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Proceeding Paper

Conjugated Polymeric Liposomes: A Hybrid Carrier for Contemporary Drug Delivery †

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Abstract: Liposomes are artificial vesicles encapsulating the drug moiety. The structural adaptability of liposomes has been employed to make them drug carriers for smart delivery systems, improving bioavailability, stability, target delivery, etc. However, conventional liposomes have some drawbacks, like limited payload, shorter in vivo circulatory lifespan, unregulated releasing properties, rapid clearance from bloodstream etc. Polymeric modification of the liposomes addressed and effectively overcome all the drawbacks of conventional liposomes. Polymeric materials offers indefinite structural diversity thus a substantial portion of the materials has been employed for drug-targeting methods and controlled drug release. Conjugation of liposomes and polymers develops a hybrid vesicle with intermediary physicochemical and stimulus responsive properties (pH, temperature, etc.). The reliability of liposomes with respect to pH, nature of drug moiety, enzyme, and immune response can be strengthened by polymers. Polymer modified liposomes also enhances pharmacokinetic and pharmacodynamic profile of the drug moiety. The form of polymer, cross-linking agent, interaction, and bonding used during polymerized modification of liposomes all have an impact on their activity. According to the extensive review of the literature that is accessible in the different data sources, research in this field is proactively involved in the synthesis of newer polymeric materials, and the supramolecular structuring of the different chemicals.

Keywords: polymer; liposome; conjugation; physicochemical; hybrid vesicle

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1. Introduction

In 1964, at the Babraham Institute in Cambridge, British haematologist Dr. Alec D. Bangham first discovered liposomes. The words Lipos" which means fat and "Soma. which means body, are the origins of the term "liposome" referring to the lipids (phospholipids), the components that made up its structure [1].

Liposomes are tiny, spherical artificial vesicles that can be built using cholesterol and safe phospholipids having particles ranging in size from 30 nm over micrometres [2]. The liposome has distinctive lipid bilayers which matches the cell's plasma membrane, is an efficient and secure format for administration by entrapping the drug moiety.

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Development and Validation of RP-UHPLC Method for Determination of Sertraline in Bulk Drug and Dosage Form †

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† Presented at the 26th International Electronic Conference on Synthetic Organic Chemistry, 15–30 November 2022; Available online: https://ecsoc-26.sciforum.net/.

Abstract: Objective: The new, rapid, sensitive, simple, precise and accurate Reversed-Phase Ultra High Performance Liquid Chromatography (RP-UHPLC) method was developed and validated for determination of Sertraline in bulk drug and Pharmaceutical dosage form. Method: The UV Spectrum of Sertraline in water showed maximum wavelength at 273 nm. In RP-UHPLC method separation achieved by Agilent C18 (75 mm × 3.9 mm, 2 µm particle size) column using Acetonitrile: (0.1% OPA) Water (80:20 *v/v*) as mobile phase at flow rate 0.7 mL/min. Injection volume was 20 µL. RP-UHPLC detection carried out at 273 nm. Results: In RP-UHPLC method retention time was found to be 3.75 min. The Calibration curve was found to be linear ($r^2 = 0.999$) with concentration range of 10–50 µg/mL. The Accuracy (% recovery) for Sertraline was found to be 99–100%. The % RSD (intra-day and inter precision) values are not more than 2% hence the developed method is accurate and precise. The LOD and LOQ were found to be 0.2085 µg/mL and 0.6321 µg/mL respectively. Conclusion: The developed method was validated with respect to linearity, accuracy, precision, repeatability, robustness, LOD and LOQ as per ICH guidelines. The proposed method was used for routine analysis of Serraline in Bulk Drug and Solid Dosage form.

Keywords: Sertraline; antidepressant agent; method development; method validation; UV-Spectrophotometer; RP-UHPLC

Citation: Chaudhari, V.; Patil, S.; Patil, S.; Pawar, S. Development and Validation of RP-UHPLC Method for Determination of Sertraline in Bulk Drug and Dosage Form. *Chem. Proc.* **2022**, *4*, x. https://doi.org/10.3390/xxxxx

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1. Introduction

Ultra-high performance liquid-chromatography (UHPLC) covers liquid chromatography separations implementing columns enclose particles smaller than the 2.5–5 µm sizes typically used in high-performance liquid chromatography (HPLC) [1]. UHPLC work on the same assumption as that of HPLC and of which governing principle is that, as column packing particle size decrease, efficiency and thus resolution increases. Separation using column contains smaller particles display enhance efficiency per unit time. High strength silica (HSS) is another type of column used in UHPLC. In UHPLC, high pore volume UHPLC particles do not acquire the mechanical stability necessary to hold up the high pressure innate of UHPLC separations. For that, there is established a novel silica particle and appropriate morphology required to give long and lifetime efficiency UHPLC column at high pressure likely 1000 bars [2].

Analytical methods development and validation are the continuous and inter-dependent task associated with the research and development, quality control and quality assurance department. Analytical method development is the process of selecting an accurate assay procedure to determine the composition of formulation [3].

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A Phytochemical and Pharmacological Review of an Indian Plant: *Cissus quadrangularis* †

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† Presented at the 2nd International Electronic Conference on Biomedicines, 1–31 March 2023; Available online: https://ecb2023.sciforum.net/.

Abstract: *Cissus quadrangularis* (Vitaceae) is a common perennial succulent climber plant belonging to the Vitaceae family. The plant has a strong pharmacological profile with a variety of phytoconstituents and is geographically distributed throughout tropical and subtropical regions of the world. It is prominently found in India, Pakistan, and Bangladesh. The plant is found all over India, but its presence is dominantly observed in states such as Assam, Kerala, Odisha, Madhya Pradesh, Tamil Nadu, and Uttar Pradesh. The plant in India is popularly called 'Hadjod' or 'Asthisamharaka' and is very well established as a medicine related to the management of bone, muscles, and ligament issues. Traditionally, almost all aerial and underground parts have medicinal value, but the stem is most commonly used. Phytochemicals studies performed on the plant revealed the presence of a variety of constituents, viz., tannins, proteins, carbohydrates, phenol flavonoids, triterpenoids, phytosterols, glycosides, saponins, vitamin C, and alkaloids. In addition, these plants are also a rich source of calcium. The systematic review also established the pharmacological role of the plant as a bone setter and fractured bone healer; its antimicrobial, anti-diabetic, anti-inflammatory, anti-obesity, and anti-oxidant effects; bone turnover; cardiovascular and hepatoprotective properties; and many more. The current review article carried out a detailed discussion of its phytochemical and pharmacological potential.

Keywords: fracture healing; Cissus; wound healing; analgesic; anti-inflammatory

Citation: Hamid, H.S.; Patil, S. A Phytochemical and Pharmacological Review of an Indian Plant: *Cissus quadrangularis*. *Med. Sci. Forum* **2023**, *21*, 20. https://doi.org/10.3390/ECB2023-14557

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1. Introduction

India is a country full of fauna and flora and holds a strong tradition of using flora and fauna as food supplements and medicines. As per the available data, it was estimated that the total number of higher plant species found on earth is 250,000, and of this number, approximately more than 70,000 plants are medicinal. In India alone, over 45,000 plant species exist, making India the world's 12th biodiversity center [1,2]. In addition to this rich fauna and flora, the very existence of an alternative system of medicines, namely Siddha, Ayurveda, Unani, Naturopathy, and homeopathy, in India officially established a very long, safe, and continuous use of herbs [3,4]. As of now, by carrying out a systematic literature study, it was evident that India presented about 8000 medicinal plant species from different alternative systems of medicine. In terms of numbers, around 700 medicinal plant species are reported from Ayurveda, 600 species are reported from Sidhha, 600 species of plants are reported from Amchi, 700 medicinal plant species are reported from Unani, 67 medicinal plant species are reported from Rigveda, 81 medicinal plant species are reported from Yajurveda [1,2], etc. Apart from the prescription drugs of alternative systems, plants are popularly used by millions of Indians as health food, spices, home remedies, and over-the-counter (OTC) drugs. The market for medicinal plants in India stood at INR 4.2 billion

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Salvia hispanica L. seeds: A rare medicinal herb and potential pharmaceutical additive

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Abstract: Salvia hispanica is a plant widespread to Central America. Chia is the common name for it. The seeds obtained from the current plant are most usually used. As public health awareness grows around the world, so does the need for functional foods with many health advantages. Salvia hispanica is a plant widespread to Central America. Chia is the common name for it. The seeds obtained from the current plant are most usually used. As public health awareness grows around the world, so does the need for functional foods with many health advantages. They are also known as "health food" due to their strong nutritional and therapeutic properties. When the seeds are soaked in a suitable solvent, such as water, they exude a sticky gel-like substance that can be employed as an excipient in both culinary and pharmaceutical compositions. This paper will go over all of the therapeutic benefits of the present plant and its parts, as well as the plant's use as an ingredient in foods and pharmaceuticals.

Keywords: *Salvia hispanica;* Chia; Medicinal uses; Additive; Pharmaceutical

Citation: Dhankani, A.R.; Patil, S.A. *Salvia hispanica L.* seeds: A rare medicinal herb and potential pharmaceutical additive. 2023, *volume number*, x. https://doi.org/10.3390/xxxxx
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1. Introduction

Chia is the common name for several Salvia species, the most notable of which being *Salvia columbari-ae*, *Salvia hispanica*, and *Salvia polystachya*. Carolus Linnaeus (1707-1778) discovered *S. hispanica* growing wild in the new world and mistook it for a native plant from Spain.Chia, on the other hand, is native to Mexico and was introduced to Spain after Hernán Cortés resided there. Chia (*S. hispanica* L.) is a seed with unique significance in Latin America, owing to the fact that it has been consumed by Mesoamerican people since ancient times, and the term chia is credited to these people.This has been thoroughly chronicled by historians, Spaniard colonisers, and by local themselves[1]. Chia (*Salvia hispanica* L.) is a tiny seed produced by the annual herbaceous plant *Salvia hispanica* L. Because of its great nutritional and therapeutic values, Chia seeds have gained in popularity in recent years.Chia was grown by Mesopotamian tribes before disappearing for decades until it was rediscovered in the mid-twentieth century. Chia seeds are high in omega-3 fatty acids, polyunsaturated fatty acids, fibre, protein, vitamins, and minerals. Aside from that, the seeds are high in polyphenols and antioxidants such as caffeicacid, rosmarinic acid, myricetin, quercetin, and others. Chia has now been studied in a variety of disciplines. Chia seed advantages have been studied in the medical, pharmaceutical, and food industries all around the world.Chia oil is becoming one of the market's most valued oils. The oil has been produced using several extraction processes[2]. Salvia hispanica L. was given the common name chia by the indigenous South American peoples of the pre-Columbian and Aztec civilizations because of its medical properties. It has been highly recommended as an alternative crop for the field crop business due to its ability to flourish in arid environments[3].

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A COMPREHENSIVE REVIEW ON A MARVEL FRUIT OF *ANNONA MURICATA*

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Abstract: The purpose of this review is to delve into the essence of Annona muricata Linn. A. muricata, also known as soursop, guanabana, and graviola, is a member of the Annonaceae family and has a long history of traditional uses. This is an evergreen plant that grows in tropical and subtropical regions of the world, primarily in Africa, South America, and Southeast Asia. The A. muricata plant's miraculous nature is a boon to mankind, and it has been widely used in folk medicine. A. muricata preparations on the market include candies, syrups, beverages, ice creams, and shakes. Several studies have concluded that the plant contains over 212 chemical constituents such as acetogenins, alkaloids, and phenols. The plant has antibacterial, antiviral, antifungal, antitumor, anthelminthic, analgesic, antiarthritic, hypotensive, anti-inflammatory, immune enhancing effects, and anti-diabetic activity. Although some toxicities have been reported, the extract of A. muricata has been found to be effective and safe. This review attempts to bring together the majority of the available information on A. muricata phytochemistry, traditional uses, biological activities, and toxicity.

Keywords: Annona muricata; Annonaceae; Annonaceous acetogenins; Cytotoxicity; Neurotoxicity

Citation: Patil, H.V.; Dhankani, M.A. A COMPREHENSIVE REVIEW ON A MARVEL FRUIT OF *ANNONA MURICATA*. **2023**, *3*, x. https://doi.org/10.3390/xxxxx
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1. Introduction

Natural products, particularly those derived from plants, have been used to help mankind maintain its health since the dawn of medicine. Over the last century, plant phytochemicals have been an important pipeline for pharmaceutical discovery. The value of active ingredients. The use of plants in agriculture and medicine has piqued scientists' interest. [1]

According to the World Health Organization (WHO), more than 80% of the world's population relies on traditional medicines to meet their primary health care needs6. The primary characteristics were medicinal plant chemical substances that exerted a physiologic action on the human body. The most important plant bioactive compounds were thought to be alkaloids, flavonoids, tannins, and phenolic compounds. The plant chemical Phytochemical Ethno-pharmacologicaffective approach to discovering new anti-infective agents from higher plants. [2]

Intensive chemical studies of this species' leaves and seeds have resulted in the isolation of a large number of acetogenins. Some of the isolated compounds exhibit interesting biological or pharmacological activities, such as antitumoral, cytotoxic, antiparasitic, and pesticidal properties. Because of their anti-parasitic and pesticidal properties, the roots of these species are used in traditional medicine.[3]

The extract of A. Suricata's fruits, seeds, bark, roots, and pericarp contain over 212 phytochemical varieties that are used to treat a variety of ailments. 5 According to his-

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A Systematic Review: Ayurvedic Herbal Medicine for Women with Polycystic Ovary Syndrome †

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† Presented at the 2nd International Electronic Conference on Biomedicines, 1–31 March 2023; Available online: https://ecb2023.sciforum.net/.

Abstract: The endocrine disorder polycystic ovarian syndrome (PCOS) is complicated. In India, two out of every ten women have PCOS. PCOS can also be identified with a polycystic ovary morphology and an ovulatory hyperandrogenism. PCOS, defined as one of the most common female endocrine diseases, affects about 20–25% of women of reproductive age, and is thought to be one of the primary causes of female infertility. Metabolic abnormalities, irregular periods, hypertension, and increased insulin levels are more prone to occur in women with PCOS. In addition, there are more sub-follicular cysts and increased androgen production, including testosterone from the ovaries. Low vitamin levels in PCOS women place them at a high risk for developing severe COVID-19, a risk that may be increased by limited sun exposure brought on by COVID-19 quarantine measures. Therefore, there is a greater need for the public awareness of PCOS. PCOS is a treatable illness that can be treated with safe and effective natural remedies, including the use of various herbs and seeds. To decrease the cost, length, and side effects of current treatments, polyherbal formulations must be developed based on the aforementioned variables. By altering a woman's diet, exercise, doing yoga asanas, and altering her lifestyle, PCOS can be controlled. An effort has been made to review the utilization of natural remedies for PCOS treatment.

Keywords: PCOS; hyperandrogenism; herbs; seeds; yoga asanas

Citation: Dhankani, M.A.; Patil, H.J.; Dhankani, A.R. A Systematic Review: Ayurvedic Herbal Medicine for Women with Polycystic Ovary Syndrome. *Med. Sci. Forum* **2023**, *21*, 46. https://doi.org/10.3390/ECB2023-14362

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1. Introduction

According to the WHO (World Health Organization), 116 million women worldwide, or approximately 3.4 percent, have PCOS [1]. Polycystic ovarian syndrome (6.5–6.7%) is the most common endocrinopathy condition diagnosed in premenopausal women. Polycystic ovarian syndrome, first identified by Stein and Leventhal in 1935, is linked to chronic oligoanovulation, polycystic ovarian morphology, as well as psychological and metabolic abnormalities [2]. Acne, alopecia, hirsutism, obesity, and other related illnesses are frequently observed in women with PCOS due to the high levels of androgens present in their bodies [3] Furthermore, prior studies in this area have shown that PCOS causes numerous physiological alterations in women's ovaries. According to American studies, 15% of women have type 2 diabetes mellitus (type 2 DM) and cardiovascular disease, which over time contributed to the emergence of PCOS symptoms throughout their reproductive years. [4]. According to twin and genomic research, PCOS, especially hyperandrogenism, is highly heritable. The most trustworthy PCOS gene candidate is a member of the TGF-ß superfamily that codes for the extracellular matrix protein fibrillin 3, which is the most reliable PCOS gene candidate [5]. Traditional herbal remedies are receiving a lot of attention in discussions regarding global health. Promotional, preventative, curative, and rehabilitative roles for traditional medicine have been established [6–8]. The advantage of herbal therapy over conventional therapy is that it is safer with fewer side effects, and

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Phytochemistry of *Uvaria narum*: A Multifaceted Perspective and Ethnopharmacological Potential †

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Abstract: The Blooming ethnomedicinal plant *Uvaria narum* (Dunal) Wall is mostly found in the deep forests of the Western Ghats and belongs to the Annonaceae family. *Uvaria narum* is a spreading, pubescent shrub with large, dark bluish-green leaves. Phytochemistry and pharmacognostic studies have revealed that the plant possesses variety of phytochemicals that are remarkable and beneficial to humans. The Plant possesses a number of beneficial properties, such as antioxidant activity exhibited by the presence of Polyphenols and tannins, antifungal activity brought on by the benzoic acid moiety, and tumor-fighting abilities contributed by terpenoid and alkaloids. The presence of phytoconsituents in plants has been attributed to various medicinal properties in plants like anticancer activities. The plant may also be considered against ageing and other diseases caused by free radicals. In vitro cytotoxicity is due to terpenoid, phytosterols, and flavonoids, whereas the liver is protected by flavonoids. The chemical profile of plant shows that Acetogenins including Stereoisomers are important constituents of the root bark. Eczema, itching, varicose veins, haemorrhoids, jaundice, inflammation, and fever are the main ailments for which this herb is used.

Keywords: *Uvaria narum*; benzoic acid; terpenoid; acetogenins; tumor-fighting

Citation: Patil, J.; Tatiya, A.; Wadekar, R.; Girase, T.; Patel, K. Phytochemistry of *Uvaria narum*: A Multifaceted Perspective and Ethnopharmacological Potential. *Chem. Proc.* **2022**, *4*, x. https://doi.org/10.3390/xxxxx

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1. Introduction

India, which is aptly known as the Botanical Garden of the World, is the country that produces the most medicinal plants. Several medicinal herbs have been used by the indigenous system of medicine for thousands of years. India has a valuable heritage of herbal remedies for various ailments [1]. About 120 genera and more than 2000 species make up the enormous plant family known as the Annonaceae. It is a highly uniform family in terms of habitat and anatomy. This family is valuable economically because it produces edible fruits and oils [2]. Approximately 210 species of the Annonaceae have been identified, and they are widely distributed in tropical and subtropical wet forests in Africa, Madagascar, continental Asia, Malaysia, northern Australia, and Melanesia. Some Uvaria species are known to possess biologically valuable compounds, which have a number of therapeutic characteristics, and are often evergreen [3]. Uvaria is a genus of flowering plants in the soursop family, Annonaceae. Because several species in this genus produce edible fruits that resemble grapes, the name Uvaria is derived from the Latin word uva, which means grape. These are spectacular bushes with sparsely haired branchlets. It has huge, woody stems and is a climbing shrub. Uvaria is a sizable straggling shrub

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Medicinal Traits of the Phenolic Compound from *Foeniculum vulgare* for Oligomenorrhea †

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Abstract: A phenolic compound in *Foeniculum vulgare* can improve human health. *Foeniculum vulgar* contains flavonoids, glycosides, and other constituents that are used for medicinal ailments. Trans-anethole, fenchone, and estragole essential oils are the main ingredients in *F. vulgare* seeds. The principle component of fennel oil, Anethole is having structural similarity with the synthetic oestrogen diethylstilboestrol which makes it an active estrogenic agent. Women with PCOS may exhibit obesity, amenorrhea, oligomenorrhea, infertility, or androgenic feature, which are characterized by the absence of ovulation and hyperandrogenism. Oligomenorrhea is a kind of irregular menstruation periods. Treatment of oligomenorrhea depends on the causes; the main cause of oligomenorrhea is polycystic ovarian syndrome (PCOS) present with 75%-85% experiencing infrequent periods. The mini-review focuses on *F. vulgare* seeds as an advantageous addition to treat PCOS. Women with PCOS also have a lower level of hormone progesterone due to the absence or reduction in ovulation. Numerous phytoestrogen can be found in *F. vulgare* seeds, with less insulin resistance and lowerblood sugar level, fennel phytoestrogen content is beneficial. It is also thought to aid in reducing the cellular imbalance that causes PCOS's metabolic abnormalities.

Keywords: *Foeniculum vulgare* ; Phytoestrogen; anethole; Oligomenorrhea; polycystic ovarian syndrome

Citation: Patil, J.; Patil, D.; Sayyed, H.; Patil, M.; Mali, R. Medicinal traits of the phenolic compound from *Foeniculum vulgare* for Oligomenorrhea *Chem. Proc.* **2022**, *4*, x. https://doi.org/10.3390/xxxxx

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1. Introduction

Fennel, also known as *Foeniculum vulgare* (FVE), is a popular medicinal herb that is indigenous to the Mediterranean region. It is grown in various parts of Europe and Asia, and much of it is imported from countries like Egypt, China, and India [1].The biennial Apiaceae family member *Foeniculum vulgare* is a medicinal and aromatic fruit (Umbelliferaceae). With bright yellow flowers and delicately textured leaves, it is a hardy perennial plant having hollow stems that allow it to grow to a height of up to 2.5 m. The final section of each leaf is filiform (like a thread) and about 0.5 mm wide. Leaves grow to a height of 40 cm. Compound umbels are the structures that form flower terminals. Dry seeds that are 4–10 mm long make up the fruit [2]. FVE fruit has a long history of use as a food and medicinal. It has long been held that the plant increases the production of breast milk and functions as a carminative, which helps manage flatulence. Additionally, this herb has been said to increase libido, stimulate menstrual flow, lessen symptoms of the male climate, expedite delivery, ease indigestion, and relieve coughing [3].

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Clomiphene Citrate as Nanomedicine Assistance in Ovulatory Disorders and Its Hyphenated Techniques †

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Abstract: Nanotechnology has prompted new aspirations for managing modern human challenges. Furthermore, it has been utilized for aid in the prevention, diagnosis, and treatment of ovulatory disorders. Women with ovulatory issues may benefit from formulations using nanotechnology as an alternative possible treatment. Clomiphene citrate is a nonsteroidal, ovulatory stimulant that acts as a selective estrogen receptor modulator (SERM). It is a triphenyl ethylene stilbene derivative that is primarily used to trigger ovulation in female infertility cases where there is anovulation. Anovulatory infertility is most frequently caused by polycystic ovarian syndrome (PCOS), which is a gynecological endocrine disorder. Elevated serum concentrations of androgens, LH, and insulin are the main features of its endocrine profile. The primary goal of treating PCOS-related infertility is to increase the amount of FSH that is exposed to the ovary, either by antagonizing the estrogenic effects of clomiphene citrate in the hypothalamus or by directly affecting the ovary using recombinant follicle-stimulating hormone (FSH). In about 80% of treated individuals, ovulation is recovered by clomiphene citrate. In this review, we discuss the chemistry and pharmacology of clomiphene citrate, as well as the delivery of clomiphene citrate via nanosystems for improving solubility and limiting side-effects. The hyphenated techniques for analyzing and quantifying clomiphene citrate in solvents and biological samples are also overviewed.

Keywords: clomiphene citrate; nanomedicine; ovulatory disorder; PCOS; hyphenated techniques

Citation: Girase, T.; Patil, J.; Tatiya, A.; Patil, D.; Patil, M. Clomiphene Citrate as Nanomedicine Assistance in Ovulatory Disorders and Its Hyphenated Techniques. *Mater. Proc.* **2023**, *14*, 6. https://doi.org/10.3390/IOCN2023-14505

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1. Introduction

Ovulatory disorders are a spectrum of conditions that have an impact on a woman's endocrine system and are a major contributor to female infertility. Polycystic ovary syndrome (PCOS) is a hormonal issue that affects women during their reproductive years [1]. Stein and Leventhal are generally acknowledged as the first researchers of polycystic ovarian syndrome; however, in 1721, Vallisneri, an Italian scientist, reported a married, infertile woman with shiny, white-surfaced ovaries the size of pigeon eggs. Formal diagnosis criteria were not offered or generally used until a PCOS meeting sponsored by the National Institutes of Health (NIH) in the early 1990s [2].

The compound currently known as clomiphene citrate was discovered in 1956 by Frank Palopoli and his colleagues in the Merell Chemistry Department at the time. The initial outcomes of clomiphene's human clinical trials—at the time known as MRL-41—were published by Greenblatt et al. (1961) in the Journal of the American Medical Association (JAMA) in October 1961. It was the third drug to be submitted to the United States Food and Drug Administration (USFDA) for review in accordance with the regulations. In 1965,

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An Overview on Management of Psoriasis Using Calcipotriene and Its Amalgamation as Nano Based Drug Delivery System †

Aayushi Tatiya [1,*], Javesh Patil [2,*], Tejasweeni Girase [1], Mamta Patil [1] and Kiran Patel [1]

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† Presented at the 4th International Online Conference on Nanomaterials, 5–19 May 2023; Available online: https://iocn2023.sciforum.net/.

Abstract: A skin ailment known as psoriasis, which affects 2–5% of people worldwide, is characterised by excessive keratinocyte proliferation and abnormal differentiation. Calcipotriene, a synthetic vitamin D analogue, is the first-line treatment for psoriasis. It may be used in combination with methotrexate, tazarotene, acitretin, cyclosporine, and corticosteroids. It reduces the number of T cells and regulates the inflammatory response in psoriatic lesions. However, the effectiveness of pharmacotherapy based on conventional formulations for treating patients is only partially favourable. Recent developments in nanotechnology-based nanomedicines may allow us to improve the efficacy and safety of pharmacotherapeutic treatments for psoriasis. Enhancing therapeutic efficacy while lowering toxicity through overall dose reduction are two spectacular effects of using nanomedicine as a medication carrier. This novel method efficiently ensures the site-specific administration of medications throughout the skin to treat psoriatic lesions. The present manuscript aims to discuss the chemistry and pharmacology of calcipotriene, conventional pharmacotherapy and contemporary research on calcipotriene, and the combinations of it that are used as nanomedicines for the better management of psoriasis. This review primarily focuses on the nanoemulsion loaded gel of calcipotriene and clobitasol propionate as it offers high drug loading and retention in the skin, improving the local concentration of both drugs and reducing their systemic side effects. Calcipotriene and methotrexate combined in a nanostructured lipid carrier are also the most recent generation of solid lipid nanoparticles, with better drug loading, controlled release, and enhanced bioavailability.

Keywords: psoriasis; calcipotriene; nanomedicine; therapeutic; nanoemulsion

Citation: Tatiya, A.; Patil, J.; Girase, T.; Patil, M.; Patel, K. An Overview on Management of Psoriasis Using Calcipotriene and Its Amalgamation as Nano Based Drug Delivery System. *Mater. Proc.* **2023**, *14*, 38. https://doi.org/10.3390/IOCN2023-14504

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1. Introduction

Psoriasis is a chronic autoimmune inflammatory disease, affecting 2–5% of the world's population, and is characterized by macules and plaques on the skin due to hyperproliferation and abnormal keratinocyte differentiation [1,2]. The primary clinical sign of psoriasis is an erythematous and scaly skin lesion, which is generally located in the joints (elbows, knees) and scalp, but any localization is possible. The pathogenesis of this illness reveals three key characteristics: vascular alterations, keratinocyte proliferation, and aberrant differentiation, Inflammatory cells infiltrate the skin and produce cytokines [3]. Psoriasis patients have higher rates of obesity, cardiovascular disease, non-alcoholic fatty liver disease, diabetes, and metabolic syndrome than the general population. These risks are particularly high in patients with more severe psoriasis. Its origin is currently unknown, but it seems to be triggered by a combination of genetic (family history) and environmental factors (alcohol, tobacco, infections, medications, stress). Psoriasis can be categorised into

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The Surging Function of Nanotechnology in the Management of Primary Biliary Cholangitis with Obeticholic Acid †

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† Presented at the 4th International Online Conference on Nanomaterials, 5–19 May 2023; Available online: https://iocn2023.sciforum.net/.

Abstract: Obeticholic acid (OCA), also known as 6alpha-ethyl-3alpha,7alpha-dihydroxy-5-cholon-24-oic acid, is a semi-synthetic derivative of chenodeoxycholic acid (CDCA, 3alpha,7alpha, dihydroxy-5-cholon-24-oic acid), a primary bile acid that is produced in the liver from cholesterol and is comparatively hydrophobic. OCA, a farnesoid X receptor (FXR) agonist, is crucial for the enterohepatic movement of bile acid. OCA has significantly improved biochemical outcomes in preliminary tests in individuals with primary biliary cholangitis (PBC). PBC is an autoimmune disease of the liver characterised by cirrhosis, cholestasis, fibrosis, and destruction and inflammation of the intrahepatic bile ducts; the autoimmune reaction is mostly responsible for this. In order to reduce inflammation, OCA targets the physiological and immunological functions of PBC. Drugs are used in immunological therapy, targeting specific cytokines and chemokines associated with inflammation, as well as immunological molecules involved in B cell and T cell responses. We concentrate on numerous nanotechnology therapeutic modalities for liver illness in this review. Nanomedicine provides a novel strategy that focuses on tolerance induction rather than immunosuppression, offering significant promise for the treatment of autoimmune illnesses. Immune-modifying drugs can be incorporated into tolerogenic nanoparticles to safely and effectively target the antigen-specific immune response in autoimmune disorders. Given the anatomical characteristics and immunological uniqueness of PBC, these may be particularly effective.

Keywords: obeticholic acid; primary biliary cholangitis; autoimmune diseases; nanotechnology; nanomedicine

Citation: Patil, D.; Patil, J.; Patil, M.; Girase, T.; Patel, K. The Surging Function of Nanotechnology in the Management of Primary Biliary Cholangitis with Obeticholic Acid. *Mater. Proc.* **2023**, *14*, 39. https://doi.org/10.3390/IOCN2023-14506

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1. Introduction

Primary biliary cholangitis (PBC) is a chronic autoimmune illness that preferentially affects the interlobular bile channels (cholangitis), causing cholestasis, the retention of bile salts in the liver, and secondary hepatocyte damage. Although the disease can proceed to cirrhosis, liver failure, and death, the onset is frequently silent and sneaky [1]. It is a chronic, autoimmune, slowly progressing liver condition that primarily affects middle-aged women at a ratio of about 10:1 [2]. It has been discovered that genes associated with X-linked immunodeficiencies can cause granuloma formation and elevated immunoglobulin (Ig) M levels, which are frequent observations in PBC. X chromosome monosomy is observed in women with PBC, but the cause of this gender difference is not fully understood [3].

The onset of cirrhosis and its complications, however, play a significant role in the disease's outlook. All patients should begin and continue receiving ursodeoxycholic acid because it is linked to a better prognosis. The clinical outcome of ursodeoxycholic acid is correlated with the biochemical reaction, but patients with incomplete responses still

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Nanoparticles: A Novel Antifungal Drug Delivery System †

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Abstract: Innovative drug delivery systems show how pharmaceuticals are administered to the site of action in order to produce the therapeutic effect. Fungal infections are a problem today on a global scale. There is no medical cover-up in the world regarding the significance of fungi as a human pathogen. According to recent developments, the accurate diagnosis and treatment of these infections are crucial and required. Numerous factors influence the development of modern pharmaceutical products and their methods of administration. For the development of a successful novel antifungal drug delivery system, it is essential to thoroughly investigate the relationships between the formulations, the mode of administration, pharmacological properties, pharmacokinetics, pharmacodynamics, stability, efficacy, safety, and clinical indications. This review article discusses various types of nano techniques used in the delivery of antifungal drugs, including dendrimers, polymeric nanoparticles, inorganic nanoparticles, and nanoparticles based on phospholipids (nano-vesicles). Due to their unique properties, nanoparticles can exert more inhibitory power through lower concentrations than conventional dosages when used in the treatment of fungal infections. Reduced drug efficacy, limited penetration through tissue, poor aqueous solubility, decreased bioavailability, and poor drug pharmacokinetics are among the drawbacks to using antifungal medications in delivery systems. Therefore, the incorporation of antifungal medications through the nanoparticles' drug delivery systems can reduce these undesirable properties.

Keywords: novel drug delivery; antifungal; nanoparticles; nano-vesicles

Citation: Mali, R.; Patil, J. Nanoparticles: A Novel Antifungal Drug Delivery System. *Mater. Proc.* **2023**, *14*, 61. https://doi.org/10.3390/IOCN2023-14513

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1. Introduction

Fungal infections are infections that affect the skin and mucous membranes, or cause more severe, invasive, and systemic diseases of the internal organs. Fungal infections can also affect the lungs and heart [1]. People who have a weak or imbalanced immune system are more likely to get airborne fungal infections. Nanoparticle-based alternative therapies have received significant scientific attention in recent years. By adhering to the fungal cell wall and thereby increasing the drug concentration close to fungi, nano-carriers have the potential to enhance the efficacy of antifungals [2]. Systemic mycosis, superficial mycosis, cutaneous mycosis, and subcutaneous mycosis are the four types of these infections. According to researchers, treating these mycoses would not be possible by relying solely on the antifungal compounds that are currently available. A brand-new antifungal drug that works at the target sites needs to go through a long discovery phase, several clinical trials on humans and animals, development, and regulatory approval before it can be sold [3]. Due to their distinct structural and functional characteristics, advanced topical carriers overcome biopharmaceutical issues such as low bioavailability and poor retention that are associated with conventional drug delivery systems. According to the literature,

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Proceeding Paper

Significance of Ziprasidone Nanoparticles in Psychotic Disorders †

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† Presented at the 4th International Online Conference on Nanomaterials, 5–19 May 2023; Available online: https://iocn2023.sciforum.net/.

Abstract: Nanotechnology is used today in a wide range of industries. Weakly water-soluble medications have better solubility and bioavailability when delivered by nano-specific drug delivery methods, such as nanocrystals. Another name for ziprasidone is 5-[2-[4-(1,2-benzisothiazol-3-yl)-1-piperazinyl]ethyl]-6-chloro-1,3-dihydro-2H-indol-2-one, and it is a brand-new "atypical" or "second-generation" antipsychotic drug. Its multipotent G-protein-coupled (GPCR) receptor binding profile is distinctive. It is used to treat bipolar-disorder-related acute manic or mixed episodes as well as schizophrenia. Schizophrenia is a serious mental condition in which a person can experience reality in a strange or different way. Ziprasidone is a highly lipophilic and unstable drug. Ziprasidone nanoparticles, another incarnation of this drug, are used to treat diseases. When ziprasidone is present in the form of particles with an effective average crystal size of less than or equal to 100 nm, the term "nanoparticle" is frequently used to characterize them. A colloidal submicron dispersion of ziprasidone particles is what ziprasidone nanosuspensions and nanoemulsions are made of. One formulation that makes use of solubilization technology is a nanosuspension of a crystalline ziprasidone free base. In order to get around the drug's solubility issue and investigate its potential for nose-to-brain delivery, a buffered nanoemulsion of ziprasidone HCl has been created. We discuss numerous ziprasidone nanoformulations used to treat psychotic illnesses in this review.

Keywords: ziprasidone; schizophrenia; colloidal dispersion; nanosuspension; nanoemulsion

Citation: Patil, M.; Patil, J.; Patil, D.; Patel, K.; Tatiya, A. Significance of Ziprasidone Nanoparticles in Psychotic Disorders. *Mater. Proc.* **2023**, *14*, 62. https://doi.org/10.3390/IOCN2023-14503

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1. Introduction

Today, nanotechnology is a crucial method for making poorly water-soluble pharmaceuticals more soluble. Because of the increase in surface area and saturation caused by the reduction in these medications' particle sizes to the nanometer range, they can dissolve more quickly and have greater bioavailability [1,2]. About 40% of recently developed medicines have poor water solubility [3]. Drugs' poor bioavailability is due to their poor water solubility [4]. To make weakly water-soluble medications more soluble, there are numerous methods such as using cosolvents, surfactants, and complexing to prepare pharmaceuticals as salts [5]. Additionally, it has been claimed that particle size reduction medicines can make them more soluble [6]. Applications of nanotechnology for pharmacists include medications with active components that are nanoscale in size [7]. As a result of the smaller drug delivery systems, drugs can now be deposited in previously inaccessible body parts, which has relevance in the identification and treatment of specific illnesses such as cancer. Target therapy and advancements in medical devices and diagnostic tests are new discoveries in medication delivery [8]. The science underlying nanotechnology is still in its infancy, which raises certain concerns about these advancements.

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Proceeding Paper

Nanomaterials: An Improvised Drug Delivery System through the Gastroretentive Drug Delivery System †

Ravindra Mali [1,*] and Javesh Patil [2,*]

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† Presented at the 4th International Online Conference on Nanomaterials, 5–19 May 2023; Available online: https://iocn2023.sciforum.net.

Abstract: Oral drug administration is among the most popular options in terms of patient compliance. The absorption window's influence enables the majority of commercially available modified-release dosage forms to have the desired physiological impact. In order to achieve the desired activity against the body's challenges, the formulator must keep the dosage form in the stomach, which is the aim of gastroretentive drug delivery (GRDD). In this process of maintaining the gastrointestinal (GI) tract, influenced by the nature of excipients and driven by the type of formulation to achieve therapeutic goals, a GRDD system is comparable to an improvised CDDS (control drug delivery system) before it reaches the absorption site. The most prevalent kind of preferred modified release system in use is solid oral dosage forms. To achieve the desired release profile, fewer doses are required when using these forms. Each drug candidate has a unique GIT absorption window, so there are many challenges. Solvability characteristics, pH-dependent variables, stability, physiological region, etc. Due to the barriers that have been added to this system, many products have been created. This review article contains nanomaterials used in GRDDS as novel drug delivery, factors affecting, and challenges to formulate nanomaterials, evaluation and advance technology used for application of nanomaterials.

Keywords: nanomaterials; GRDDS; control drug delivery; GI tract; advance technology

Citation: Mali, R.; Patil, J. Nanomaterials: An Improvised Drug Delivery System through the Gastroretentive Drug Delivery System. *Mater. Proc.* **2023**, *14*, 63. https://doi.org/10.3390/IOCN2023-14514

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Published: 5 May 2023

1. Introduction

Drug delivery via the oral route is one of the most preferred routes in terms of patient compliance compared to other routes. The absorption window is the influential parameter due to which most commercially available modified-release dosage forms act in this physiological region for their desired effect [1]. The body's gastrointestinal (GI) tract is where most drugs are administered. Simple medication administration for compliance therapy, a broad surface area for systemic absorption, and the adaptability of the GI tract to handle various food types are all advantages. The benefits of the GI tract in medicine distribution include a variety of formulations [2]. This route suffers from a number of physiological issues, including erratic gastric emptying, a short GI transit time (80–12 h), and a drug absorption window in the upper small intestine. Efforts are being made to address these issues, and a novel drug delivery mechanism is required [3].

The gastroretentive drug delivery system (GRDDS) aims to hold the dosage form in the stomach to attain the desired activity by the formulator against the challenges involved with the body [4]. As an improvised CDDS (control drug delivery system), before reaching its site of absorption as compared to conventional drug delivery, the GRDDS comparably prevails in this process of sustaining in the GI tract, influenced by the nature of excipients and driven by the type of formulation to attain therapeutic goals. Solid oral dosage forms

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Proceeding Paper

An Overview of the Applications of Gemfibrozil Nano-Formulation in Hyperlipidemia †

Kiran Patel [1,*], Javesh Patil [2,*], Tejasweeni Girase [1], Aayushi Tatiya [1] and Devyani Patil [1]

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† Presented at the 4th International Online Conference on Nanomaterials, 5–19 May 2023; Available online: https://iocn2023.sciforum.net.

Abstract: Gemfibrozil is a benzene derivative of valeric acid that belongs to the class of medications known as fibrates. Its chemical name is 5-(2,5 dimethylphenoxy)-2,2-dimethylpentanoic acid. It is the treatment of choice in clinical settings for hyperlipidemia (type III) and hypertriglyceridemia (type IV), and it has been shown to reduce serum triglycerides and very low-density lipoprotein cholesterol while increasing high-density lipoprotein cholesterol by activating the peroxisome proliferator-activated receptors (PPARs), acting primarily on the PPARα isoform. Gemfibrozil's effective absorption and bioavailability after oral administration are constrained by its small molecule size, poor water solubility (0.01 mg/mL), and slow rate of digestion. These factors are caused by the drug's physicochemical characteristics. Gemfibrozil's solubility may be increased by creating nano-specific drug delivery methods, such as nanocrystals, nanosuspensions, or lipid-based formulations. In literature, the lipid-based drug delivery system has received substantial coverage for improving drug solubility, permeability, and bioavailability. Self-nano-emulsified delivery systems (SNEDDS), for example, are lipid-based formulations that are supposed to improve lipophilic drug absorption. When gently stirred, SNEDDS, which are isotropic solutions of oil, surfactant, co-surfactant, and medicine, produce an oil-in-water emulsion in an aqueous environment. This review will demonstrate the techniques used to increase the solubility and bioavailability of gemfibrozil.

Keywords: gemfibrozil; poor water solubility; nano-specific drug delivery system; SNEDDS; increase solubility

Citation: Patel, K.; Patil, J.; Girase, T.; Tatiya, A.; Patil, D. An Overview of the Applications of Gemfibrozil Nano-Formulation in Hyperlipidemia. *Mater. Proc.* **2023**, *14*, 45. https://doi.org/10.3390/IOCN2023-14507

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Published: 5 May 2023

1. Introduction

A significant area of current research is nanotechnology, which deals with the design, production, and manipulation of particle structures starting from about 1–100 nm in one dimension. The physical, chemical, and biological characteristics of the nanoparticles in this size range diverge significantly from those of individual atoms and molecules, as well as the comparable bulk materials [1]. Nanoparticles (NPs) are colloidal particles with a diameter of less than one nanometer. The NPs' matrix contains a medication that is either encapsulated, trapped, or attached, as shown in Figure 1. Depending on whether a polymerization reaction is necessary for the synthesis or if it may be performed directly from a pre-existing polymer or macromolecule, there are two main groups of nanoparticle production methods. The type of polymers used and the medicine that will be enclosed influence the production method chosen. Because these tiny particles can shield the drug from enzymatic and hydrolytic degradation in the gastrointestinal tract (GIT), extend the time the drug spends there by adhering to mucous membranes, and significantly

About the Book

The book, "Pharmacognosy, Phytochemistry and Herbal Drug Technology" (As per PCI Regulations)" is written for Diploma and UG students. The importance of study of Pharmacognosy and its scientific applicationsis well acknowledged. This book mainly covers the phytomorphology powder characters, quantitative microscopy and extraction of active constituents of various plant drugs. The book includes PCI New Syllabus for D.Pharm and B.Pharm. Students.

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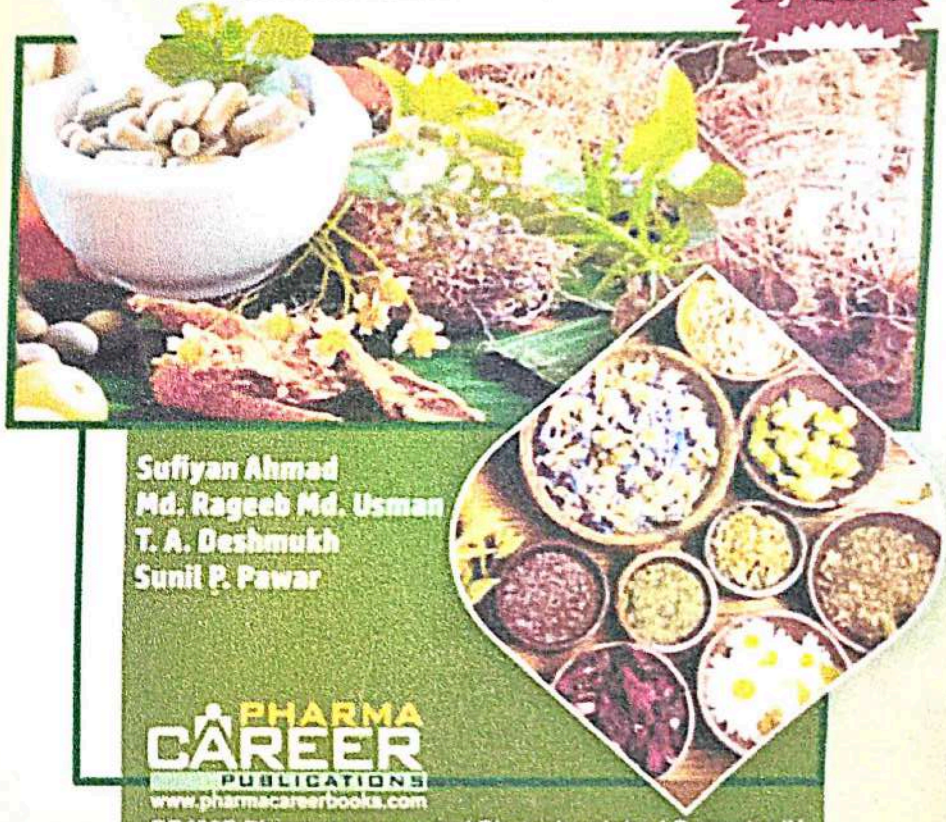

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Multiple Choice Questions in PHYSICAL PHARMACEUTICS

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A Complete Guide to MCQs in Physical Pharmacy and Physical Chemistry

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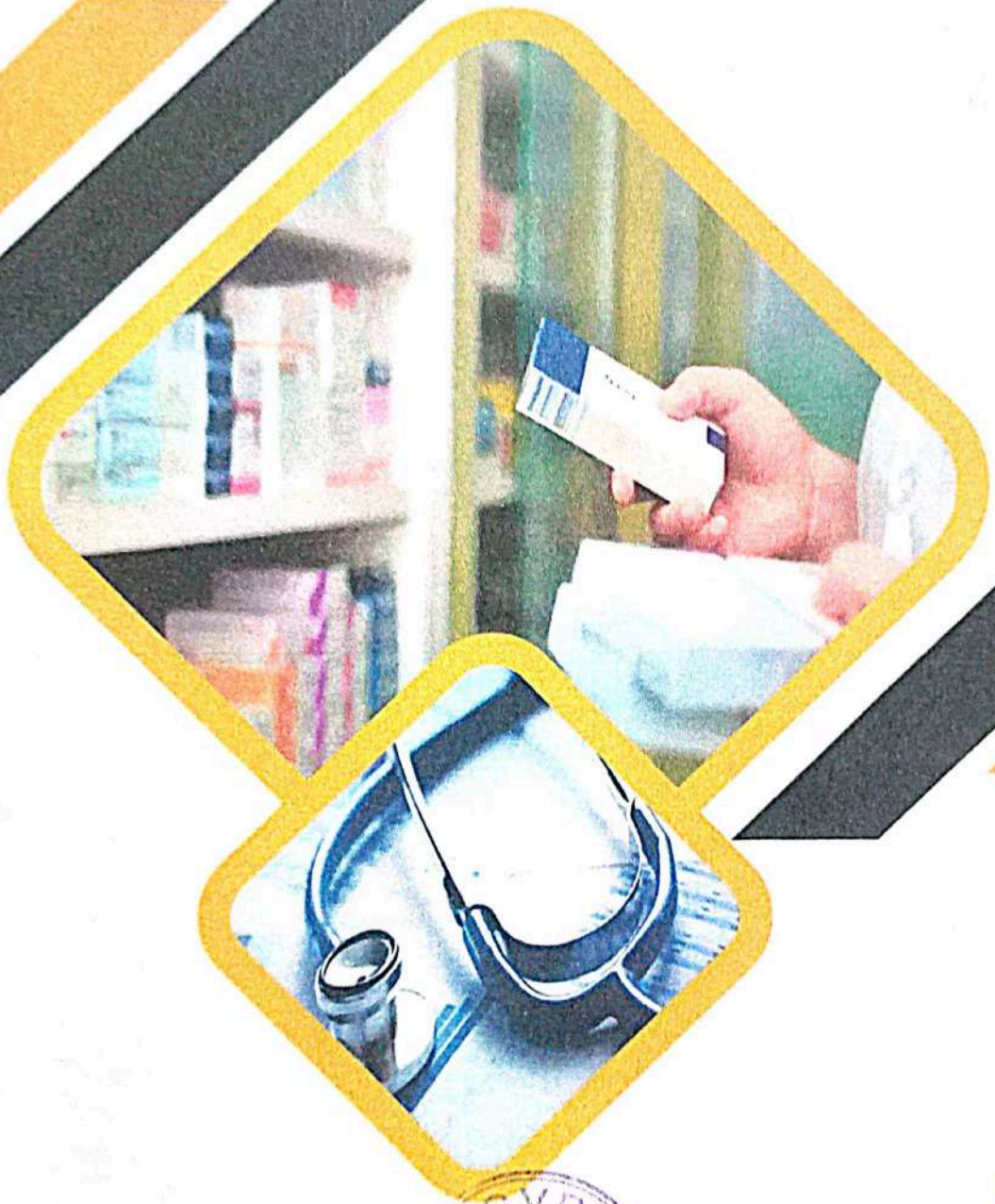

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18. Women's Health Issues

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18.1 Introduction to Women's Health:

Women's lives have changed over the centuries. Life was particularly difficult for most women. Aside from the numerous dangers and diseases, women became wives and mothers often when they were just emerging from their own childhood. Many women had a large number of pregnancies which may or may not have been wanted. In the past, childbirth itself was risky and not infrequently, led to the death of the mother. Most women in the past did not live long enough. It is important that every woman has access to knowledge related to the spectrum of women's health issues, not only about her reproductive system, but about all aspects of her body.

A. Female Reproductive System:

A woman's reproductive system includes her uterus, Fallopian tubes, ovaries, cervix, and external genitalia. The breasts can also be included, even though, technically speaking, they are not part of the reproductive system. The breasts do play a major role in pregnancy and motherhood. primary function of the reproductive system is to conceive and bear children, a female's reproductive system makes a major contribution to her being a woman. Due to the complexity of her reproductive system, she can experience a number of problems ranging from yeast infections of the vagina to fibroids of the uterus or cysts of the ovary. While both men and women contract various conditions, some health issues affect women differently and more commonly. Furthermore, many women's health conditions go undiagnosed and most drug trials do not include female test subjects. Even so, women bear exclusive health concerns, such as breast cancer, cervical cancer, menopause, and pregnancy. Women suffer higher heart attack deaths compared to men. Depression and anxiety exhibit more frequently among female patients. Urinary tract conditions present more often in females, and sexually transmitted diseases can cause more harm to women. Among the conditions that present most frequently in women, the following eight illnesses pose considerable health risks.

B. Heart Disease:

In the United States, heart disease causes one in every four deaths among women. Although the public considers heart disease a common issue among men, the condition affects males and females nearly equally. Yet, only 54 percent of women realize that heart disease is the top health condition threatening their gender.

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