

# Reducing injection alleviated pulmonary edema by protecting glycoalyx in septic mice

Chaiyan, Fangyipeng, Guozhe, Zhanghuijuan, Wangzhong, Tsinghua

---

**ABSTRACT:** Cubosomes and hexosomes are receiving much attention in drug delivery, particularly due to their unique properties, nanostructural versatility and capability of solubilizing various drugs and bio-imaging probes. However, their poor biocompatibility in human blood and the possibility of inducing hemolysis and inadvertent activation of the complement system (which is the first line of the body's defense system) are limiting their use in parenteral application (e.g., IV). Therefore, it is imperative to understand the factors affecting these incompatibility issues, including the stability of these nanostructured dispersions on direct exposure to biological fluids such as plasma and the potential toxicity of the main lipid constituents or stabilizers, which need to be considered as a first step towards designing safe and efficient injectable nanocarriers. This work present complementary biophysical methods involving SAXS, cryo-TEM, and NTA that were used to

gain insight into the structural stability, morphological and size characteristics of these non-lamellar liquid crystalline (LC) nanodispersions upon plasma incubation, as well as to highlight the mechanistic issues pertaining hemocompatibility. Through optimization of lipid core, we showed an intriguing LC nanodispersions that could totally overcome plasma-induced destabilization effect on the internal nanostructures and bypassed hemolysis and complement activation as well as potentially modulate the susceptibility to macrophage uptake, which particularly interesting and beneficial in the application of non-inflammatory MPS targeting. Although there is still a long way to go for the development of pharmaceutical viable cubosomes and hexosomes as injectable nanocarriers, this study could be of interest for future exploitation in the development of immune-safe and cost-effective soft nanocarriers for delivering sensitive therapeutic/contrast agents.

---

## Biography:-

Chai Yan is a medical student at the School of Medicine of Tsinghua University, majoring in emergency medicine. He has been engaged in research on acute and critical illness for 6 years. He worked in the emergency department for two years before. During this period, he was very interested in sepsis. So his main research direction is the prevention and treatment of sepsis. The specific research direction is the role of endothelial cells in improving microcirculation in sepsis. Similarly, he is very interested in the therapeutic effects of Chinese medicine. He believes that Chinese medicine should have a greater effect. He loves the emergency department and is passionate about the work of the emergency department.

## REFERENCES

1. Green's function for second order elliptic equations with singular lower order coefficients
2. On scale invariant bounds for Green's function for second order elliptic equations with lower order coefficients and applications
3. Boundary value problems in Lipschitz domains for equations with lower order coefficients
4. Boundary value problems in Lipschitz domains for equations with drifts
5. Scale invariant regularity estimates for second order elliptic equations with lower order coefficients in optimal spaces

**Citation:** Chai Yan; 2nd Conference on Advances in Nursing Education and Research; Nursing Research 2021; July 23-24, 2021; Dubai, UAE.

---

University, Beijing, China



This open-access article is distributed under the terms of the Creative Commons Attribution Non-Commercial License (CC BY-NC) (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits reuse, distribution and reproduction of the article, provided that the original work is properly cited and the reuse is restricted to noncommercial purposes. For commercial reuse, contact [reprints@pulsus.com](mailto:reprints@pulsus.com)

---