

*Materials of Conferences***HEALTH EFFECTS
OF MICROWAVE RADIATION**

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Electromagnetic waves come in a very wide range of wavelengths: there are radio, microwave, infrared (heat), visible light, ultraviolet, X-ray, and gamma-ray waves. All are used in medicine in one way or another. Microwave radiation is used in certain kinds of heat treatment, where the heat is generated in the target tissue (as in a microwave oven). Microwaves are a form of electromagnetic radiation with wavelengths ranging from one meter to one millimeter; with frequencies between 300 MHz (100 cm) and 300 GHz (0,1 cm). They are classified as non-ionizing radiation – radiation which can change the position of atoms but it is not strong enough to alter their structure, composition, or properties.

At the present time, there is substantial scientific fact that establishes negative health effects associated with the direct exposure to microwave radiation. Microwave radiation penetrates the body, the exposed molecules move about and collide with one another causing friction and, thus, heat. This is known as the thermal effect. If the radiation is powerful enough, the tissue or skin will be heated or burned. The scientific literature indicates a relationship between exposure to microwave radiation and birth defects, such as mongolism (Down's Syndrome) and central nervous system damage. It has been demonstrated that microwave radiation may cause eye and testicular damage due to their high vulnerability to radiation damage because they contain few blood vessels. As for the effects on the eye, several scientific investigations have shown that cataracts among humans and laboratory animals have occurred as a result of the intense heating of high frequency microwave radiation.

As noted, microwave radiation may also cause damage to the male testes/reproductive organs. Specifically, scientists have demonstrated that exposure to microwave radiation may result in partial or permanent sterility. In addition, some scientific evidence suggests similar effects associated with microwave exposure and female reproductive problems.

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**STUDY OF THE POSSIBILITY
FOR APPLYING OF POROUS SILICON
NANOPOWDERS AS A SYSTEM
FOR THE TARGETED DRUG DELIVERY
OF "VINPOCETINE"**Polkovnikova Yu.A., Prokhorova A.V.,
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Nowadays diagnostics and treatment of disorder of the cognitive functions is one of the most intensively studied areas of the modern neurology. Vinpocetine is one of the widely used medicinal preparations for the treatment of such kind of diseases [1]. Presently vinpocetine is produced in the form of pellets containing 5 and 10 mg of the drug. Such drug dosage form proves to be rather efficient but it does not provide the desired prolonged effect [2]. Moreover, chemical structure of vinpocetine can be the reason of instability of this drug dosage form.

Therefore, now an actual problem is the elaboration of stable and biocompatible drug dosage forms with the delayed release of vinpocetine.

One of the prospective ways for solution of this problem is the development of systems for the targeted drug delivery based on silicon nanoparticles including those ones obtained from porous silicon. It is well known that these systems are biocompatible and biodegradable [3]. Now quite successful attempts in the use of porous silicon nanopowders in the systems of the targeted drug delivery are presented in scientific community [4].

The purpose of this work is the elaboration of vinpocetine delivery system on the basis of porous silicon and the study of efficiency of the processes concerned with adsorption and desorption of the medicinal preparation in this system.

Materials and methods of research. Porous silicon nanopowder was obtained according to a standard procedure using electrochemical etching of silicon in the alcoholic solution of fluoric acid [5], followed by ultrasonic grinding. Specific surface area of the porous silicon nanopowder was of ~ 60 m²/g. Some features in morphology and composition of the particles used in the work are presented in [6].

The obtained nanopowder was submerged into 5%-solution of vinpocetine (ND 42-9175-03) for 20 and 60 minutes. Adsorption of the drug onto porous silicon was controlled by IR-spectroscopy method with the use of VERTEX 70 Bruker spectrometer. Kinetics of vinpocetine release from the nanoparticles into 0,1 M solution of hydrochloric acid was determined at the temperature of