VIII. INTERNATIONAL CONGRESS OF MOLECULAR MEDICINE

09-12 NOVEMBER 2021



Molecular Aspects of Human Wellness

CONGRESS BOOK

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Dear Colleagues,

On behalf of the Organizing Committee I am delighted to invite you to the 8th International Congress of Molecular Medicine that will be held in Istanbul, Turkey on 9th – 12th of November 2021 under the auspices of the Turkish Society of Molecular Medicine and Istanbul Yeni Yüzyil University, Faculty of Health Sciences.

Congress program will consist of outstanding lectures, including keynote talks, plenary sessions, oral & poster presentations & exhibition.

The congress biennial of molecular medicine is an important forum for researchers and clinicians from Turkey and all around the world to focus on the latest developments in molecular medicine.

Trends, technologies and clinical applications in areas including, “Tumor Biology”, “Anti-Cancer Agents”, “Sportive Performance and Genetic”, “Nutrition and Epigenetic Aspects”, “Metabolic Syndrome”, “Prospective Methods in Molecular Medicine“, Molecular Aspects in Diabetes” , “Molecular Metabolic Syndrome” shall be discussed during the congress.

Istanbul Yeni Yüzyil University aims to bring the scientists needed by the society into the country and to become a higher education institution and centre of excellence connected to Atatürk's principles and reforms, aiming to educate knowledgeable, contemporary, equipped and experienced young people who are useful to the society.

Taking into account the developments in the world, this university considers itself responsible for the upbringing of the workforce trained at associate, undergraduate, graduate and doctoral level to exceed the level of civilization academically and technologically and to contribute to researches and studies. To this end, Istanbul Yeni Yüzyil University provides universal education in different disciplines in cooperation with stakeholders such as government institutions, private sector and civil society institutions and organizations with its expert and experienced academic staff.

We are looking forwards to meet you in Istanbul on November 2021 for this outstanding congress and we hope you will enjoy scientific sessions, as well as Turkish hospitality and all the beauty of the Istanbul.

Prof. Dr. Ümit Zeybek

Chair of the Turkish Society of Molecular Medicine,
Istanbul University, Department of Molecular Medicine,
Aziz Sancar Institute of Experimental Medicine,
Istanbul, Turkey

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Main Theme

- Molecular Aspects of Human Wellness

Main Scientific Topics

- Tumor Biology
- Anti-Cancer Agents
- Sportive Performance and Genetic
- Nutrition and Epigenetic Aspects
- Metabolic Syndrome
- Prospective Methods in Molecular Medicine
- Molecular Aspects in Diabetes
- Molecular Metabolic Syndrome

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Molecular Aspects of Human Wellness

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INVESTIGATION OF THE EFFECT OF PACLITAXEL ON MIR-221 EXPRESSION IN BREAST CANCER STEM CELLS

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INTRODUCTION

Breast cancer is the most common malignancy and the leading cause of death among women in the world. Despite the development of early diagnosis methods and advances in treatment in recent years, it is still an important cause of mortality and morbidity (Adhami et al. 2018). It is known that many cancer types, including breast cancer, are driven by a population of cells displaying stem cell characteristics. These cells, called cancer stem cells (CSCs) or tumor initiating cells, are known to not only promote tumor initiation and growth, but also mediate tumor metastasis and therapeutic resistance (Yu et al. 2012). On the other hand, Breast cancer stem cells (BCSCs), consist of a small subpopulation of cells within the tumor mass that exhibit stem cell-like properties and are responsible for tumor development, recurrence, and metastasis in breast cancer (Liu et al. 2012). The complexity of control of gene expression in BCSCs is mediated by numerous signaling pathways, often triggered by extracellular signals, mutations, and epigenetic control. Recent studies show that abnormal activation of these pathways causes tumor development, increased tumor aggressiveness and treatment resistance in breast cancer (Takebe et al. 2011). Therefore, there is still a need for research and clinical use of new molecular biomarkers in the treatment of breast cancer. MicroRNAs (miRNAs) are non-coding RNAs consisting of 18-24 nucleotides. By inhibiting translation or regulating the stability of target mRNAs; they control cell proliferation, differentiation, invasion and apoptosis. Recent evidence shows that miRNA dysregulation in breast cancer is associated with CSCs and related signaling pathways (Zhang et al. 2014). In addition, chemotherapy; It is the most common and effective method used in the treatment of breast cancer. However, it is common for patients to fail to respond to treatment during chemotherapy or for cancer to recur after treatment. Although more than one anticancer drug is generally applied to achieve success in breast cancer treatment, drug resistance acquired later or existing before treatment greatly hinders success in breast cancer chemotherapy (Magee et al. 2012). Paclitaxel (taxol) is an important chemotherapeutic agent used in the treatment of solid tumors including breast, ovarian, lung, head and neck cancers. Paclitaxel, one of the taxoid group drugs from plant alkaloids, binds to the β-tubulin subgroup of microtubules during mitosis, prevents the conversion of microtubules into

tubulins and the destruction of spindle fibers formed during mitosis, and stops cell division. Although there is frequent resistance to various chemotherapeutic agents, including paclitaxel, in breast cancer metastasis and recurrence, the mechanism of resistance of breast cancer cells to paclitaxel is not fully understood (Zhou et al. 2010). Although miRNAs have proven to have important roles in drug resistance and tumorigenesis, the development of paclitaxel resistance and the interaction between miRNAs is still a topic of research. On the other hand, after determining that miRNAs act as regulators of gene expression, these RNA molecules were evaluated as both potential therapeutic targets and candidate diagnostic and prognostic indicators.

MATERIAL AND METHODS

In the current study, following paclitaxel treatment, differences in expression levels of let-7a, miR-155, miR-10b, miR-221, miR-222, miR-335, miR-145, miR-200c, miR-21 and miR-125b, which are important in breast cancer development, were investigated in parental MCF-7 and MCF-7s cells. In this direction, the obtaining of breast cancer cancer stem cells and the characterization of these cells were provided. Then, the cytotoxic activity of paclitaxel was determined and its effect on the spheroid structure was observed. However, parental MCF-7 and MCF-7s cells were treated with 15.93 μM dose of paclitaxel for 24 and 48 hours, and RNA isolation and cDNA synthesis were performed from these cells. Subsequently, changes in the expression levels of let-7a, miR-155, miR-10b, miR-221, miR-222, miR-335, miR-145, miR-200c, miR-21 and miR-125b were statistically evaluated in Sabiosciences PCR-Data Analysis (RT^2 profiler PCR array data analysis version 3.5) web-based program (StepOnePlus™, Real-Time PCR, Applied Biosystems™).

RESULTS AND DISCUSSION

Results revealed that, miR-221 was 28.37-fold upregulated after 24 h of paclitaxel treatment in MCF-7s cells *($p=0.0007$).* This finding, supported by further functional analyzes, may reveal that miR-221 can play an important role in breast cancer and cancer stem cell biology and can be used as an effective treatment option.

Acknowledgements

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