Evaluation of the Effect of Taheri Consciousness Field 1 on Nanostructured Lipid Carriers in the Treatment of UV-irradiated Human Hair Keratin

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ABSTRACT

Self-organizing nanostructured lipid carriers (NLCs) that are nanoemulsions composed of a dispersed phase of a mixture of solid and liquid lipids have been used in drug delivery systems. Research on NLCs has shown that these carriers have advantages for drug treatments over conventional carriers, including increased solubility, stability, and shelf life and improved permeability and bioavailability. Also, self-assembly has attracted much research attention because of its possible role at the beginning of life. Moreover, it is known that solar ultraviolet waves play two contradictory roles in the prebiotic and biotic atmosphere in the process of life initiating: The constructive role in providing primary energy for effective reactions in the formation of organic molecules and the destructive role in breaking of biomolecules formed in the ozone-depleted early atmosphere and full of disturbing waves. Considering the importance of self-organizing structures in the category of life initiation and drug delivery, as well as the significant effects of the Taheri Consciousness Field 1 on the structure and function of enzymes, biomimetic molecules, and biological cells that have been observed in several studies, this research aimed to study effects of Taheri Consciousness Field on UV irradiated human hair keratin. According to the results of the present study, using Faradarmani CF treated synthetic NLCs, a remarkable repair and improvement of UV-irradiated keratin protein have been achieved.

Keywords: lipid nanostructured carriers; UV irradiation; Self-organization; Taheri Consciousness Field; life initiation; Keratin

INTRODUCTION

Nowadays, the use of nanotechnology provides this opportunity to enhance treatments with targeted drug delivery. For example, this application can increase drug flux into and through the skin (Goyal et al., 2016). Nanoparticles are defined as tiny particles with dimensions between 1 and 100 nm (Khan et al., 2019). Solid lipid nanoparticles (SLNs) were conceptualized by Müller and Gasco as a potential delivery particle system in the early 1990s. These nanocarriers (50-1000 nm) offer a great number of advantages, for instance; they have been utilized in various drug deliveries (Yetisgin et al., 2020) and as biocompatible lipids (Lacatusu et al., 2011). Furthermore, minimal use of organic solvents in the formulation and high stability in vivo are other benefits of using SLNs (Uner et al., 2007). However, they have certain limitations such as poor drug loading capacity, unpredictable gelling tendency, and drug leakage (Mishra et al., 2018). Nanostructured lipid carriers (NLCs) also have been introduced after SLNs to overcome the possible shortcomings of SLNs. NLCs are composed of physiological and biocompatible lipids, surfactants, and co-surfactants (Chauhan et al 2020). They provide better stability, loading capacity and prevent the drug expulsion during storage (Naseri et al., 2015).

The main characteristic feature of nanoparticles in a colloidal medium, which indicates their stability in an aqueous medium with a biomedical application, is the zeta potential

(ζ [=] mV) of the particles (Gordillo-Galeano and Mora-Huertas 2021). The zeta potential is often considered as the effective charge on the particle (Hiemenz & Rajagopalan 1997). Particles of the same charge with increasing absolute zeta potential will have less tendency to accumulate and generally, suspension with zeta potential of ζ> | 30 | are considered suspension with good colloidal stability (Freitas & Müller 1998).

Self-organization is a phenomenon that components of a system are assembled by noncovalent forces such as micelles (Förster et al., 2002). Not only does self-organization play a crucial role in building up complex structures but also provides a fundamental process of the emergence of life (Mann, 2012; Li, 2017; Mendes et al., 2013). The origin of life is one of the most important challenges in science. There have been many efforts to solve this problem for nearly 100 years (Oró et al, 1990). In most theories and experiments in this criteria, ultraviolet waves have played a key role in the formation of life (Miller & Urey 1959; Oparin 1965; Lazcano 2010).

Undeniably, water molecules are considered as an essential factor at the origins of life. They have been described with their ambivalent role. It means that, in addition to acting as solvent and reactant, they also enhance hydrolysis which is a powerful force for enhancing self-organization in prebiotic chemistry (do Nascimento Vieira et al., 2020). Considering the destructive role of UV in breaking the primary bonds of organic molecules in early life, water has been suggested as a possible candidate for protection against these effects (Stamnes, 2003). It should be noted that, in addition to the biochemistry study of life, we need to understand the physical processes and driving forces to know how matter transition occurred from the nonliving to the living state (Cronin and Walker, 2016; Goldenfeld and Woese 2011). Life cannot be explained by our current laws of physics and the new physics needed to probe the origins of life (Walker, 2019).

The nature of consciousness and its place in science has received much attention in the current century. Many philosophical and scientific theories have been proposed in this area. In the1980s, Mohammad Ali Taheri introduced novel fields with a non-material/non-energetic nature named Taheri Consciousness Fields (TCFs). In this perspective, T-Consciousness is one of the three existing elements of the universe apart from matter and energy. According to this theory, there are various TCFs with different functions, which are the sub-

categories of a networked universal internet called the Cosmic Consciousness Network (CCN). The major difference between the theory of TCFs and other theoretical concepts about consciousness is related to the practical application of the TCFs. These fields can be applied to all living and non-living creatures, including plants, animals, microorganisms, materials, etc.

Mohammad Ali Taheri, the founder of Erfan Keyhani Halqeh, a school of thought, introduced a new science in 2020 as a branch of this school. He coined the term Sciencefact for this new science because it utilizes scientific investigations to prove the existence of T-Consciousness as an irrefutable phenomenon and a fact. Although science focuses solely on the study of matter and energy and Sciencefact, by contrast, explores the effects of the [non-material/non-energetic] TCFs, Sciencefact has provided a common ground between the two by conducting reproducible laboratory experiments in various scientific fields, and it has used the scientific approach in proving TCFs.

The influence of the TCFs begins with the Connection between CCN as the Whole Taheri Consciousness of the universe and the subjects of study as a part. This Connection called "Ettesal" is established by a Faradarmangar's mind (a certified and trained individual who has been entrusted with the TCFs). The human mind has an intermediary role (Announcer) which plays a part by fleeting attention to the subject of study and then the main achievement obtained as a result of the effects of the TCFs. These fields cannot be directly measured by science, but it is possible to investigate their effects on various subjects through reproducible laboratory experiments (Taheri 2013).

The research methodology in the study of T-Consciousness has been founded on the process of Assumption, Argument, and Proof, in which the basic Assumption is: The Cosmos was formed by a third element called T-Consciousness that is different from matter and energy.

The Argument: The existence of TCFs can be demonstrated by their effects on matter and energy (e.g., humans, animals, plants, microorganisms, cells, materials, etc.)

The Proof is the scientific verification of the effects of TCFs on matter and energy (according to the Argument) through various reproducible scientific experiments.

Accordingly, to investigate and verify the existence, effects and mechanisms of TCFs, the following five research phases (Phases 0 through 4), and the aims of each phase are outlined below.

Phase-0 studies aim to prove the existence of TCFs by observing their effects. The nature of T-Consciousness and what it is will not be addressed in this phase. Phase-1 explores the varied effects of different TCFs. Phase-2 examines the reason behind the varied effects of these fields. Phase-3 investigates the mechanism of TCFs effects on matter and energy. Finally, Phase-4 draws significant conclusions, particularly with regard to the mind and memory of matter and their relation to the T-Consciousness, etc.

In order to study the possible effects of one of TCFs, named TCF1 or Faradarmani CF, at the beginning of life, the effects of this novel field on the structure and function of Horseradish Peroxidase (HRP), gold nanozyme, and biomimetic micellar supramolecular models were investigated previously (Taheri et al, 2021j; Taheri et al, 2021k) and the results revealed both structural and functional changes as a result of the TCF1 treatment. Moreover, the alleviative effects of TCF1 on Triticum aestivum under salinity stress (Torabi et al, 2020), memory impairment (Taheri et al, 2021b), and brain injury trauma (Taheri et al, 2021c) in mice, have been previously studied.

Keratin as a structural protein is rich in amino acid cysteine which is covalently linked via disulfide bonds with crosslinks between strands that make it one of the strongest non-mineralized tissues in nature (Zhang et al, 2013). In the present study, self-organized structured NLC has been utilized with two objectives: first, the role of the TCF1 in repairing the damage caused by ultraviolet radiation in the Earth's primary atmosphere and second, its possible

role in the optimal organization of early life forms. Also, the alleviative effect of TCF1 on UV-irradiated hair keratin has been investigated.

MATERIALS AND METHODS

TCFs Application

TCF1 was applied to the samples according to the protocols regulated by the COSMOintel research center (www.COS-MOintel.com). A request for Connection to the CCN to uti-lize TCFs can be placed through the COSMOintel website in the "Assign Announcement" section. This access is available for everyone at no cost. To study and experience this Connec-tion, the researchers can register on the website at any time and report the experiment to the COSMOintel research cen-ter. Certain details of the experiment must be provided to the center; for example, the characteristics or number and name of samples and controls must be specified. The entire experiment was carried out as a double-blind method where lab technicians were completely unaware of TCFs theory, and the Faradarmangar at the COSMOintel research center who established the Connection was unaware of the details of the study. Double-blind is a gold standard that is common in science experiments in the field of medicine and psychology, involving theoretical and practical testing.

NLC Synthesis

It was done by emulsion and homogenization by ultrasound. First, the oil phase (consisting of solid lipid and liquid lipid) was heated to the specified melting point in a water bath up to 5 °C above the melting point of lipid (75 °C). Then the aqueous phase (surfactant twin 80 and deionized water) with a tem-perature of 75 °C, was added dropwise by syringe pump into the lipid phase at the temperature of 75 °C and under magnetic stirring at 1200 rpm. At this stage, first the oil emulsion in water consisting of large droplets of solid lipid and liquid lipid were produced and then converted into fine droplets using a magnetic stirrer (Fan Azma Gostar) at 1200 rpm. Finally, to reduce the size of nanoparticles, the synthesized formulation was transferred into the homogenizer (development of Iranian ultrasonic technology) and homogenized for 15 min with 10 sec of homogenizing and 3 sec of rest between cycles. It was then placed in the ice bath for 10 min to form incomplete lipid nanostructured crystals. Due to the placement of the surfac-tant layer around each of the lipid nanostructures and creating a spatial barrier between the two structures, after cooling and crystal formation, stable dispersed nanostructured lipid carri-ers were produced in an aqueous medium.

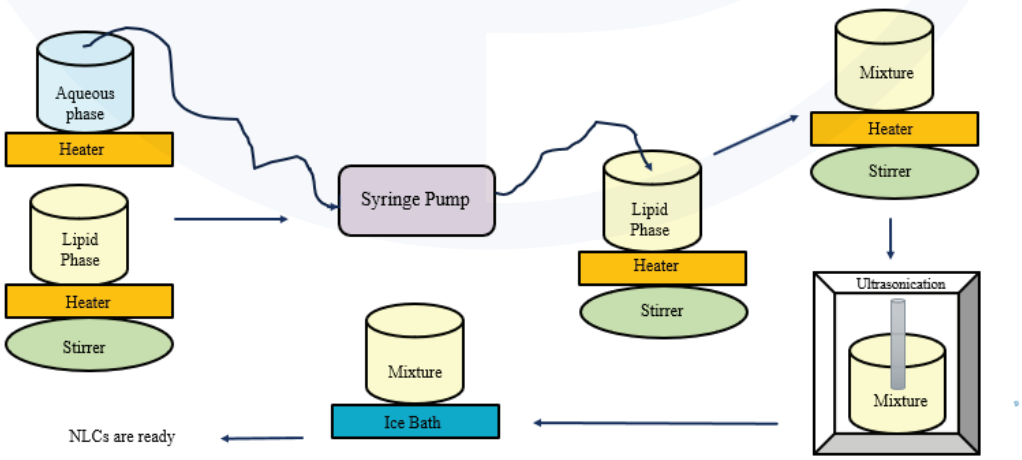

Fig 1. Synthesis process of NLC in the present study.

Dynamic Light Scattering

Mean particle size, scattering index and surface charge of lipid nanostructures were measured using a dynamic light scattering device (Brookhaven/Plus Palse90/USA). All samples were diluted with deionized water. Then, the particle size and the amount of scattering index were calculated by this device with automatic measuring mode at a constant angle of 90 ° at 25 °C and the surface charge according to the electrophoretic mobility.

Preparation, Treatment of Hair Samples

Before performing functional assays, all hair was washed with non-ionic detergent (baby hair shampoo) and water (Shavandi et al., 2017). 0.05 g of black natural human hair fiber was used as a control (intact and not subjected to the TCF1) and the same amount was used as a sample (damaged by ultraviolet light and treated with NLC prepared under the influence of the TCF1). Damage induction in hair keratin, protein extraction, and concentration assays are elaborated as follows. UV irradiation of human hair After preparing hair with "synthesized NLC solutionunder influence of TCF1", they were irradiated for six hour using a modeled source of UVA and UVB (Osram) ultraviolet radiation. After that, the hair was washed again with non-ionic shampoo (baby hair shampoo) and further dried before analysis (Prasertpol & Tiyaboonchai, 2020). Finally, external lipids and hair fiber contaminants were removed by immersing the hair fiber in distilled water for one hour and then treating it with a 2:1 v/v chloroform: methanol (merc) solution for 24 hrs. (Shavandi et al., 2017).

Protein extraction and assay Preparation of buffer solution: Tris-HCl (25 mM), thiourea (2.6 M), urea (5 M), and 2-mercaptoethanol (Merc) were used to prepare the buffer solution. To prepare 160 ml buffer, dissolve 1.21 g Tris powder in 20 ml deionized water and then add 200 ł l HCl to the pH solution to bring it to pH 8.5 and bring the volume of the ÿnal solution to 40 ml. Dissolve 7.9 g thiourea in 40 ml deionized water, then add 12 g urea and bring the volume of the ÿnal solution to 80 ml. 5% mercaptoethanol solution was pre-pared using 2 ml mercaptoethanol and 38 ml deionized water and was added to the solution containing Tris-HCl, thiourea, and urea.

Finally, the final solution was homogenized with Vertex (Shavandi et al., 2017; Nakamura et al, 2002; Cassoni et al, 2018). Extraction of keratin: Hair samples in chloroform/methanol solution were washed with distilled water and then were dried. The samples were cut into pieces with a length of 1 to 2 mm and immersed in 5 ml of the prepared buffer solution (mentioned in the previous section). It was then kept in an incubator (Binder Germany) at 48 °C for 48 hrs. In the last step, filtration was performed using 0.2 micron filter (Sartorius/Germany), and finally, samples were centrifuged (Hitachi, Japan) with 16000×g for 15 min at room temperature. The supernatant was used as hair protein (keratin) (Cassoni et al, 2018). Determination of keratin concentration by Bradford protocol: Ingredients for this test included standard BSA solution (Sigma) with a concentration of 1 mg/ml and solutions with concentrations of 0.02, 0.04, 0.06, 0.08, and 0.1 mg/ml were prepared from it. The Bradford reagent is prepared as follows: first, dissolving 10 mg of Coomassie Blue G250 in 10 ml of methanol, second, adding 10 ml of 85% H3PO4 and 50 ml of H2O to the solution, then, passing the solution through a filter and finally, bringing the volume to 100 ml. Bradford solution was stored at 4 °C away from light. The test steps are as follows: Pipette 100 µl of each standard and unknown sample solution into the microplate wells, add 100 µl of Bradford reagent to each well, mix the samples gently by shaking the microplate, and incubate at room temperature for at least five minutes (Bradford, 1976).

The absorption intensity of blue dye was determined by the amount of protein in the solution by a microplate reader (Power Wave XS2, BioTek, USA) at 595 nm. The concentration of keratin was calculated using the standard BSA curve in the concentration range of 20 to 100 µl/ml (Bradford, 1976).

Results

Structural investigation of NLC solution:

The results of dynamic light scattering from the sample and control of this study are shown in Table 1. Particle distribution data of sample and control obtained from DLS method have been shown in figures 2 and 3.

Table 1 . Obtained data of measuring the colloidal properties of the sample and control using DLS

Name	Particle Size range/nm	Effective diameter/nm	Var.	Max Size/nm	PDI	Zeta potential/mV	Mobility
Control	74.01-106.83	350.0	0.1	81.13	0.32±0.01	-16.23±1.49	-1.27
Sample	70.07-106.11	432.9	0.5	80.46	0.22±0.02	-33.10±0.49	-2.59

As shown in Table 1, the diameter of NLCs and zeta potential of the sample increased by about 7% and 100% in comparison with the control. Moreover, the PDI of the sample decreased by about 31% in comparison with the control.

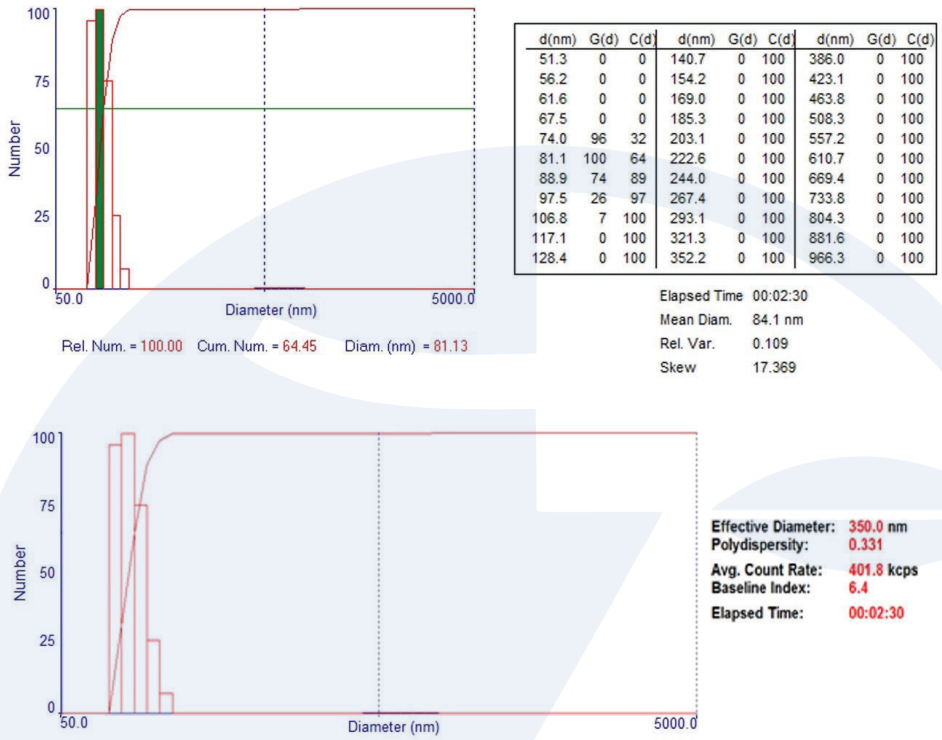

Figure 2. Distribution diagram of the NLC particles of the control.

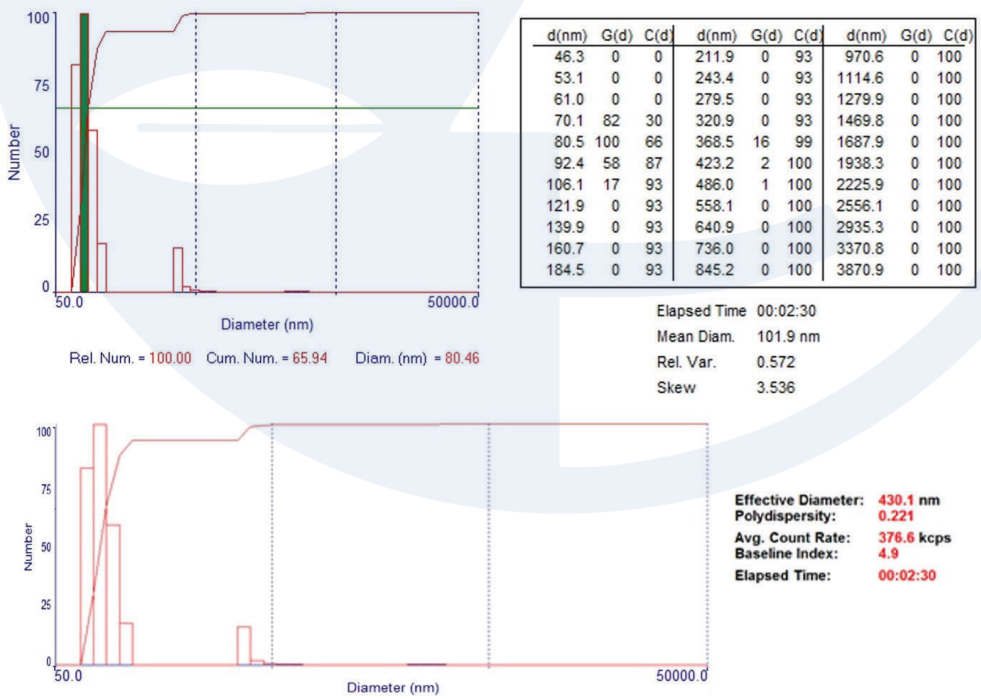

Figure 3. Distribution diagram of the NLC particles of the sample.

Functional investigation of the NLC particles:

The functional effects of TCF1 on irradiated hair (by mediating treated NLC particles), have been investigated by examining the absorption of keratin protein at wavelength 595 nm.

The keratin absorption and concentration in the sample and controls are shown in Figure 3 and Table 2, respectively.

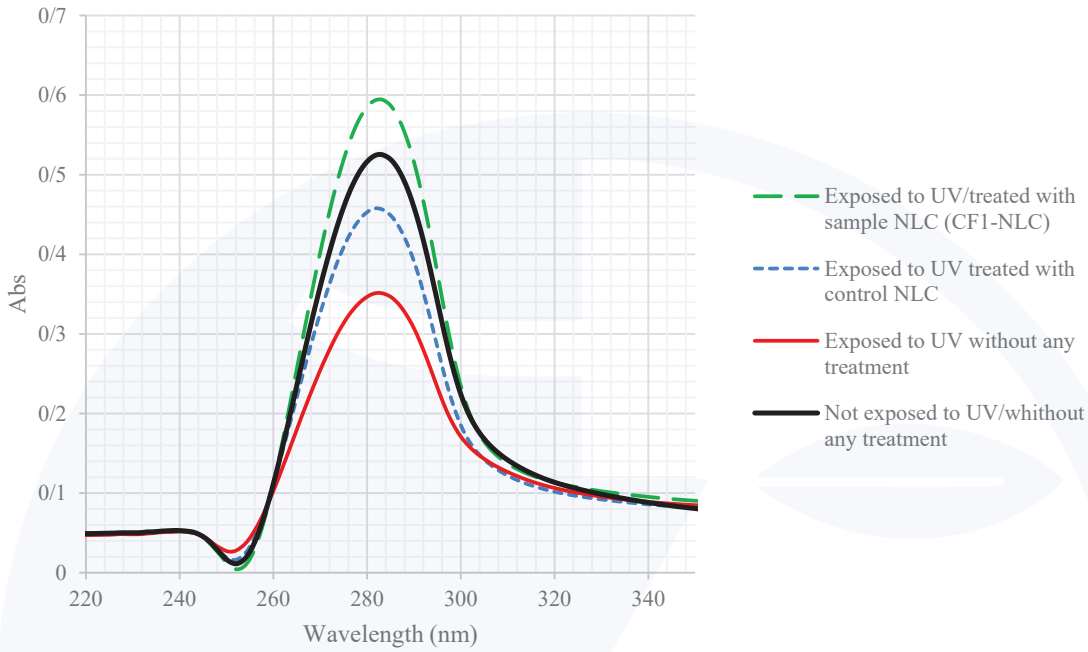

Figure 4. UV-VIS spectrophotometry of keratin in the samples and controls of the present study.

Table 2 . λmax and concentration of keratin calculated in the sample and controls (obtained from the data of the Figure 4)

Hair sample	λmax/nm	Intensity	Keratin Concentration (µg/ml)	change in comparison with natural hair
Exposed to UV radiation-treated with sample NLC	283	0.594	69.7±0.2	(%) +16
Not exposed to UV/without NLC treatment (natural healthy hair)	283	0.525	59.9±0.1	- - 15 -40
Exposed to UV radiation-treated with control NLC	282	0.457	50.8±0.3	
Exposed to UV/without NLC treatment	282	0.351	38.0±0.2	

As can be seen in Figure 4 and Table 2, UV-irradiated hair samples show hyperchromization and blueshift under the influence of TCF1-treated NLCs particles, which in addition to repairing the damage caused by the UV radiation, show the improved structure and increased concentration of keratin protein even compared to the healthy sample.

DISCUSSION AND CONCLUSION

The application of NLCs as drug-carrying nanoparticles with self-organizing ability has received significant attention. Since they display very low or no toxicity, they increase the time of drug action through a prolonged half-life and a controlled release of the drug (García-Pinel et al., 2019). These compounds are produced from surfactants and lipids in their various phases in the aqueous medium (Bhaskar et al., 2009). Water molecules at the center of these structures can transport various hydrophilic pharmaceutical compounds. This study has emphasized on the self-organizing properties of these compounds and the important role of water in their formation and structure.

In the first step of this study, using the DLS technique, the effect of TCF1 on the structure of NLC particles and their accumulation in the colloidal environment was investigated. The polydispersity index (PDI) is an important parameter that describes the particle size distribution and varies between 0 to 1; PDI less than 0.1 indicates a monodisperse particle, and the values greater than 0.1 indicates polydisperse particle size distributions. In addition to particle size, the zeta potential (ZP) is used as an indicator of the effective and stable nanoparticulate system (L Kiss et al., 2019). This parameter indicates the degree of repulsion between the charged particles in the dispersion. High ZP means more charged particles, which prevents the accumulation of particles due to electrical repulsion. If the ZP is low, gravity overcomes repulsion, making the mixture more likely to coagulate. The zeta potential value equal to -30 mV is considered good stability of nanoparticle particle distribution.

According to the results of this study, the rate of polydispersity of the sample treated by the TCF1 has decreased by about 31% compared to the control and is closer to the mono distribution. Also, the zeta potential of the sample has increased to more than twice the value of the control zeta potential, which indicates the significant stability of the sample and approaching the optimum number of zeta potential for nanoparticles; interestingly, there is not a massive change in the particle size of the sample compared to the control (about 6%). This result suggests that TCF1 has changed the attributes of particles of the system without affecting the overall dimension of each particle.

In the second step, these structural changes in the synthesized NLCs under the influence of the TCF1, were confirmed by the remarkable effect on the performance of these samples in the treatment of keratin of UV-irradiated hair. Accordingly, the absorption of keratin protein at the wavelength of 595 nm measured in two groups, including the damaged sample (dam-aged hair and treated with NLC carriers made under the TCF1 treatment), compared to control conditions (1- damaged hair without NLC treatment and 2- damaged hair treated by NLC synthesized without the influence of TCF1, and 3- healthy hair without any treatment). The results showed that not only did TCF1 repair damaged hair samples but it also optimized the structure of the target protein (16% healthier than the control without UV irradiation).

According to the theory of TCFs, the effect of these non-ma-terial/non-energetic fields occurs through the transfer of the data and information related to repairing the system under study from the whole consciousness (CCN). The obtained re-sults in this experiment are consistent with previous studies on TCF1. For example, modification of biological molecules and cells has been reported in various studies (Taheri et al., 2020; Taheri et al., 2021a; Taheri et al., 2021d). This study ex-posed NLCs to TCF1 to investigate whether this field could transfer information to improve damaged hair protein caused by UV-irradiated. In fact, the total accumulation of NLC par-ticles and the water in their center is used as a carrier for data and information transmitted by the TCF1 to repair the system under study. Moreover, considering the self-organizing prop-erties of NLCs and their remarkable similarity with the initial membrane structures that are affected by destructive ultravi-olet waves at the beginning of life, the study of the improving effects of TCF1 on the structure of NLCs and, of course, on the UV-destructed biologic protein, make significant connections with theories of the beginning of life and the possible role of TCFs.

Based on the data obtained from this study, the follow-ing conclusions can be made. In summary, the effect of the TCF1 on keratin protein as an essential structural protein of the cellular cytoskeleton was proved. Then, the effect of the TCF1 on protection against a possible life-threatening agent, ultraviolet radiation, at the level of biomolecules, was confirmed. Also, the results of this study indicate the receipt of data and information on the treat-ment of the system under study by the sample particles from TCF1. Finally, the effect of TCF1 on the sample shows a mas-sive increase in the zeta potential of the particles in the same media and components without considerable change in the dimensions and size of the constituent particles. Considering the results, the transferred data and information from TCF1 at the system level may be related to the huge increase in electric charge (electrical energy) of the sample particles.

ACKNOWLEDGMENT

Authors would like to acknowledge Department of Biophysics, University of Tehran, Tehran, Iran for providing data acquisition services for this

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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