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trum disorder. With an estimated prevalence between 1 in 100,000 to 250,000 people worldwide, BBSOAS has been diagnosed in more than 300 patients[2]. However, more cases are being reported yearly, suggesting that this frequency might be underestimated. There is currently no cure for BBSOAS, but with early intervention and appropriate therapies, it is possible to improve the quality of life of affected children. To contribute to our understanding of the pathophysiology of the disease, this study focuses on electron microscopy analysis of brain tissues using a mouse model of BBSOAS. Both juvenile and adult Nr2f1-het mice were examined ultrastructurally to detect any changes in the thickness and shape of the myelin fiber and the size of the mitochondria in the cerebral cortex. The results indicate a reduction in the thickness of the myelin sheath and loss of its characteristic multilaminar structure, a reduction in neurofilaments in the axoplasm, and abnormalities in the mitochondrial morphology. Our results align with what was previously reported at the optic nerve level[3] and highlight new alterations that open novel perspectives for future investigations on the pathogenesis of BBSOAS in other brain areas.

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OILS FROM SICILIAN WHITE AND RED GRAPE SEEDS EXHIBIT POTENTIAL ANTI-TUMORAL AND ANTI-DIABETIC PROPERTIES: *IN VITRO* PRELIMINARY STUDIES

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Vitis vinifera (Linneo, 1753), possesses numerous health-promoting properties, such as antioxidant and anti-aging effects[1]. Here, we evaluated the possible antiproliferative and cytotoxic activity of white (Catarratto/Insolia/Grillo mix) and red grape (Sangiovese) seed oils on colon (CaCo-2) and liver (HepG2) cancer cells. Differentiated non-tumoral CaCo-2 cells were tested in parallel. MTT assays[2] showed that Caco-2 cells were more sensitive than HepG2 cells to the viability-restraining effect of the oils, especially the white one, and the IC_{50} values were evaluated. Interestingly, both oils exerted no toxic effect to differentiated Caco-2 cells, suggesting their possible biocompatibility with the normal intestinal microenvironment. Further investigation on cell cycle perturbation upon 24h treatments with IC_{50} of white grape seed oil revealed an increase of the sub-G_0G_1 fraction in both cancer cell lines, suggesting the occurrence of DNA fragmentation. Whether this aspect is linked to the promotion of apoptosis is still an object of study. A second line of research was focused on the evaluation of the impact of 24 h-exposure to the minimum non-inhibitory concentration of seed oils on glucose metabolism in HepG2 cells, which, although tumoral, maintain many differentiated hepatic functions. PAS reaction and glucose uptake assays[3] showed that both oils acted as potential anti-diabetic supplements, determining the increase of glucose consumption and intracellular glycogen accumulation. The preliminary data obtained in both lines of research represent a good starting point for a deeper molecular investigation on the beneficial effects of grape seed oils and their applications.

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THE USE OF ARTIFICIAL INTELLIGENCE IN ASSISTED REPRODUCTION: SPERM SELECTION

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The World Health Organization (WHO) estimates that 9% of couples struggle with infertility and that male factor contributes to 50% of the issues[1]. In assisted reproductive technology (ART), a crucial step is to select competent spermatozoa for intracytoplasmic sperm injection (ICSI). However, the methods mimicking natural selection processes occurring in the female reproductive tract – *e.g.*, swim-up, centrifugation on density gradient, selection based on morphology - are time-consuming, subjective, and may cause damage to the sperm[2]. We addressed the potential of artificial intelligence (AI) algorithms in sperm cells selection, thanks to large-data processing capabilities, objectivity and improvement over time, as more robust datasets become available for training. AI-based image analysis allows recognition of patterns unperceivable to the eye[1]. Multiple tools have been developed, such as computer-aided sperm analysis (CASA), which can assess large amounts of the sperm cells, though unable to perform single-sperm analysis. In the present study, we employed Sperm ID (SiD), an individual-sperm identification system, assisting the embryologist during ICSI. This novel AI tool detects motile spermatozoa, using a digitizer connected to a microscope. Evaluation of morphological and motility features is used by SiD to rapidly identify the best spermatozoa in the sample, assigning a color to each spermatozoon (green, yellow or red), based on its quality[3]. Samples from sixteen volunteers were analyzed by evaluating the average concentration of sperm selected by the software and comparing them with the values of the classic spermiogram. It was possible to show that the SiD correctly recognizes spermatozoa, based on their motility, but this is also influenced by morphology and sperm concentration in the starting sample. However, the system is unable to analyze all the spermatozoa present in an observation field. While the system needs to be further tested to recommend AI employment in sperm selection, we support the hypothesis that such applications are most promising in the field of ART.

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