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Editorial

Current Insights on Lipid-Based Nanosystems 2023

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Among the different types of nanosystems that have been investigated for therapeutic use, lipid-based ones are the most explored, as they have advantages over non-lipid nanosystems, especially for improving the transport and efficacy of drugs through different routes of administration, such as ocular, cutaneous, intranasal, and intravenous [1–18].

The concept of lipid-based nanosystems is broad and includes solid lipid nanoparticles (SLN), nanostructured lipid carriers (NLC), cationic lipid nanoparticles, liposomes, exosomes, nanoemulsions, microemulsions, and self-nanoemulsifying systems. Studies have shown that these nanosystems are promising for improving the efficacy of lipophilic drugs or nucleic acids in different therapeutic applications, especially those that respond to unmet medical needs [2,4,19–26].

In the second edition of the Special Issue on lipid-based nanosystems, we notice that research in this field remains very active, as we published 16 works, including 10 research articles and 6 review articles, which were the following:

1. Aljuffali, I.A.; Anwer, M.K.; Ahmed, M.M.; Alalaiwe, A.; Aldawsari, M.F.; Fatima, F.; Jamil, S. Development of Gefitinib-Loaded Solid Lipid Nanoparticles for the Treatment of Breast Cancer: Physicochemical Evaluation, Stability, and Anticancer Activity in Breast Cancer (MCF-7) Cells. *Pharmaceuticals* **2023**, *16*, 1549. https://doi.org/10.3390/ph16111549.
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3. Arif, S.T.; Khan, M.A.; Zaman, S.u.; Sarwar, H.S.; Raza, A.; Sarfraz, M.; Bin Jardan, Y.A.; Amin, M.U.; Sohail, M.F. Enhanced Antidepressant Activity of Nanostructured Lipid Carriers Containing Levosulpiride in Behavioral Despair Tests in Mice. *Pharmaceuticals* **2023**, *16*, 1220. https://doi.org/10.3390/ph16091220.
4. Tyagi, R.; Waheed, A.; Kumar, N.; Ahad, A.; Bin Jardan, Y.A.; Mujeeb, M.; Kumar, A.; Naved, T.; Madan, S. Formulation and Evaluation of Plumbagin-Loaded Niosomes for an Antidiabetic Study: Optimization and In Vitro Evaluation. *Pharmaceuticals* **2023**, *16*, 1169. https://doi.org/10.3390/ph16081169.
5. Ahalwat, S.; Bhatt, D.C.; Rohilla, S.; Jogpal, V.; Sharma, K.; Virmani, T.; Kumar, G.; Alhalmi, A.; Alqahtani, A.S.; Noman, O.M.; et al. Mannose-Functionalized Isoniazid-Loaded Nanostructured Lipid Carriers for Pulmonary Delivery: In Vitro

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Prospects and In Vivo Therapeutic Efficacy Assessment. *Pharmaceuticals* **2023**, *16*, 1108. https://doi.org/10.3390/ph16081108.

6. Peczek, S.H.; Tartari, A.P.S.; Zittlau, I.C.; Diedrich, C.; Machado, C.S.; Mainardes, R.M. Enhancing Oral Bioavailability and Brain Biodistribution of Perillyl Alcohol Using Nanostructured Lipid Carriers. *Pharmaceuticals* **2023**, *16*, 1055. https://doi.org/10.3390/ph16081055.
7. Satyanarayana, S.D.; Abu Lila, A.S.; Moin, A.; Moglad, E.H.; Khafagy, E.-S.; Alotaibi, H.F.; Obaidullah, A.J.; Charyulu, R.N. Ocular Delivery of Bimatoprost-Loaded Solid Lipid Nanoparticles for Effective Management of Glaucoma. *Pharmaceuticals* **2023**, *16*, 1001. https://doi.org/10.3390/ph16071001.
8. Garrós, N.; Bustos-Salgados, P.; Domènech, Ò.; Rodríguez-Lagunas, M.J.; Beirampour, N.; Mohammadi-Meyabadi, R.; Mallandrich, M.; Calpena, A.C.; Colom, H. Baricitinib Lipid-Based Nanosystems as a Topical Alternative for Atopic Dermatitis Treatment. *Pharmaceuticals* **2023**, *16*, 894. https://doi.org/10.3390/ph16060894.
9. Tong, Y.; Shi, W.; Zhang, Q.; Wang, J. Preparation, Characterization, and In Vivo Evaluation of Gentiopicroside-Phospholipid Complex (GTP-PC) and Its Self-Nanoemulsion Drug Delivery System (GTP-PC-SNEDDS). *Pharmaceuticals* **2023**, *16*, 99. https://doi.org/10.3390/ph16010099.
10. Rincón, M.; Espinoza, L.C.; Silva-Abreu, M.; Sosa, L.; Pesantez-Narvaez, J.; Abrego, G.; Calpena, A.C.; Mallandrich, M. Quality by Design of Pranoprofen Loaded Nanostructured Lipid Carriers and Their Ex Vivo Evaluation in Different Mucosae and Ocular Tissues. *Pharmaceuticals* **2022**, *15*, 1185. https://doi.org/10.3390/ph15101185.
11. Paiva, D.d.F.; Matos, A.P.d.S.; Garófalo, D.d.A.; do Nascimento, T.; Monteiro, M.S.d.S.d.B.; Santos-Oliveira, R.; Ricci-Junior, E. Use of Nanocarriers Containing Antitrypanosomal Drugs for the Treatment of Chagas Disease. *Pharmaceuticals* **2023**, *16*, 1163. https://doi.org/10.3390/ph16081163.
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14. Gugleva, V.; Andonova, V. Recent Progress of Solid Lipid Nanoparticles and Nanostructured Lipid Carriers as Ocular Drug Delivery Platforms. *Pharmaceuticals* **2023**, *16*, 474. https://doi.org/10.3390/ph16030474.
15. Richards, T.; Patel, H.; Patel, K.; Schanne, F. Endogenous Lipid Carriers—Bench-to-Bedside Roadblocks in Production and Drug Loading of Exosomes. *Pharmaceuticals* **2023**, *16*, 421. https://doi.org/10.3390/ph16030421.
16. Torres, J.; Costa, I.; Peixoto, A.F.; Silva, R.; Sousa Lobo, J.M.; Silva, A.C. Intranasal Lipid Nanoparticles Containing Bioactive Compounds Obtained from Marine Sources to Manage Neurodegenerative Diseases. *Pharmaceuticals* **2023**, *16*, 311. https://doi.org/10.3390/ph16020311.

Among the articles published in this Special Issue on lipid-based nanosystems, the lipid nanoparticles, specifically NLC, are the most explored, which suggests the potential of these systems to reach clinic in the upcoming years. Regarding the most investigated diseases, these include cancer, brain diseases, ocular diseases, skin diseases, microbial infections, and metabolic diseases. Thereby, we hope that all these works will contribute to the advancement of these scientific fields.

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