

### **301. MICRO-ARN – A NEW CLASS OF BIOMARKERS AND THEIR ROLE IN NEUROLOGICAL DISEASES**

Author: **Daniel Ruban**

Scientific adviser: Veronica Sardari, PhD, Associate professor, Department of Biochemistry and Clinical Biochemistry, *Nicolae Testemitanu* State University of Medicine and Pharmacy, Chisinau, Republic of Moldova

**Introduction.** Many studies have suggested that miRNAs can be important biomarkers in a variety of pathologies, including cancer, diabetes, cardiovascular diseases, aging, asthma, autoimmune, kidney and neurodegenerative diseases (NDDs). A significant fraction of miRNAs is specifically expressed in the central nervous system and plays a role in neuronal development. Consequently, it seems natural that miRNAs have been linked to NDDs as such as Alzheimer's, Parkinson's and Huntington's disease, which are caused by excessive neuronal death in the damaged brain. Due to the potential of miRNA as biomarkers, several studies have predicted that monitoring methods for miRNAs will be extensively useful for curing these diseases in the near future.

**Aim of the study.** To elucidate the role of miRNA as a biomarker in neurodegenerative pathological processes.

**Materials and methods.** To achieve the proposed goal of the study has been performed the literature analysis, using 125 bibliographic sources published during 1989-2020 in PubMed, Medline, MedScape and Hinari electronic libraries.

**Results.** The results of high efficiency sequencing experiments suggest that the number of miRNAs expressed in human brain should be over 1000. A number of studies have revealed that specific miRNAs are differentially expressed in the human brain and, more importantly, some of the miRNAs modulate genes associated with specific neurodegenerative disorders. Harraz et al. showed that among the sequenced 224 miRNAs, miR-133b, miR218-2, miR-15b, miR101-1, miR107, miR-335, and miR-345 were notably regulated in Parkinson Disease (PD) patients. Other miRNAs have been associated with Alzheimer diseases (AD), such as miR124, miR-132, and miR-153. Many miRNAs are involved directly or indirectly in other neurological disabilities, such as epilepsy, amyotrophic lateral sclerosis (ALS), traumatic brain injury, and prion diseases. Recent studies have highlighted the impact of numerous miRNAs on the pathogenesis and progression of NDDs. However, comprehensive profiles of the effects of different sets of miRNAs that are related to a specific disease remain elusive.

**Conclusions.** The current evidence clearly points to a significant role of miRNAs in NDDs. The miRNAs study is particularly promising for understanding the very prevalent, but poorly understood sporadic forms of NDDs, such as AD and PD. Now the challenge is to understand the role of specific miRNAs in biological models and to translate this knowledge to clinical studies.

**Key words:** micro-RNAs, biomarkers, neurodegenerative diseases.

### **302. VITAMIN D AND ITS ANTI-CANCER EFFECTS**

Author: **Ana Stolareenco**

Co-author: Olga Morozan

Scientific adviser: Ala Fulga, PhD, University Assistant, Department of Biochemistry and Clinical Biochemistry, *Nicolae Testemitanu* State University of Medicine and Pharmacy, Chisinau, Republic of Moldova

**Introduction.** Vitamin D or "vitamin of the sun" is well known for its anti-inflammatory and immunomodulatory effects, prevention of osteomalacia and osteoporosis and influence on the metabolism of calcium and bones. In addition, it prevents diabetes, multiple sclerosis, cancer, heart disease and even depression. Therefore, studies show that vitamin D, which the human body produces through its exposure to the sun, can reduce the risk of colorectal cancer, breast cancer, ovaries, prostate or any other type of cancer. It also influences many physiological processes, including muscle function, cardiovascular homeostasis, nerve function, cell integrity and immune response. A lot of studies show that this vitamin fights cancer by encouraging cell differentiation, preventing cell growth, inducing apoptosis and preventing the formation of blood vessels within tumors. Following observational studies, it has been noted that the high prevalence of vitamin D deficiency, combined with the discovery of increased risks of certain cancers, suggests that vitamin D lack may account for several thousand annual premature cancer deaths.

**Aim of the study.** The purpose of this study was to present the main conclusions about vitamin D and its effects in cancer prevention and treatment. This finding creates a new impetus for providing suitable vitamin D intake to reduce the risk of cancer.

**Materials and methods.** The review was performed by searching the PubMed database including publications on the etiology and prevention of chronic vitamin D. The most relevant literature was revised from 2010-2019.

**Results.** In vitro and animal studies indicate that vitamin D may have anti-cancer benefits, including against the progression and metastasis of a wide spectrum of cancers. This is because human cells are capable of metabolizing 25-hydroxyvitamin D in 1,25-(OH)-2D, the reaction being catalyzed by enzyme 1- $\alpha$ -hydroxylase (CYP27B1). The combined presence of 25-(OH) D-1 hydroxylase as well as the specific receptor in several tissues introduced the idea of a paracrine role for 1,25-(OH) 2D. Furthermore, it has been shown that 1,25-(OH)-2D promotes cell differentiation and has anti-inflammatory, pro-apoptotic and anti-angiogenic actions, and also inhibits the proliferation of cancer cells.

**Conclusions.** Vitamin D deficiency and insufficiency are closely linked to the increased prevalence of cancer. Thus, vitamin D can be administered within the norm (250-500 nmol/L) to prevent cancer as well as against its progression and metastasis. Therefore, the academic environment, public funding agencies and industry should urgently design appropriate studies in order to define better the causal relationship between vitamin D nutrition and cancer, as well the optimal vitamin D nutrition based on an accurate measurement of 25-(OH)-D, and inform the public and medical profession accordingly.

**Key words:** vitamin D, 25-hydroxyvitamin D, prevention, cancer.

### 303. LACTOSE INTOLERANCE: MISBELIEF AND REALITY

Author: **Teodora Stratu**

Scientific adviser: Ala Fulga, PhD, University Assistant, Department of Biochemistry and Clinical Biochemistry, *Nicolae Testemitanu* State University of Medicine and Pharmacy, Chisinau, Republic of Moldova

**Introduction.** Nowadays a common misrepresentation of lactose intolerance, perpetuated by advertising of lactose-free diets, low-lactose products, the increased popularity of veganism has led to the exclusion of lactose containing foods.