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Актуальні питання створення нових лікарських засобів : тези доповідей XXIII Міжнародної науково-практичної конференції молодих вчених та студентів (21 квіт. 2016 р.). В 2-х т., Т.1. – Х. : Вид-во НФаУ, 2016. – 433 с.

Збірка містить матеріали науково-практичної конференції молодих вчених та студентів «Актуальні питання створення нових лікарських засобів». Матеріали згруповано за провідними напрямками науково-дослідної та навчальної роботи Національного фармацевтичного університету. Розглянуто теоретичні та практичні аспекти синтезу біологічно-активних сполук і створення на їх основі лікарських субстанцій; стандартизації ліків, фармацевтичного та хіміко-технологічного аналізу; вивчення рослинної сировини та створення фітопрепаратів; сучасної технології ліків та екстемпоральної рецептури; біотехнології у фармації; досягнень сучасної фармацевтичної мікробіології та імунології; доклінічних досліджень нових лікарських засобів; фармацевтичної опіки рецептурних та безрецептурних лікарських препаратів; доказової медицини; сучасної фармакотерапії, соціально-економічних досліджень у фармації, маркетингового менеджменту та фармакоєкономіки на етапах створення, реалізації та використання лікарських засобів; управління якістю у галузі створення, виробництва і обігу лікарських засобів; інформаційних технологій у фармації та медицині; основ педагогіки та психології; суспільствознавства; філології. Для широкого кола наукових і практичних працівників фармації та медицини.

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Topical issues of new drugs development : Abstracts of XXIII International Scientific And Practical Conference Of Young Scientists And Student (April 21, 2016). In 2 vol. Vol.1. – Kharkiv : Publishing Office NUPh, 2016. – 433 P.

Book of Abstracts includes materials of Scientific and Practical Conference of Young Scientists and Students «Actual questions of development of new drugs». Materials are grouped according to the main directions of scientific, research and educational work of the National University of Pharmacy. Theoretical and practical aspects of the synthesis of biologically active compounds and development of medicinal substances on their basis; standardization of drugs, pharmaceutical and chemical-technological analysis, the study of raw materials and herbal remedies development, modern drug technology and extemporal recipe; biotechnology in pharmacy, modern advances in pharmaceutical microbiology and immunology, clinical trials of new drugs, pharmaceutical care for prescription and OTC-drugs, evidence-based medicine, modern pharmacotherapy, socio-economic studies in pharmacy, marketing management and pharmacoeconomics during the development, implementation and use of drugs, quality management in development, production and trafficking of drugs; information technologies in pharmacy and medicine; basics of pedagogy and psychology; social science; philology are presented. For a wide audience of scientists and pharmaceutical and medicinal employees.

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# DEVELOPMENT OF MAGNETIC SOFT MEDICINAL FORMS WITH Ag@Fe<sub>3</sub>O<sub>4</sub> FOR THE CRYOTHERAPY

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**Introduction.** In the development of nanopharmacy ranks first plays magneto-containing medicines. As magnetic filler of the ointment compositions typically use a modified magnetite. One of the ways to optimize the existing methods for the removal of benign neoplasms of the skin is a search for fundamentally new approaches that, in turn, will give an undeniable effect.

Analysis of the literature sources shows that in practice, methods such treatment of neoplasms of the skin as surgical, cryotherapy, electrocoagulation or diathermocoagulation, chemical coagulation, laser method. Due to the positive aesthetic effect, virtually painless of manipulations, the simplicity of the procedure, the most common method is cryosurgery. This method of local action of low temperatures with a curative effect, in which the tissue to be removed, is subject to destruction (destruction) by freezing with liquid nitrogen.

In medical cryology have experience of using ointments and creams. The use of soft magnetic dosage forms is perspective in the cryology. Their advantage is determined by the fact that by using an external magnetic field can penetrate to a sufficient depth and due to the high thermal conductivity facilitate freezing of the entire thickness of the affected tissues.

Making of an ointment containing magnetite modified with silver provides the appearance of bactericidal, bacteriostatic and wound-healing properties of such a system, since silver ions help restore damaged skin tissue, destroying the old and the cancer cells, normalization of the inflammatory processes, etc.

**Aim.** Introduction of magnetite an ointment, consisting of a magnetic carrier with a silver-coated islet of the "core-shell"– Ag@Fe<sub>3</sub>O<sub>4</sub>, in the known method cryodestruction of skin neoplasms. The proposed ointment contains ingredients that provide anti-bacterial, analgesic, anti-inflammatory and wound-healing properties.

**Materials and Methods.** The object of research is the nanocomposite, which is part of an ointment intended for cryotherapy on skin neoplasms. Optimization of magnetite ointment includes the step of justification required properties of magnetically nanocomposite Ag@Fe<sub>3</sub>O<sub>4</sub> by: microbiological, magnetic properties medical and biological properties. Performing the experiment was performed in liquid nitrogen using a special portable apparatus for cryosurgery CRY-AC (Brymill) and contact cryoprobe with nozzles that are used depending on the shape and location of skin lesions.

**Results and Discussion.** According to studies of the magnetic properties nanoparticles composites such as Ag@Fe<sub>3</sub>O<sub>4</sub> selected sample, which has a strong performance of the specific saturation magnetization  $\sigma = 62.5$  emu/g.

Size of magnetite nanoparticles coated silver sheath insula – 23 nm, specific surface area of the composite is 145 m<sup>2</sup>/g thermal conductivity of magnetite  $\chi \sim 5.3$  W/(m×K), silver  $\sim 420$  W/(m×K). The presence of silver on the surface of magnetic nanoparticles making a significant additional contribution to the thermal conductivity of the composite, characterizing one of the valuable properties for use in cryosurgery. For all investigated indices sample corresponds to a mole ratio Ag/Fe<sub>3</sub>O<sub>4</sub> 1 : 0,5.

The screening of antimicrobial activity in terms of the impact on the composite strains of microorganisms and fungi has been carried out.

Biomedical researches are based on improving of the method of cryotherapy to pathological growths of the skin by the use of magnetically ointments with Ag@Fe<sub>3</sub>O<sub>4</sub> to the increasing of cryotherapy. For this purpose, magneto controllable ointments: I (superimposed before handling removal) and II (applied to improve and promote healing without complications and relapses) have been used.

The results obtained show that the use of the improved method can significantly improve the results of cryosurgical intervention by:

- Creating of close thermal contact of the tool with the entire surface of the affected area due to ointments I and ability to penetrate to a certain depth of the disease outbreak.
- Decreasing the time of freezing by 50%, and increasing the depth of penetration of the devastating effect of cold, reducing the operation time to 30 - 60 seconds.
- Providing the complete removal of the structured fabric with exudate by an external magnet.
- Prevention of infection and inflammation of the operated area due to the analgesic, anti-inflammatory and regenerative effects ointments II, which is applied after cryointervention.
- Reduction of post-operative recovery of 55%.

**Conclusions.** The magnetic characteristics of the studied nanocomposite Ag@Fe<sub>3</sub>O<sub>4</sub> are providing sufficient control of thermal conductivity and antibacterial activity of ointments due to the insula silver shell. Application of ointments based nanoparticles of Ag@Fe<sub>3</sub>O<sub>4</sub> for microsurgical interventions has its advantages: the ointment I - provides a deep and complete freezing of the tissues without damaging healthy skin, ointment II - has a bactericidal, anti-inflammatory and wound-healing ability. Its use significantly reduces the time of cryoablation and subsequent rehabilitation.