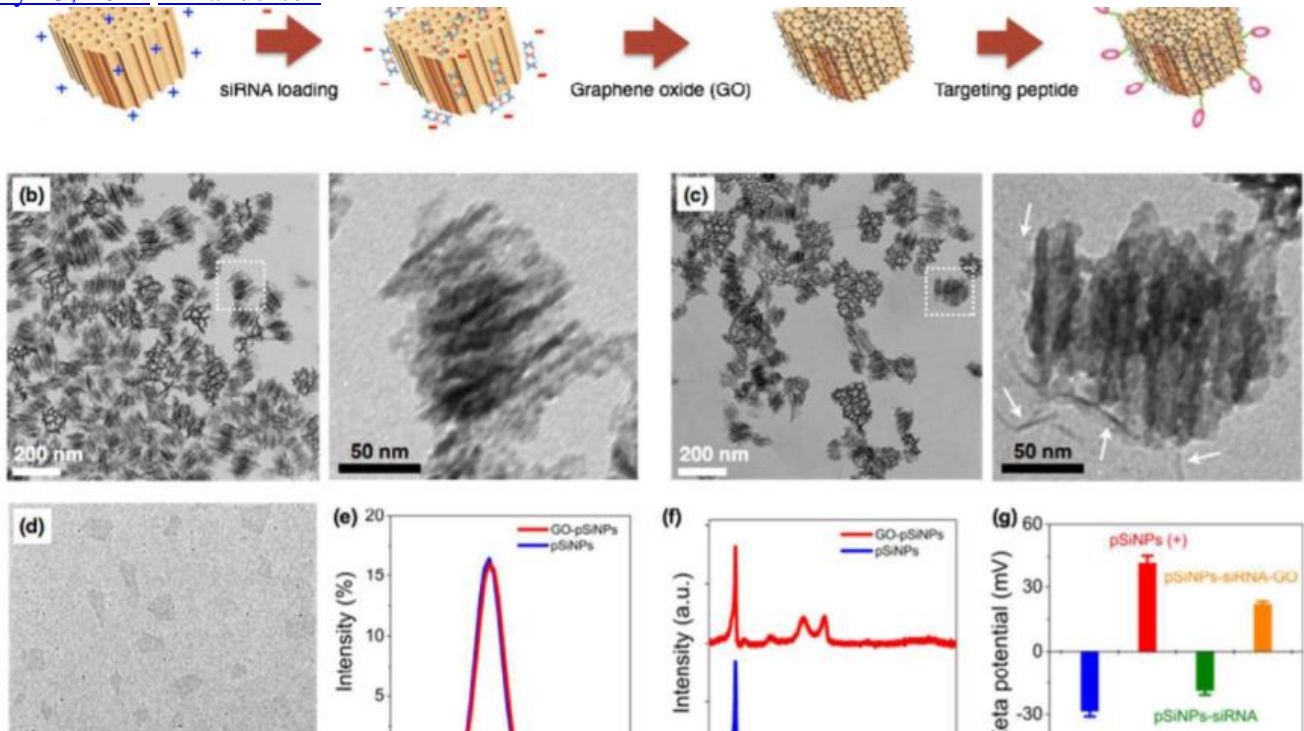


Graphene nanoparticles targeting siRNA delivery in the brain

July 13, 2021 mikandersen



Reference

- Joo, J.; Kwon, EJ; Kang, J.; Skalak, M.; Anglin, EJ; Mann, AP; Sailor, M.J. (2016). Porous silicon-graphene oxide core-shell nanoparticles for targeted delivery of siRNA to the injured brain. *Nanoscale Horizons*, 1(5), p. 407-414. <https://doi.org/10.1039/C6NH00082G>

Facts

- The authors present a method to develop “ siRNA ” interfering RNA therapies to treat brain diseases. It has been shown that porous silicon nanoparticles coated with graphene oxide allow them to carry a viral load of RNA that can penetrate the target area, avoiding activation of the immune system. This allows the accumulation of siRNA cargo in the designated affected or injured area of the brain, causing gene interference and silencing for genetic modification of the disease. In fact, it says "*Efforts to overcome these obstacles have resulted in a number of siRNA delivery strategies. A variety of approaches have been pursued to increase stability and evade immune system activation through the use of viral or non-viral nanocarrier-enabled delivery systems. Viral vectors that deliver siRNA in the form of the viral genome have been shown to effectively achieve gene silencing, but scaling-up challenges, low carrying capacity, and safety concerns such as mutagenesis or immunogenicity have so far limited clinical translation of these constructs.*"
- The article refers to the form of administration of the nanoparticle solution "Intravenous administration of nanoparticles in brain-injured mice results in substantial accumulation specifically at the site of injury."

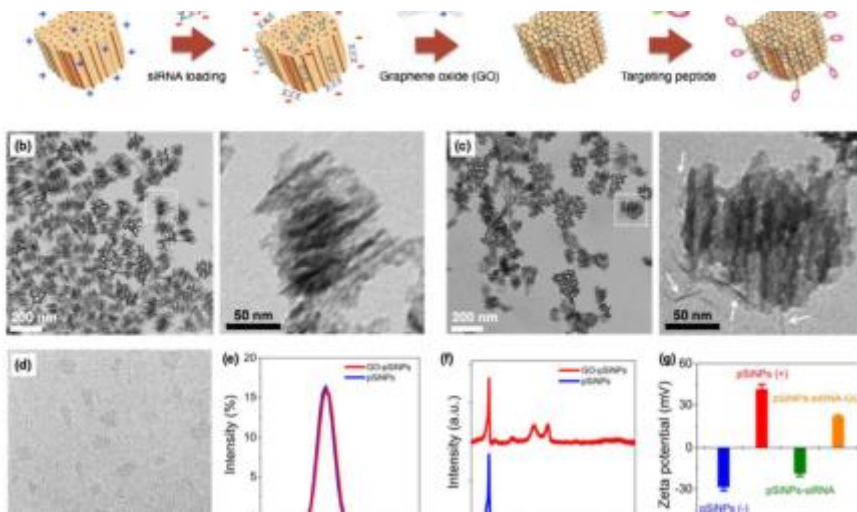


Fig.1. SiRNA process with graphene oxide for the interference of the immune system that allows the treatment of neurodegenerative diseases. (Joo, J.; Kwon, EJ; Kang, J.; Skalak, M.; Anglin, EJ; Mann, AP; Sailor, MJ 2016)

Opinions

- The article demonstrates that graphene oxide is used as a carrier or vector for viral RNA payloads. This allows us to infer that it is possible to transmit a virus through the graphene oxide nanoparticles, and that they reach the brain. This is very illuminating because it means assuming that a way has been found to invade the impregnable enclosure of the brain, in order to modify its genetics, affect its functioning with gene therapies or gene silencing, with a procedure very similar to that used in vaccines. against c0r0n@v|r/us.

Hypothesis

- It is possible to hypothesize that the vaccines against the c0r0n@v|r/us, which present solid evidence of the presence of graphene oxide (Campra, P. 2021), serve to transport messenger RNA mRNA, but also other types of RNA, such as siRNA for gene interference or silencing. All this leads to the possibility that they serve to carry viral loads, and even implement the genetic edition of the human being with CRISPR techniques.

Bibliography

- Campra, P. (2021). [Report]. Detection of graphene oxide in aqueous suspension (Comirnaty™ RD1): Observational study in light and electron microscopy. University of Almeria. <https://docdro.id/rNgtxyh>
- Joo, J.; Kwon, EJ; Kang, J.; Skalak, M.; Anglin, EJ; Mann, AP; Sailor, M.J. (2016). Porous silicon–graphene oxide core–shell nanoparticles for targeted delivery of siRNA to the injured brain. *Nanoscale Horizons*, 1(5), p. 407-414. <https://doi.org/10.1039/C6NH00082G>