

## **Effect of occupational therapy using visual stimulation children with autism**

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Autism is a pervasive neurodevelopmental disorder that is characterized by deficits in social interaction and communication and restricted interests and/or repetitive behavior. Other commonly reported features associated with autism spectrum disorders (ASD) include sensory processing over- or under-sensitivity.

The functional architecture of the visual cortex has helped shape the traditional view that visual input is processed serially, in a bottom-up cascade of cortical regions that analyze increasingly complex information. This view has been challenged by models proposing a simultaneous bottom-up and top-down flow of information in the cortex.

Visual perception is commonly conceptualized as hierarchical, with input arriving in area V1 from the thalamus, and being successively processed in a number of different areas. Neural response properties vary along the visual hierarchy, with latency increases that imply more complex processing when moving from earlier to later areas such as the infero-temporal cortex. Receptive field sizes also increase, implying convergence of inputs from lower-to higher-level areas. Low-level integration begins to take place once simple local features, such as the orientation and location of edges, are extracted from primary visual input in areas. The outputs of these areas, which are comprised of local representations are then gradually consolidated, binding together different stimulus features to represent a global or overall shape at successive levels. In the visual cortex (V1), on the other hand, after extensive training in a visual discrimination task, there is no significant change in the cortical area representing the trained part of visual space, nor in certain simple RF attributes.

An important function of our visual system is to de-

tect rapid change in the visual environment that could have behavioral significance. The speed of detection and sensitivity of detection are improved by allocating selective attention to the regions of the visual field where the stimulus change is likely to occur. Moreover, increased task difficulty reduces the interference caused by peripheral distracters, making the distracters more unlikely to deviate the focus of attention. Sensory atypicalities, such as hyper- and hypo-reactivity and differences in the processing of sensory information are increasingly recognized as being associated with autism. These atypicalities have recently come to the fore with their inclusion in the revised diagnostic criteria for autism [American Psychiatric Association, 2013], implying that they are hallmarks of autism.

**Keywords:** Rehabilitation, Autism, thalamus, neuro-development

## **Basic Health Information System in 2020**

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The health information system in Kosovo has been trying for a few years to evolve from a paper-based systems towards an electronic information systems for the management of health processes and health data. So far, we observed a combination of paper based and limited use of the Health Information System within healthcare facilities.

Good governance in health care requires reliable and timely information to plan, manage, and measure progress in attaining health objectives. The Ministry of Health over the last-years has been focusing on two parallel processes; creating an enabling environment by improving and investing in IT infrastructure, and developing/implementing an integrated information system for health-care providers. The Health Information System (HIS) Department, in cooperation with the external partner, has progressed with the implementation of a comprehensive nation-wide information system, so called Basic Health Information System. The system pools information from different sources, sufficient for data analysis at the micro, meso, and macro level. Concerning infrastructure, MoH is utilizing the computers from the old HIS software - where it was implemented previously - and investing in the rest of the area to provide the necessary equipment.

In retrospect, following the discontinuity of Health Information System (HIS), the idea/need for a “basic” HIS was noted within the Restructuring Paper of Kosovo Health Project of the World Bank in 2018, mainly as a web application to capture base information for registered patients, to enable uninterrupted implementation of capitation based performance payment (CBPP). CBPP scheme has been a mechanism designated for primary level of health care, which

began implementation in 2017 by MoH in cooperation with the World Bank, under the aim of improving access to quality PHC services. Observing its capacities, flexibility, and suitability to the country-context, the system was decided to adopt few modifications and roll-out as the integrated Basic Health Information System.

**Keywords:** Health, Healthcare, Healthcare Systems, Healthcare Information

## **Multi-Ethnicity diversity of polymorphism within the TAS2R38 gene and phenotypic correlation with bitter taste perception**

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Polymorphism is common in nature; it is related to biodiversity, genetic variation, and adaptation. Polymorphism usually functions to retain variety of form in a population living in a varied environment. The most common example is sexual dimorphism, which occurs in many organisms. Polymorphism can be maintained by a balance between variation created by new mutations and natural selection (see mutational load). genetic variation may be caused by frequency-dependent selection. multiple niche polymorphism exists when different genotypes should have different fitnesses in different niches.

Bitterness is natural taste component which protects us from consumption of plant toxins. G- protein-coupled receptors (GPCRs) bind with bitter substance like Phenylthiocarbamide (PTC) and transmit signals to the brain where flavour perceived. Three SNPs of TAS2R38 gene are responsible for individual's ability to taste bitter compound.

The study design was a questionnaire and Laboratory based study

Study participants of Coventry University filled Food consumption questionnaire about age, gender, Ethnicity, favourite fruits and vegetables and preferences for bitter fruits and vegetables. Saliva sample was collected from all participants followed by PTC strip and Dye testing including photography of dyed tongue tip. Then restriction fragment length polymorphism (RFLP-PCR) with gel-electrophoresis was done on extracted and amplified amplicon of DNA including digestion with enzymes (HaeIII, RsaI, Eco47III, and Fnu4h). DNA- Sequencing was also done to confirm RFLP-PCR results. Statistical analysis was done by using SPSS, One-way ANOVA, Principal component analysis and Descriptive statistics.

Total study participants were 32 (Female/male ratio was 2:1) with the age group 18- above 40 years. Bitter fruits and vegetables consumption trend of liking and disliking was more in age group 18-30 and then decreases with the increase of age which was confirmed with Principal component analysis of bitter vegetables  $p=0.01$  and bitter fruits  $p=0.00$ . It was also confirmed by Bartlett's test  $p=0.002$ . PTC tasters were mostly white females followed by Asian Pakistani females. PTC has no significant correlation with age, gender and Ethnic backgrounds ( $p=.375$ ). However, DNA concentration in the saliva sample was highest in Asians. An average number of taste buds were 21.75/cm<sup>2</sup> in supertasters, 19.8/cm<sup>2</sup> in mild tasters and 18.1/cm<sup>2</sup> in nonstarters.

There is a significant correlation between bitter fruits and vegetable consumption with age which decreases with the increase in age. However, due to lack of genotypic results, multi- ethnicity diversity of polymorphism within the TAS2R38 gene was not analysed. However, the phenotypic correlation was seen with bitter taste perception by counting fungiform papillae. Which were highest in number in supertasters, followed by less in mild tasters and very less in non-tasters.

### **KEYWORDS**

RFLP-PCR, Gel-electrophoresis, and genotype.

## **Cell cycle arrest and induction of apoptosis in human cancer cells lines by date palm kernels extracts and isolated cytotoxic compounds**

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This study conducted to identify the mechanism of cell death that induced by these isolated flavonoids, either by induction of apoptosis or necrosis. Three flavonoids namely nobiletin (NOB), tectorigenin (TEC) and persicognin (PERSI) were isolated from the optimised extractable polyphenols (EPP) crude extract of date palm kernels (DPK). The effect of crude EPP, NOB, TEC, PERSI and the non-extractable polyphenols (NEPP) from DPK and paclitaxel on human lung cancer A549 and human colon cancer HT29 cell lines and on the normal murine fibroblast 3T3 cell line were investigated using MTT crystal violet and trypan blue exclusion assays.

Apoptosis, one type of programmed cell death, is a well-defined self-suicide process counteracting tumor growth. Many chemotherapy drugs produce antitumor effects by triggering the apoptosis through a variety of molecular mechanisms. Apoptosis is either created by death receptors, which are called extrinsic pathway utilizing caspases 8 and 10. The other pathway is mitochondrial path or intrinsic pathway involving caspase. Recognizing involved mechanisms in cancer development is of great importance for developing neoplastic treatment.

The morphological changes of treated cells inspected by light inverted microscopy. Cell cycle progression using propidium iodide staining examined by flow cytometry. The apoptotic effect of the crude extracts and purified compounds were investigated using annexin V-FITC and propidium iodide staining. The underlying mechanism of apoptosis induced by crude extracts and the isolated compounds was investigated using caspase-3, -8 and -9 assays and the mitochondrial membrane potential assay. The findings indicated that the both DPK extracts and purified phytochemicals

did exert induced cell death on A549 and HT29 cell lines. The results perceived from MTT- assay and trypan blue exclusion showed that the cytotoxic effects of the plant extracts and the isolated compounds are dose-dependent with higher cell death within 72 hours treatment. Treatment of human lung and colon cancer cells with EPP, NOB, TEC, PERSI and NEPP induced late stages of apoptosis, as there was indication of the DNA degradation and high percentage of the cells population situated at sub-G1 phase, indicating a high population of apoptotic cells. Study of the apoptotic mechanism demonstrated that EPP and NEPP exhibited dependent mitochondrial signalling pathway as seen with caspase-9 and induced receptor-mediated (extrinsic) apoptotic pathway as seen with caspase-8. Therefore, our results suggest that DPK extracts and the three isolated flavonoids could be worthy candidates for developing anticancer agents.

**Keywords:** Apoptosis, date palm kernels, cancer cell lines, flavonoids, polyphenols.