometry and is involved in the forensic analysis of body fluids and identification of protein/miRNA biomarkers using mass spectrometry based analytical techniques. He has 8 international publications (author/co-author) in reputed journals.

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Michael Radford et al., J Forensic Res 2016, 7:5(Suppl)
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Visualization of latent fingerprints on used condoms: Powdering method perspectives

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Despite emerging DNA techniques, fingerprint evidence remains to be valuable in criminal investigations. Many fingerprinting techniques have been developed over the years; however, previous forensic work has limited research studies geared at the examination of fingerprint visualizing methods for the forensic analysis of condoms. Using common fingerprint powdering techniques, we are attempting to determine the optimal method of visualizing fingerprints on this specific substrate of vital importance in sexual assault crimes. All of the methods consist of prolonged cyanoacrylate exposure followed by application of black fingerprint powder, bi-chromatic powder, and phosphorescent powder using the fiberglass brush. Another method consists of cyanoacrylate exposure followed by application of black magnetic powder using the magnetic wand. Novel approaches being presented in this study is the handling of the 'used' condoms prior to treatment. The samples being analyzed are placed over large plastic tubes after cyanoacrylate treatment prior to powdering application. This handling procedure has proven to be instrumental in attaining quality results. Furthermore, the analytical methodology also evaluated four different time variables after fingerprint deposition to assess the effect of fingerprint aging with respect to the tested powdering techniques. The analytical validation of various fingerprint powdering techniques for condom substrate samples can improve and further validate the use of this trace evidence and help establish the availability of fingerprint details that may lead to increased rates of prosecution within the criminal justice system as it relates to sexual assault crimes.

Biography

Michael Radford is a graduate student at Texas Tech University Institute for Forensic Science. He has a BS degree in Criminal Justice from University of Maryland University College. He served on active duty in the United States Marring Corps from 2005 to 2009 and is currently employed as a detective at the Lubbock Police Department.

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Notes:

Dorra Amira et al., J Forensic Res 2016, 7:5(Suppl)
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Paraphenylene diamine poisoning in Tunisia: A case report

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Background: In Tunisia, women use Para-Phenylenediamine (PPD) as an additive to henna in order to intensify the black temporary tattoos unaware of its deleterious effect. In this work we present a case report of poisoning by the PPD in order to highlight its noxious effects and discuss the complications resulting from PPD poisoning.

Description case: A young women was admitted to the emergency services. The patient was suffering from vomiting, muscle pain, motor deficit in the lower limbs and Paresthesia. The medical interrogatory confirmed the ingestion of unknown substance.

Material & Methods: The toxicological investigation was conducted on fresh urine sample and on the ingested product. A preliminary screening was performed on both matrices by Thin Layer Chromatography (TLC). The presence of PPD was further confirmed by (GC/MS). Biochemical analysis was performed by immunoassay (COBAS INTEGRA 400 plus®).

Results: The screening by TLC and GC/MS confirmed the presence of PPD in the ingested product. Besides, its metabolite N-N'-diacetyl-PPD was also identified in urine sample collected from the first dialysis performed 48 hours after ingestion of the toxic product. The urine samples collected 72 and 96 hours were negative. The biochemical analysis showed rhabdomyolysis reflected by an increasing of CPK and LDH levels (> 200,000 IU / L, 13000 IU / L) 48 H after ingestion. Abnormal liver function and kidney disease have been reported.

Conclusion: Rhabdomyolysis with respiratory, renal and heart disease are considered as the main signs of PPD poisoning. The therapy requires adequate medical care assistance

Biography

Dorra Amira is a Professor of Toxicology at University of Pharmacy in Monastir, Tunisia. She is responsible for the toxicology lab at assistance medical care and Emergency center, Tunis- Tunisia.

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Hana Eliasova et al., J Forensic Res 2016, 7:5(Suppl)
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Using dental age by estimation of chronological age in Czech children aged 3-18 years

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With the global migration of whole families, it is nowadays important to determine the actual Chronological Age (CA) of children and young people. Dental Age (DA) is preferred for the estimation of CA in children. Knowledge of dental age also significantly helps in endocrinologic diagnoses in children and in the design of orthodontic treatments. The assessment of DA is significant within the scope of the identification process of unknown dead bodies. Dental age estimation is based on the establishment of tooth development stages. The Demirjian methods to the assessment of the dental age are based on analysis of the orthopantomograms. 505 Czech healthy boys and girls aged 3-18.99 were radiographically examined at the Charles University, Prague. The factors of underlying diseases influence on the accuracy of the dental age estimation were mentioned. Descriptive statistics were used for statistical evaluation to compare deviations of the mean values chronological and dental age in each age group. Based on our results, methods Demirjian - original 7 teeth 1973 and Demirjian - revised 7 teeth 1976, appear to be the best methods for calculating the DA of healthy Czech children of both genders. The mean of paired t-tests for difference between DA and CA showed no statistically significant SD in either gender.

Biography

Hana Eliasova completed her PhD at Charles University. She is an authorized expert in Forensic Anthropology and the Head of the Department of Anthropology, Biology and Physio-detection in the Institute of Criminalistics Prague (Czech Republic). Her research work is focused on human remains examination and identification according to bones and teeth. She is a member of the National Disaster Victim Identification Team. She is an external educator at the Charles University in Prague and at the Masaryk University in Brno (forensic anthropology, trichology). She has published papers in reputed journals and also is a Member of an Editorial Board.

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Study on comparison of DNA detection rates in fire debris according to fire exposure temperature-time and distance to Ignition point

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DNA profiles from evidence found at crime scenes can be instrumental to identify a criminal in criminal investigations. But the key evidence from crime scenes often contains very little DNA or degraded DNA by heat and light. Fire investigation is the examination of fire-related incidents and similar to the examination of crime scenes. Fire investigation also includes surveying the damaged scene to establish the origin of the fire and eventually establishing the cause and the fire whether or not crime-related. It is difficult to determine whether arson has occurred because fire debris including the key evidence of fire origin is often seriously damaged or contaminated by fire fighting water, fire extinguisher besides fire. To clarify the correlation of DNA detection rates and evidence collection rates according to fire exposure temperature-time and distance to ignition point, in this study, we first analyzed fire investigation cases including arson cases in Busan metropolitan city where 350 million people live. For this purpose, we also conducted fire simulation experiments of DNA evidence samples. In addition, we performed a quantitative PCR (qPCR) assay to quantify total DNA and the extent of DNA degradation and we compared detection rates of STR profiles of blood, saliva samples in the fire exposure temperature condition at 100°C to 800^{0}C and distance to ignition point from 1 m to 3 m. STR profiles of blood sample were obtained in the fire exposure condition at 300^0, 10 sec to 60 sec. STR profile has not been detected or evidence disappeared in the fire exposure condition above 300^{0}C, 60 sec. The distance to ignition point is farther, more complete STR profiles and evidences were obtained.

Biography

Yang Jung Kim is the Chief of Busan Forensic DNA Smart Lab, National Forensic Service. She has completed her Master's degree from Busan National University and has worked for more than 15 years at Forensic DNA Division, National Forensic Service.

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Sigitas Chmieliauskas et al., J Forensic Res 2016, 7:5(Suppl)
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Murder mechanism in Lithuania from 2004–2013

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Deaths from firearms directly correlate with the number of weapons per 100 inhabitants in Eastern European countries. According to World Health Organization, in Bulgaria, Estonia, Poland and Latvia murders by instruments with a sharp cutting edge are dominant. In Bulgaria these deaths are executed in 51% of all cases, with the blunt force– 11%, firearms– 17%, asphyxiation-9%. In Estonia, homicides by sharp objects are executed in 44%, with the blunt forces– 41%, with the firearms or asphyxiation of 6%, burned –3%. In Latvia homicides by sharp objects are executed in 36%, with the firearms or asphyxiation– of 6%. In Poland homicides by sharp objects are executed in 63%, with the blunt forces– 48%, firearms– 4%. A statistical study of 1738 murder cases in Lithuania during the period of 2004–2013 was performed. 73% of men have been killed, dominant age group was 38–52 years. Deaths from blunt forces, such as, stone, stick, etc, were dominant (52 %). 33% of deaths were caused by sharp objects, 28%– kicking by hands or foots, 6%– firearms, 5%– asphyxiation, 3%– axe. 1% of deaths were caused by other physical factors, e.g., left at a helpless condition, firing, fall from heights, etc. Mostly it was killed by one type of weapon– 68%, two types– 30%, three types– 2%, four types– 0.3%. The asphyxiation mechanism was dominant among women. In Lithuania homicides by blunt forces are dominant and the murder number is decreasing.

Biography

Sigitas Chmieliauskas is a Medicine Doctor (PhD in Medicine), Assistant of Department of Pathology, Forensic Medicine and Pharmacology, Faculty of Medicine, Vilnius University, and also a Forensic Medicine Doctor of State Forensic Medicine Service, Lithuania.

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Pavel Timonov et al., J Forensic Res 2016, 7:5(Suppl)
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Non-metric sex determination from the distal humerus using hand-held laser scanner

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Background: The successful identification of human skeletal remains relies on new methods for sex determination.

Materials & methods: This research utilized 135 humeri from Bulgarian modern population (88 men, 47 women) to conduct a sex determination from the following features of distal humerus: olecranon fossa size and angle of the medial epicondyle.

Results: The quantitative assessment of humeral anthroposcopic landmarks using Hand-held laser scanner can be used as a good sex predictor. In the present study the variables are subjected to discriminant function analysis. Discriminant function score equations were derived for individual and combined variables from the lower end of the humerus of the Bulgarian forensic sample. The combination of olecranon fossa size and angle of the medial epicondyle provided the best result with 85.7% accuracy.

Discussion: The current forensic practice whereby criminals dismember the remains of their victims in an attempt to make their identification difficult requires that simple methods of sex determination from fragmented skeletal remains are available to forensic anthropologists and skeletal biologists. The distal humerus is an example of such bone fragments. The objectives of the present study were therefore to establish the standard numerical values for sex determination in Bulgaria.

Biography

Pavel Timonov has completed his PhD from Medical University-Plovdiv. He is a Chief Assistant Professor at the Department of General and Clinical Pathology and Forensic Medicine, Medical University-Plovdiv, Bulgaria. He has published more than 40 papers in reputed journals and 2 books concerning forensic anthropology, sex estimation and facial assessment. He is Editor-in-Chief of the *Journal of Forensic Medicine*. He is working on a research project "Cephalometric examination and 3D virtual modeling of the face aiming at construction and visualization of 3D facial statistics and creating cephalofacial database" funded by the Ministry of Education, Bulgaria.

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A forensic psychological paradigm on ethnoracial legitimacy and trust for police officer safety: The Ferguson effect

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Policing in the 21st century means that departments must consistently be mindful of perceptions and misperceptions of bias as it relates of police officer safety. In this case, recurring incidents of alleged police misconduct and excessive use of force along with what is viewed as a lack of accountability have been ongoing subjects of dispute for many years in diverse communities worldwide. For example, high profile incidents occurring in Ferguson, Missouri, Baltimore, Maryland and Charleston, South Carolina are problematic in that a significant amount of erosion in the trust in their own police departments and concerns about negligent hire or retention as well as officer safety. The complaints about police officers range from a variety of issues, with a sharpened focus on the selection of police officers. This discontent has resulted in communities feeling less confident in the process by which police officers are screened, selected, trained and supervised. When perceived high profile excessive force incidents occur, the screening and selection process of police officers is often questioned. High profile misconduct incidents occurring in Ferguson and Baltimore have sparked a series of protests due to the incidents raising questions among the public surrounding police misconduct. For example, the Ferguson incident started when two individuals were asked by the responding police officer Darren Wilson to move from where they were walking. One of these individuals (i.e., Michael Brown) fit the description of a man who was previously identified as a suspect in a convenience store theft. After Officer Wilson called out a dispatch about Brown, an altercation ensued which resulted in Wilson firing multiple shots ultimately killing Michael Brown. Wilson's testimony indicated that he believed Brown was reaching for a gun and charged toward him before he was shot. Although some witnesses on the scene stated that this was not the case, the officer claimed that he feared for his life. In time, a grand jury chose to not indict Officer Wilson in the shooting death of Michael Brown. The failure of the grand jury to indict Wilson seemed to fuel a "wave of anger" in the public. Buildings were set on fire, and there was widespread looting of businesses nearby. Officer safety was threatened as protestors threw a variety of objects at police officers, and the officers retaliated by using military-style equipment and tear gas to disperse crowds. This presentation uses a forensic psychological perspective to explore what has been dubbed the Ferguson Effect with respect to officer safety.

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The ethical advantages of using strengths based approaches to support the risk assessment of sexual offenders

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Risk assessment tools that predict sexual recidivism are an essential part of formal risk management planning processes. They are critical in helping criminal justice agencies deploy appropriate resources in accordance with perceived risk. Thus, they serve to protect the public from harm and manage public resources effectively. However, one of the consequences of a risk reduction approach is that while public protection concerns are addressed, the legitimate needs of the client tend to be ignored. Instead, because of the controls and restrictions placed upon them they become stigmatized and prevented from fully reintegrating back into society. A more ethical approach to risk assessment might be one that considers the strengths and needs of the client. Indeed, strengths based approaches enable people to build personal capacity, develop community and social bonds and ultimately contribute to society by living a meaningful and offence free life. Strengths based approaches inevitably serve the needs of the public, criminal justice agencies along with those of the client. However, little empirical evidence exists of the relationship between strengths based risk assessment approaches and public protection. This paper therefore presents the findings of a systematic review of the literature. Preliminary findings indicate strengths based risk assessment provides ethical advantages by: Improving risk prediction; developing meaningful treatment and rehabilitation plans; enhancing practitioner motivation; and improving the quality of client experience in the criminal justice system.

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The crisis in Ukraine and the impact on Crimea's Muslim population

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Since acquiring independence in 1991, Ukraine has suffered the consequences of never fully assimilating into Western Europe and has had to grapple with its corrosive relationship with Russia. The past twenty-four years have been tumultuous on many levels for Ukrainian citizens as the pursuit of a Western, democratic political structure was/has never been fully attained. Economic depression, political corruption and violent revolutions have greatly hampered Ukraine's ability to prosper independently as a liberal democracy. As this paper will show, the increasingly volatile political atmosphere in the Ukraine that climaxed with a violent revolution and forced exile of the Ukrainian president in combination with Russia's insurgence into Crime equates directly to a spike in religiously motivated political and physical attacks on Ukraine's religious minorities infrastructure, livelihood and civilians. In this paper, we focus on the situation Ukraine's Tartar Muslim population faces.

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The role of forensic accounting in preventing and detecting financial reporting fraud

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Organizations of all types and sizes are susceptible to employee fraud including embezzlements, thefts and misappropriations of assets as well as Financial Reporting Fraud (FRF) of disclosing a rosy picture of the organization. The 2016 Association of Certified Fraud Examiners (ACFE) Report to the Nations reveals that the "typical organization loses 5% of revenues in a given year as a result of fraud, which exceeded $6.3 billion, with an average loss per case of $2.7 million". The existence and persistence of FRF has undetermined the integrity and reliability of public financial information, eroded investor confidence, and has had detrimental effects on the safety, soundness and efficiency of financial markets worldwide. The very viability of the business as well as the safety and efficiency of financial markets in general are threatened when the existence and persistence of FRF go undetected. Financial reporting fraud can be detected with effective corporate governance, which includes effective antifraud policies and programs by the board of directors, management, and auditors. Effective antifraud programs of focusing on fraud awareness and education in the workplace environment, whistle-blowing policies and procedures, adequate and effective internal controls and the use of forensic accounting techniques can significantly reduce FRF.

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An easy and simple method to trace and identify footwear impressions

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Forensic investigators may encounter crime scenes that have shoeprints deposited on a variety of surfaces. The latent shoe prints are a key piece of evidence that can help find the suspect. Forensic Light Sources (FLS) have been used frequently in crime scene investigations as a scanning tool for crime scene evidence. LED based light sources are low in cost, portable, and easy to use; therefore, suitable for crime scene investigation and also are an excellent educational tool in forensic science classes. The Crime-lite 82L (Foster & Freeman) with white light (400-700 nm) is a high intensity FLS that provides a wide linear beam that is ideal for detecting surface debris in shoe prints in dust. During this research, we tested eight different surfaces - non-painted drywall, painted drywall, laminate flooring, linoleum, concrete, glass, wooden surface and slate and four different filters (red, green, blue, and yellow) mounted onto the white light to enhance contrast for floor residues while tracing footwear impressions. A large shoe print database (FPX; Foster & Freeman) was used to identify the make and model of over 190 shoe impressions successfully by tallying their discriminating features.

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The reliability of detecting digital photo alteration

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The present study is aimed to evaluate the reliability in using existing forensic methods to detect the possibility of digital photos being altered deliberately either to conceal evidence or to add misleading information. Does modern photographic technology make such detection more difficult? Does professional editing software such as Photoshop make such detection more unreliable? These questions are important to answer as they directly pertain to the credibility of digital evidence presented in court. We recruit forensic experts to examine a batch of digital photos in jpeg format, some of which have been deliberately altered digitally by a variety of software. The photos are generated from a variety of devices including cell phones of different brands and digital cameras of different brands. The experts are allowed to use whatever methods or tools at their disposal to determine which photos have been altered and more importantly what content has been altered. We then calculate the accuracy rate in these expert's efforts. The end is to explore whether a certain method is more reliable regardless of the expert and whether a certain type of device poses more challenges regardless of the expert. The preliminary findings do not bode well for the forensic community due to the low accuracy rates. For the most part, the expert's proficiency is not at fault. Rather, the true challenges seem to stem from the rapid advances of modern technologies in both the development of photography-related hardware and software.

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Forensic Sociology: Towards an integrated research agenda

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Investigative research' is a sociology-based framework but eminently suited to forensic science. Criminal behavior or activity (violence, extortion, robbery, or serial murder) is understood as an outcome of the intersecting influences of four principal social domains -along with their sub-dimensions of power and temporality. 'Psychobiography' traces 'perpetrators' psychological states of mind, intertwined with social involvements, emotions and preferred modes of interpersonal control -as they unfold over time. 'Situated activity' examines face to face encounters (between victims and perpetrators) and the importance of emergent meanings. 3] 'Social settings' are the proximate social locations of criminal activities and significantly influence criminal conduct. 'Contextual resources' (wider societal influence of such factors as -class gender, ethnicity and age) in both material (money, goods) and symbolic (values, beliefs) forms. Additionally, different (domain) forms of 'power & control' and 'temporality' significantly affect the unfolding narratives of crime. The strengths of such a program are: 1] Brings together sociology, psychology, philosophy, anthropology and other strands of forensic science to form a unified interdisciplinary research program, 2] Common focus around emotion and interpersonal control. 3] Integrated approach allows diverse, but complementary theories and research approaches, to work in unison, based on a unique combination of theory-testing and theory-generating approaches in the context of multi-strategy and mixed methods research.

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Detection of lamp amplified Amelogenin gene using a binary deoxyribozyme sensor

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Sex identification of unknown remains is crucial to personal identification of human remains in anthropology and forensics. When conventional methods, such as metric or morphological analysis, are not an option due to the fragmented or prepubescent remains, molecular diagnostics are needed. The amelogenin gene, found on sex (X and Y) chromosomes, is the most common molecular marker used for sex determination because it exhibits sexual dimorphism in size and sequence. Here we develop a new method for fluorescent and visual easy-to-use analysis of amelogenin gene for sex identification. In this assay, human DNA is amplified during a period of 15 min by isothermal loop mediated amplification (LAMP) followed by analysis by a binary deoxyribozyme sensors for 60-20 min. High selectivity of the amelogenin sequences of Y and X chromosome was demonstrated. The assay promises to simplify molecular-based sex determination of human remains.

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Police determination of suspected foul play in death cases involving a body that is found at the death incident site: A case series

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Researchers are increasingly studying the ways in which the police determine foul play in cases involving death, arson, missing persons, abuse and neglect, and other possible crimes. Using the results of The Police Classification of Foul Play Project, the following study relies on a case series of death incidents in which a body is found at the site of the death incident. The results from the case series reveal that the police are more likely to classify a death incident as involving suspected play rather than due to natural causes when a body is found at the death incident site. This study analyzes other socio-demographic, psychological and physical factors that may affect the ways in which police suspect foul play in death cases related to bodies that are found at death incident sites.

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Insect-driven forensics: Homicide investigation

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Insects are practically everywhere on Earth except the ocean and these hexapods are closely associated with humans. That makes important forensic bedfellows, whereas homicide involves two humans at a site, either indoor or outdoor. Aside relatively common indoor environment the outdoor scene and surrounding areas or natural settings are usually inhabited by good numbers of flying insects, particularly adult flies, namely blowflies (Diptera: Calliphoridae), each waiting for specific habitat in human environment to start a colony, as blooded or decomposing cadaver is located at the scene. That attracts surrounding flies and they find a suitable microhabitat in a short timeframe where eggs are laid. These eggs are then hatched and larval development begins after incubation and whose timeframe varies by species and ambient temperature at the scene. At this point, forensic investigation is to closely study and collect live samples that then fixed in standard preservatives. These samples become the forensic pivot for determining the time of death. However, it is often bypassed or missed of collecting necessary samples with proper labeling that include detailed description of the larval development. That must become a standard aspect of scene investigation and is closely linked to and becomes a part of forensic autopsy and likewise needs to be included in training for forensic investigation. This presentation includes some other basics including the intricacy of forensic entomology that could advance the core of forensic investigation.

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Proposal for standardization of coding staff by including the number of bases DNI thermo- acid resistant dentures in patients attending the Faculty of Dentistry, University of Buenos Aires city for forensic identification purposes

Alan Diego Briem Stamm
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Background: As a result of the multiple manifestations of violence, dental forensic identification can be difficult to conduct due to the state of a body or human remains, caused by damage of soft tissues, removal of fingerprints, and tooth decay. There is also the possibility that the individuals are edentulous and wear dentures, which can be an obstacle. However, this condition can be solved by using effective denture labeling recognition methods for identification.

Aim: To describe techniques, tags, and tagging devices of dentures and analyze their usefulness for dental forensic identification processes and medical-legal documentation in edentulous individuals who were rehabilitated with dentures.

Methods: A systematic literature review was performed through PubMed of publications describing a technique, label, or marking device used as a means of identification within the dental forensic context.

Results: 53 publications describing techniques, labels, or marking devices of dental prostheses, which have been introduced since 1958, were obtained.

Conclusions: The marking of dentures provides ante-mortem information to guide the identification of individuals and/or their human remains. However, the definite identification of a corpse is not only important for humanitarian and emotional reasons, but also for legal and administrative purposes. During the human identification process, all necessary information is gathered from the unknown body of the victim and hence that an objective reconstructed profile can be established. Denture marking and labeling systems are being used in various situations, and a number of direct and indirect methods are reported. Is proposed that national identity number (IDN) be incorporated in all removable and fixed prostheses, so as to adopt a single and definitive personal identification code with the aim of achieving a uniform, standardized, easy, and fast identification method in patients treated at the Faculty of Dentistry at the University of Buenos Aires for forensic identification.

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Forensic age prediction in bone samples

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Forensic age prediction provides key information to be used as a tool for DNA intelligence in order to guide police investigations (if absence of suspects or DNA databases entries occurs). Recent discoveries of age-correlated epigenetic signatures such as DNA methylation on CpG sites through the genome were used to design age prediction models to be applied to forensic biological stains. Recently, our research group developed a forensic age prediction system based on seven DNA methylation biomarkers (CpG sites) detected under EpiTYPER technology. The prediction model was constructed using 725 DNA blood samples from European population and was based on quantile regression analysis, providing a median absolute prediction error of ±3.07 years. The prediction system was already implemented in Snipper Forensic Classifier with open access to customers. The simultaneous calculation of the corresponding age prediction intervals besides the estimated age becomes a great advantage, allowing more accurate predictions in certain sample groups as young subjects. In the present work, further assessment of our model was carried out in order to be reduced and adapted to be applied to data derived from the Illumina HumanMethylation450 Bead-Chip. Moreover, additional forensic tissues such as bone samples were subsequently evaluated. Prediction accuracies are outlined and discussed.

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Biometrics solves the crimes: Science fiction or science fact?

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Biometric is any measurable, robust, distinctive, physical or behavioral characteristic of an individual that can be used to identify or verify the identity. There are two types of biometrics which fall in category of science facts that have many applications in forensic practice, they are: Physiological biometrics which include: Fingerprint, facial recognition, hand geometry, iris pattern and retinal scan and behavioral biometrics include: Voice recognition, signature verification and keystroke dynamics. Another types of biometrics which fall in category of science fiction as brain finger printing which is a scientific technique to determine whether or not specific information is stored in an individual's brain so as to identify the perpetrator, brain fingerprinting is a computer-based test that is designed to discover, document and provide evidence of guilty knowledge regarding crimes. Electrical brain responses can be a reliable indicator of information-processing activities in the brain. Event-related potentials (ERPs) are specific, simple, positive and negative voltage changes that take place during the information processing of a particular stimulus. These changes occur only when a person is selectively attentive to a stimulus, and they are elicited only in circumstances in which he/she is required to distinguish one stimulus (the target) from a group of other stimuli (the non-targets). P300 is a specific ERP component that has the potential for detecting concealed information in the brain. This testing determines objectively whether or not certain information is stored in the brain, regardless of any false or truthful statements the subject may or may not make about it. Brain finger printing has many applications in National security (counter terrorism), criminal justice system, medical diagnosis and others.

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Fingerprint visualization on clothing using Lumicyano

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Fingerprints are one of the most common types of evidence found in crime scenes. On the other hand, due the surfaces where they can be deposited, fingerprints are not always easy to visualize. This paper aims to expose a research done in London with a new chemical: Lumicyano. Visualization of fingerprints on clothing can be important in contact crimes as murder and rape to prove that offender was in contact with at least the piece of garment from victim. In order to understand if it was possible to visualize fingerprints with Lumicyano on clothing, 13 types of fabrics were tested and analyzed in black and white colors. Samples were chosen taking in account the most common types of fabrics used in London's population. Results were analyzed at naked eye but also with fluorescent lights; that revealed in some cases fingerprints with high quality detail. With more than 130 samples of fabrics analyzed, it was possible to conclude that this is a suitable technique to visualize fingerprint on garment. Dark samples obtained better results but in some white samples it was also possible to observe some details. This study aims to increase knowledge on the possibilities of visualizing fingerprints in porous surfaces which are usually more difficult to observe.

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Evaluation of anticancer potential of the medicinal plant *Wrightia tinctoria* (Roxb) R. Br., from South India

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After cardiovascular diseases, cancer is the second major cause of death in the western world and in European countries, each year over three quarters of a million people die from cancer. Although chemotherapy is effective in detecting cancer at a very early stage, the side effects and resistance towards drug are a major problem. The use of natural products has an exceptional value in the control of cancer and its eradication program. The compounds obtained from natural products significantly reduce tumor size and enhance the survival time. *Wrightia tinctoria* R. Br. belongs to family Apocynaceae commonly called as "Jaundice curative tree" in South India. In Siddha system of medicine, it is used for psoriasis and other skin diseases. In the present study leaf oil (Oil B) and ethyl acetate bark extract (EAB) of Wrightia tinctoria have been analyzed for *in vitro* cytotoxic properties by trypan blue dye exclusion technique using Dalton's Lymphoma Ascites (DLA) cell line. *In vivo* anti-tumor activity was studied against Dalton's Lymphoma Ascites (DLA) cells in Swiss albino mice by monitoring parameters like tumor volume measurement, survival time and tumor cell growth inhibition. The study revealed that both EAB and Oil B exhibited significant cytotoxic effect to DLA tumor cell lines. It has been found that the EAB at the dose of 200 mg/kg b. wt. and 50 mg/kg b. wt. significantly decreases tumor volume, increases life span of DLA induced ascites tumor bearing Swiss albino mice and reduces tumor cell growth rate in comparison to those of the standard cyclophosphamide (25 mg/kg b. wt.). *In vitro* anti-oxidant potentiality was tested using DPPH radical scavenging test, total phenol and flavonoid content and reducing power determination assays. The extracts showed significant antioxidant activity in a dose dependent manner. Anti-tumor properties of *W. tinctoria* could be linked with the presence of these antioxidant and cytotoxic activity. This may be used to develop effective therapeutic approaches towards the prevention or treatments of various immune conditions and different types of cancer. Recent studies revealed that the silver nanoparticles synthesized from *Wrightia tinctoria* showed remarkable antioxidant activity and silver nanoparticle are used in biosensors and numerous assays where silver nanoparticle materials can be used as biological tags for quantitative detection. This can help identify fingerprints, sources of ink and even residue from gunshots. The use of *Wrightia tinctoria* derived nanoparticles might be the future thrust in the field of forensic nanotechnology.

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Permanent maxillary canine tooth dimorphism: An ondontometric study for establishing sex identity in North Indian population

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Aim: To investigate whether sexual dimorphism can be established by odontometric study of permanent maxillary canine teeth as well as inter-canine width in north Indian population.

Study design: The study was carried out at Department of Oral and Maxillofacial Pathology, King George's Medical University, Lucknow, India on students and patients reporting at OPD. Out of total 250 subjects examined 125 subjects were female and 125 were male. Impressions of the upper arch were made using alginate and casts poured in dental stone. The mesiodistal diameter of the crown of permanent maxillary canine both on right and left sides and inter-canine width were measured. From these measurements, maxillary canine index was calculated. The percentage of sexual dimorphism was assessed for all the parameters.

Results: In the present study, the mesiodistal diameter of maxillary canine for both right (p=0.001) and left side (p=0.005) was significantly higher among male subjects than females, Similar observation was found for inter-canine width too (p=0.0001). However, the maxillary canine index for right and left was almost similar (p>0.05) for both male and female subjects. The sexual dimorphism in right and left mesiodistal diameters of maxillary canine was 4.2% and 3.6% respectively. For, inter-canine width it was maximum i.e. 13.7%. However, sexual dimorphism in right and left canine index showed negative values i.e. -2.1% and -0.9% respectively.

Conclusion: There was sexual dimorphism in mesiodistal diameter and inter-canine width of permanent maxillary canine teeth. Sexual dimorphism was more on right permanent maxillary canine teeth than left permanent maxillary canine.

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John Wilkes Booth (1838-1865) and Lewis Thornton Powell (1844-1865): Controversial identifications of two southern conspirators found guilty of Abraham Lincoln's death

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On April 14, 1865, at about 10:10 pm, a man shot Abraham Lincoln in the back of his head at point blank range. His name was John Wilkes Booth. The President of the United States died the following day. Meanwhile, a man broke into William Seward's office, the Secretary of State and seriously wounded his face. The attacker's name was Lewis Thornton Powell. Both of these men succeeded in leaving the American capital without any trouble. However, few days later, Booth was arrested in a farm in Virginia and was summarily executed. His body was repatriated and an autopsy was conducted on April 27, 1865. While the report was absolutely positive concerning the murderer's identification, the journalists remained doubtful. Were we definitely sure it was Booth's body? As for Powell, he was arrested three days later. He was judged and sentenced to death. But examinations resulting from his trial have shown dental idiosyncrasies which turned to be crucial in the identification of a skull discovered several years later.

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