C0r0n@ 2 Inspect

Review and analysis of scientific articles related to experimental techniques and methods used in vaccines against c0r0n@v|rus, evidence, damage, hypotheses, opinions and challenges.

Monday, July 19, 2021

Graphene oxide and brain stimulation by EM electromagnetic waves capable of inferring in the human mind

Reference
Li, X .; Xiong, H .; Rommelfanger, N .; Xu, X .; Youn, J .; Slesinger, PA; Qin, Z. (2021). Nanotransducers for wireless neuromodulation. Matter, 4 (5), pp. 1484-1510.
https://doi.org/10.1016/j.matt.2021.02.012

Introduction

1. Before beginning with the analysis of the article, it is convenient to clarify the concept of "transducer". A transducer is a device capable of converting a signal into energy or a transmitted energy into a signal. It should be known that there are various types of transducers, the "sensors" and the "actuators". The actuators receive information that they translate into energy, for example electrical impulses, voltage variations, etc. A sensor converts energy into a signal or information. For example, a microphone is a transducer that transforms voice or sound vibrations into electrical energy according to variations in voltage.
2. On the other hand, the concept of "neuromodulation" refers to the neuroscientific technique in charge of nerve stimulation of the brain for the treatment of pathologies and injuries. It is usually done using electromagnetic impulses, biochip implants, traditional and flexible electrodes, ultrasound, etc.
3. If the two concepts are united, it is possible to understand the object of the article. This is the study of new methods of brain interaction using nano-scale transducers, wirelessly, using electromagnetic waves.

Facts

1. The researchers in their abstract recognize the advances of " *nano-transducers to modulate and interact with the nervous system* ." For this reason they analyze " *the transmission and processing of signals within the central nervous system* ", since " *nanomaterials have emerged as a unique class of neural interfaces due to their small size, remote coupling and conversion of different energy modalities, various methods management and mitigated chronic immune responses* ". They also add that the new nanotransducers " can interact with the neural system without physical wires " through non-invasive wireless means such as ultrasound, electromagnetic fields, temperature and electro-chemical activators.

2. The article is not accessible for full text consultation, not even using the well - known Sci-Hub website . However, it has been possible to verify the presence of the keyword "graphene oxide" in the body of the text and some of the figures and illustrations included. The bibliography has also been reviewed, which helps to greatly clarify the question that is discussed here, "the implications of graphene oxide in brain stimulation, by means of electromagnetic waves and its ability to infer in thought" and in addition, "if it is possible the existence of graphene oxide transducers on the precise scale, expressed in the sample of (Campra, P. 2021).
5. The illustrations of the reference corresponding to this entry are reviewed below (Li, X.; Xiong, H.; Rommelfanger, N.; Xu, X.; Youn, J.; Slesinger, PA; Qin, Z. 2021). We begin with figure 1. This is the scheme for brain neuromodulation. Note that nano-transducers are required in order to act in the brain, which are described in the article on a nano-scale. On the other hand, the brain's signal and stimulus reception interface are neurons, astrocytes and microglia (which were already discussed in a previous post). In order to act on this interface, it is necessary to apply some type of energy or signal to the brain cells. The figure shows perfectly, various types of actuation, electromagnetic, thermal, ultrasonic, although as it will be observed hereafter, there are more methods.

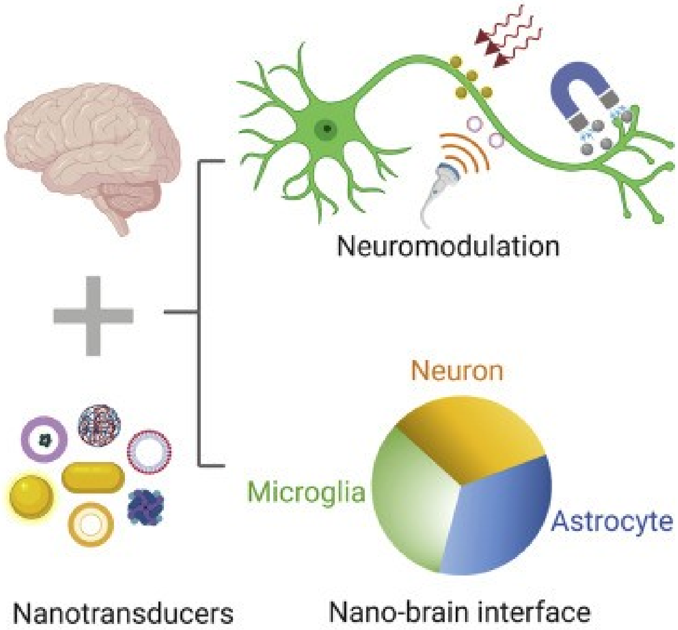

Fig. 1. Scheme for brain neuromodulation

In figure 2, it is observed how the transducers act from various forms of energy (photoelectric, magnetic and ultrasound) and how the transducers convert it into signals that the brain cells can interpret, for example heat, voltage, chemical signal, photonics. or mechanical-sensitive. It is very interesting to observe that the electrical, mechanical and thermal signal depends on the capacitance of the membrane with which the transducer is in contact. Curiously, this is dealt with directly in the work of (Rauti, R.; Lozano, N.; León, V.; Scaini, D.; Musto, M.; Rago, I.; Ballerini, L. 2016) entitled " *Graphene oxide nano-leaves remodel synaptic function in cultured brain networks*"where the membrane capacitance of hippocampal neuronal cells in the presence of reduced graphene oxide" rGO "is addressed, treated as" sGO "(Small Graphene Oxide), the results obtained in table 1 can be verified. proves that graphene oxide has been studied for its input resistance and capacitance, to act as a transducer for brain cells.

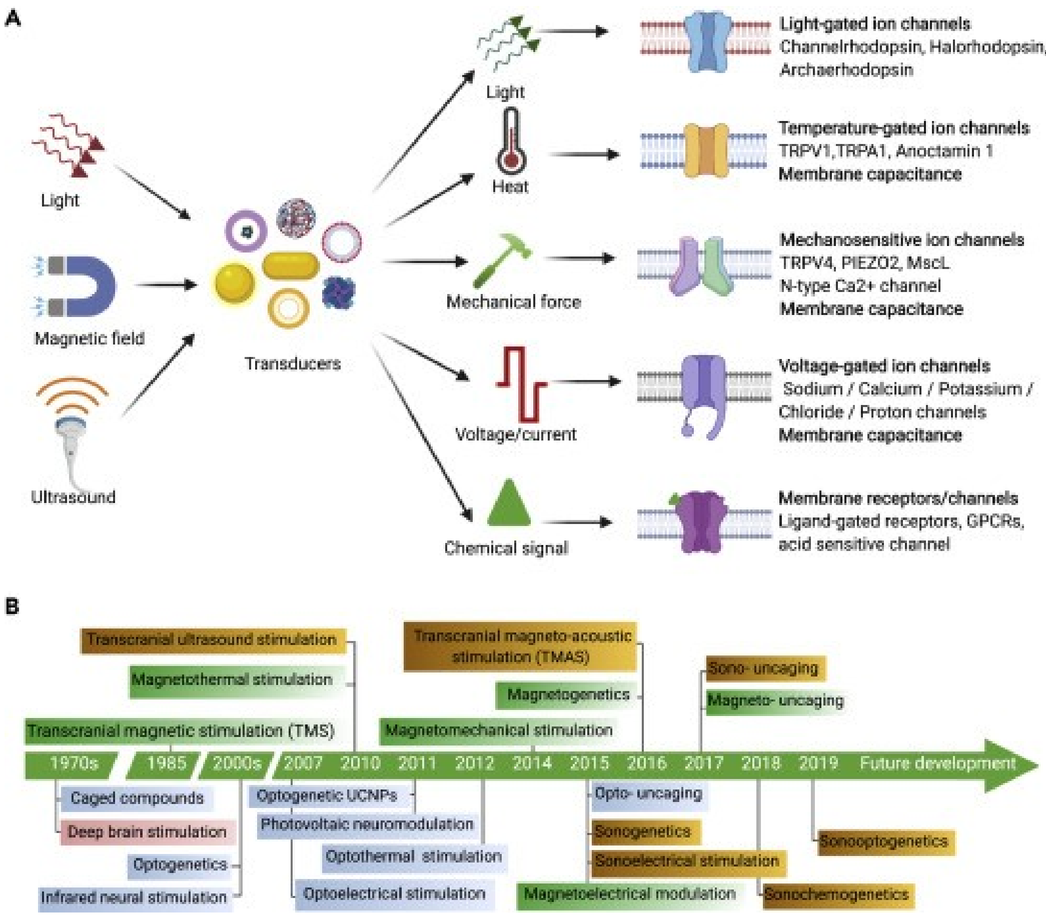

Fig. 2. Evolution of transducers and their application possibilities

	capacitancia (pF)	resistencia de entrada (MΩ)
control $_1$ (n = 24)	59 ± 4	976 ± 138
melamina $_1$ (n = 28)	46 ± 5	1036 ± 132
s-GO $_1$ (n = 27)	62 ± 8	876 ± 145
GR $_1$ (n = 30)	50 ± 5	1029 ± 161
control $_{10}$ (n = 20)	57 ± 7	744 ± 82
melamina $_{10}$ (n = 25)	72 ± 16	717 ± 106
s-GO $_{10}$ (n = 18)	67 ± 6	997 ± 156
GR $_{10}$ (n = 25)	59 ± 18	1223 ± 501

Table 1. Properties of the passive neuronal membrane after exposure to GR and s-GO (rGO)

Continuing with the analysis of figure 2b, the evolution of the transducers from 1970 to the present can be seen. The number of transduction methods developed since 2007 is astonishing. In order to determine which of them are the most relevant, those directly related to graphene oxide "GO" will be discussed in the scientific literature, which matches the scale observed in the study by (Campra, P. 2021):

a) **Optogenetics** (Optogenetics) - It is the transduction methodology that uses genetics and optics to activate and deactivate brain cells with pulses of light. Some means of dissemination released the Stanford University study (Montgomery, KL; Yeh, AJ; Ho, JS; Tsao, V.; Iyer, SM; Grosenick, L.; Poon, AS 2015), which had a high impact on the scientific community for wirelessly achieving laboratory rat control. In fact, this discovery was the beginning to implement this technology, with the reduced graphene oxide nanomaterial "rGO", as can be seen in (Huang, WC; Chi, HS; Lee, YC; Lo, YC; Liu, TC; Chiang , MY; Chen, SY 2019 | Bolotsky, A.; Butler, D.; Dong, C.; Gerace, K.; Glavin, NR; Muratore, C.; Ebrahimi, A. 2019)

b) **Thermal Modulation** (Thermal modulation) - is the methodology transduction using heat to cause activation or deactivation of brain cells. In Figure 5b, the authors refer to it with the term "Optothermal transducers". Interestingly, thermal modulation studies with graphene are being developed such as that of (Liu, X.; Zhang, G.; Zhang, YW 2015) where " *the viability of 1-layer graphene (1 atom thick) as a modulator is demonstrated. thermal*"As indicated, when acting with electromagnetic EM waves, it is possible to induce a change in the frequency of the phonons of a graphene sheet, generating temperature differentials at the ends of the graphene sheets, see figure 3. Phonons are quasiparticles vibrating in the atomic lattice of a solid, in this case, graphene (Lin, S.; Buehler, MJ 2014). This is so, since the experiments of (Kunal, K.; Aluru, NR 2013) of loss mediated by phonons in a graphene nanocitant, showed that with an electromagnetic frequency of forcing Q of 40 GHz it is possible to scale the temperature of the phonons in said sheet. This has important repercussions, since it means, accept, affirm and corroborate that the frequencies electromagnetic signals of 5G technology , between 25.5 and 40 GHz, absorbed by graphene oxide nanoparticles (Chen, Y.; Fu, X.; Liu, L.;Zhang, Y .; Cao, L .; Yuan, D .; Liu, P. 2019), can modulate and de in fact they modulate their temperature and with it the brain cells, for their control and interaction, see also " Graphene Oxide and the Electromagnetic Absorption of 5G . "The facts about the 40 GHz frequency are also described by (Graef, H.; Wilmart, Q.; Rosticher, M.; Mele, D.; Banszerus, L.; Stampfer, C.; Plaçais, B. 2019) who state textually " *All samples are integrated in a three-port coplanar waveguide for characterization of DC (direct current), quasi-DC (10 kHz blocking measurements) and radio frequency (RF) of 40 GHz for the variable characterization of the temperature* ".

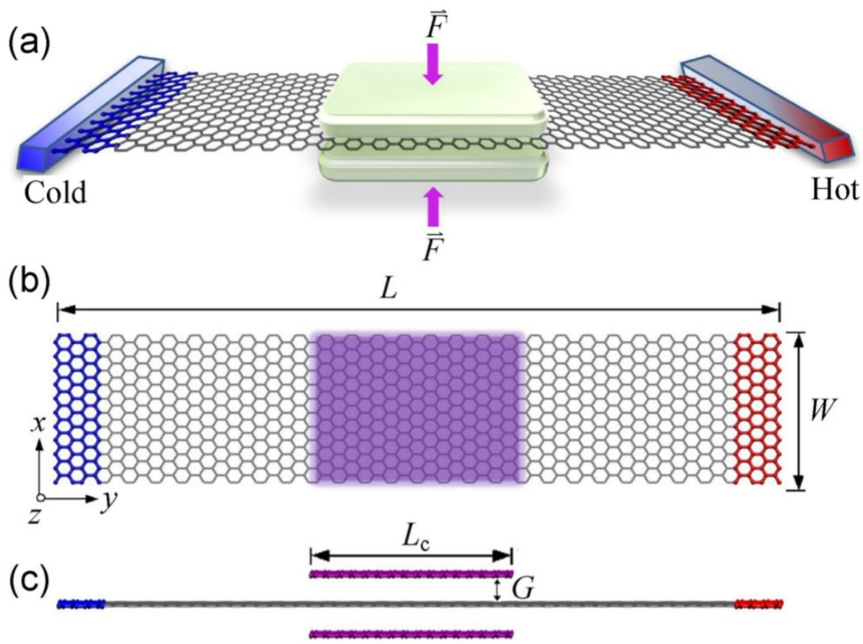

Fig. 3. Graphene thermal modulator

Figure 4a shows the nanometric scale in which the different actors in the study can be compared. The size of the nano-transducers is particularly interesting. Graphene oxide features a 10 nm scale, allowing it to adhere to membrane channels that allow passive ion movement. Figure 4b shows the delivery methods of the nano-transducers. The most obvious are the intranasal route (which is related to the rods to perform PCR tests for the detection of c0r0n @ v | rus) and the intravenous route (which is directly related to the administration of vaccines against c0r0n @ v | rus).

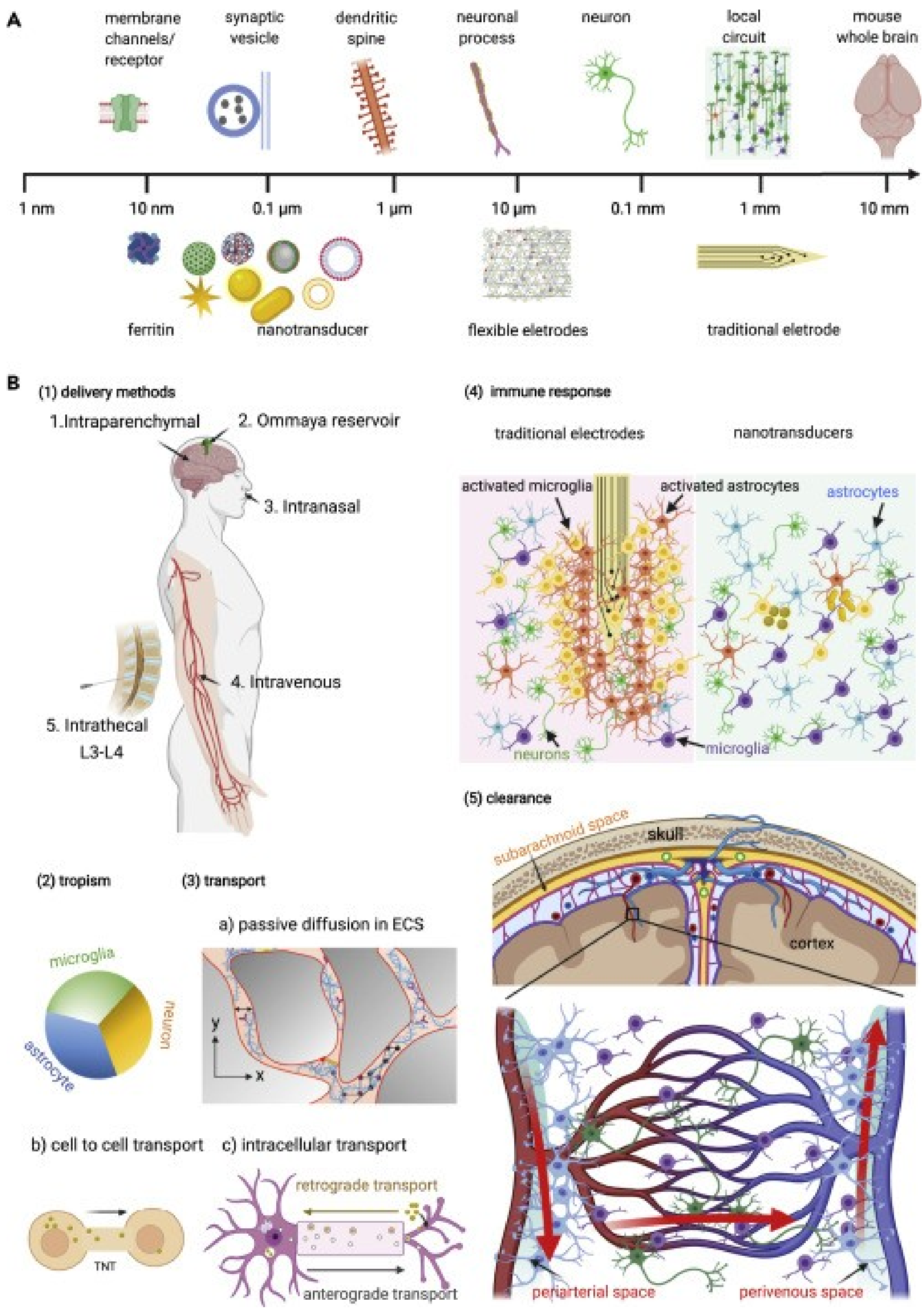

Fig. 4. Scale of nano-transducers and their administration in the human body

In figure 5, the modulation schemes and the elements or factors involved in transduction are shown. Section a and b of figure 5 is very noteworthy, where it is shown how electromagnetism and terminal modulation directly affect the emission of signals with which to control neuronal functioning and with high probability their mood and behavior patterns. Graphene is present in Figure 5B as a 2D hexagonal pattern structure.

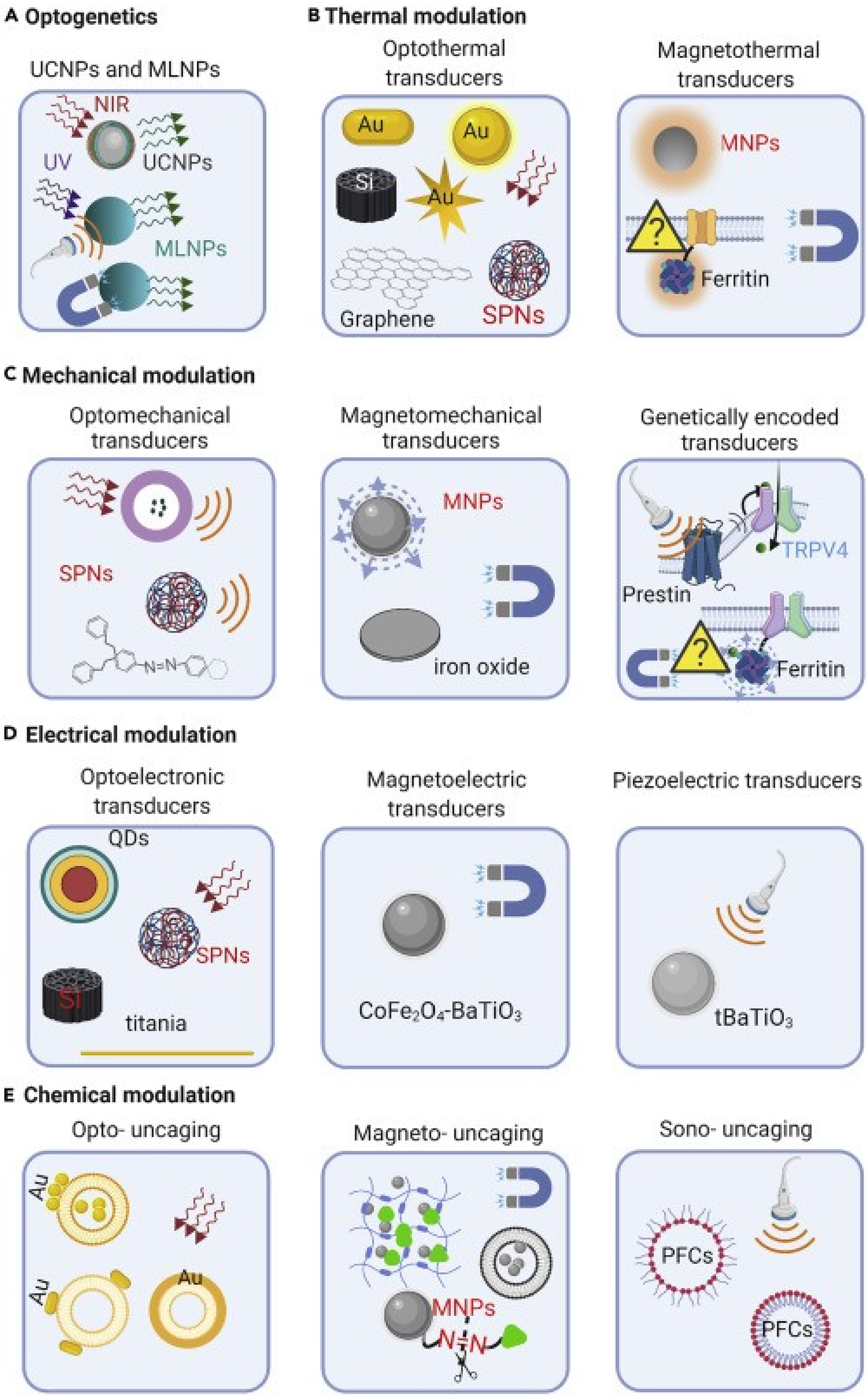

Fig. 5. Types of modulation, their nano-transducers, signals, stimuli and charges

Figure 6 shows some important details, relative to the stimuli sent to the nano-transducers located in the brain. If the electromagnetic signal is observed in figure 6b, according to the authors, it could reach a penetration of 3.5 mm (it is assumed, starting from the pia mater (one of the layers that covers and protects the brain). has verified in the scientific literature (Mendonça, MCP; Soares, ES; de Jesus, MB; Ceragioli, HJ; Ferreira, MS; Catharino, RR; da Cruz-Höfling, MA 2015) and in previous entries, graphene oxide can penetrate the entire brain, given its scale that crosses the. blood-brain barrier.

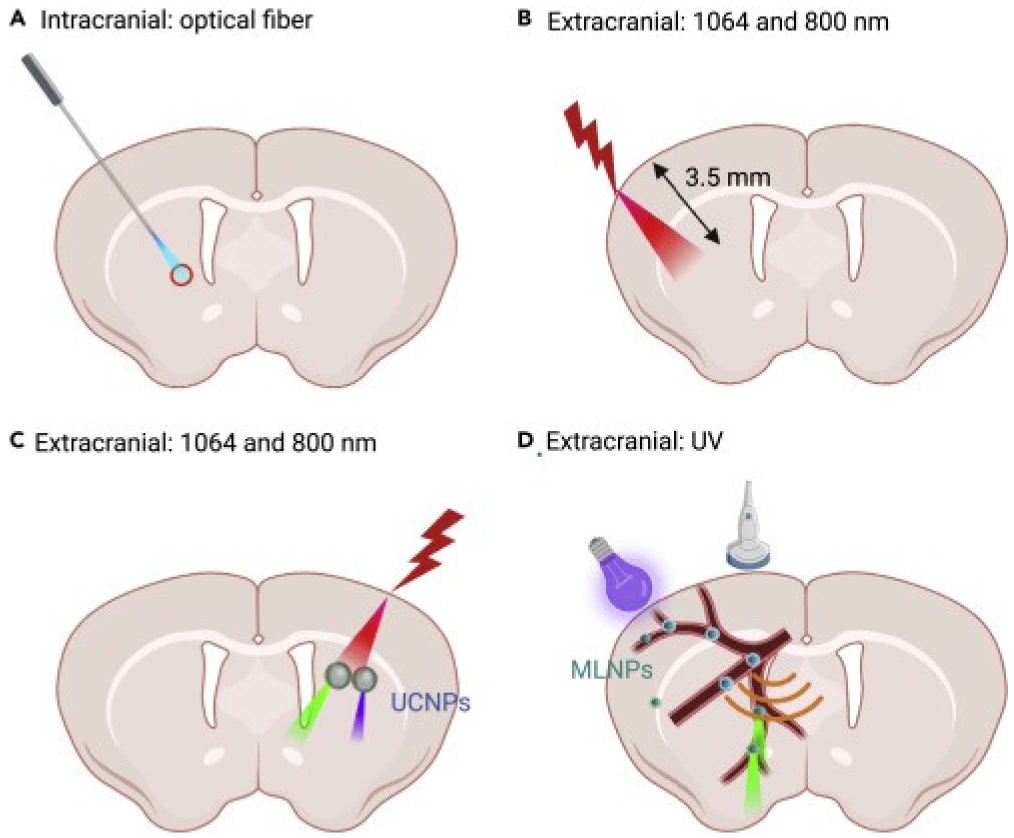

Fig. 6. Brain modulation methods

Other important details are the allusion to heat, magnetic forces (already clarified above) and ROS (reactive oxygen species, which are free radicals, oxygen ions and peroxides) responsible for oxidation and the REDOX imbalance, already explained in the entry on the role of graphene oxide on mitochondrial homeostasis . It is also relevant to mention the reactions by ultraviolet light and ultrasound, which are similarly represented in Figure 7.

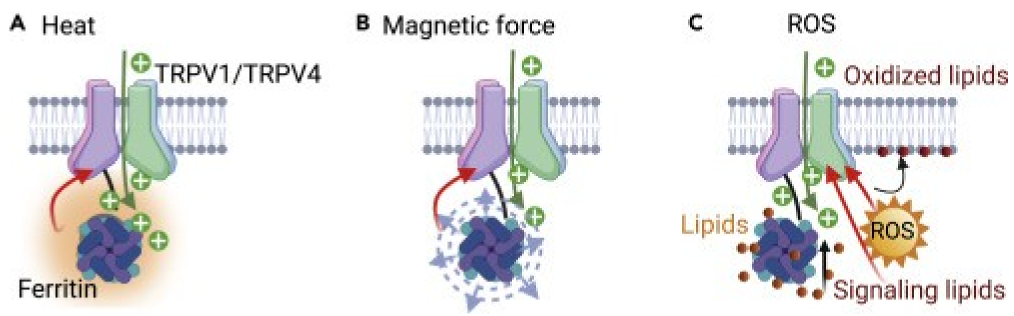

Fig. 7. Heat, magnetic forces and ROS

4. Regarding the references cited by the article analyzed in this entry, it is worth highlighting a great bibliographic wealth (more than 140 works consulted). Due to their extension, the most relevant ones have been selected for review due to their relationship with graphene oxide and EM thermal or electromagnetic neuromodulation, as well as those neurotransmitters that can influence the thinking, behavior and functioning of the brain synapse of a person. In this section, there are 5 references related to dopamine regulation / modulation, see (Beyene, AG; Delevich, K.; Del Bonis-O'Donnell, JT; Piekarski, DJ; Lin, WC; Thomas, AW; Landry, MP 2019 | Sun, F.; Zhou, J.; Dai, B.; Qian, T.; Zeng, J.; Li, X.; Li, Y. 2020 | Sun, F.; Zeng, J.; Jing, M.; Zhou, J.; Feng, J.; Owen, SF; Li, Y. 2018 | Patriarchi, T.; Mohebi,TO .; Sun, J .; Marley, A .; Liang, R .; Dong, C .; Tian, L. 2020 | Patriarchi, T .; Cho, JR; Merten, K .; Howe, MW; Marley, A .; Xiong, WH; Tian, L. 2018). Dopamine is a neurotransmitter that allows communication between neurons and is considered to be responsible for the sensations of pleasure, relaxation, happiness and is closely related to addiction, impulsivity in people, as well as dependence and the feeling of reward. (Koob, GF 1992). This is very important, because it means that with a very high probability, graphene oxide nano-transducers could modulate the generation of dopamine. In fact, it has been shown that graphene oxide is capable of adsorbing dopamine, see figure 8 and reference from (Ren, H.; Kulkarni, DD; Kodiyath, R.; Xu, W.; Choi, I.; Tsukruk, VV2014). They discovered that depending on the application temperature,the graphene nanostructure could adsorb rhodamine6G and dopamine, allowing the development of biosensors. This fits perfectly with the operation of the thermally modulating nano-transducers, explained above. Consequently, the ability of the graphene oxide nanotransducer to regulate the dopamine emitted by the brain, based on 5G electromagnetic neuromodulation, seems feasible. All of this means that a person inoculated with graphene oxide would have nano-transducers that could This fits perfectly with the operation of the thermally modulating nano-transducers, explained above. Consequently, the ability of the graphene oxide nanotransducer to regulate the dopamine emitted by the brain, based on 5G electromagnetic neuromodulation, seems feasible.All of this means that a person inoculated with graphene oxide would have nano-transducers that could This fits perfectly with the operation of the thermally modulating nano-transducers, explained above. Consequently, the ability of the graphene oxide nanotransducer to regulate the dopamine emitted by the brain, based on 5G electromagnetic neuromodulation, seems feasible. All of this means that a person inoculated with graphene oxide would have nano-transducers that could penetrate the blood-brain barrier BBB and act according to the signals emitted by electromagnetic waves, to infer the mechanisms of conditional behavior, similar to those described in the Pavlov experiment, read (Bitterman, ME 2006).

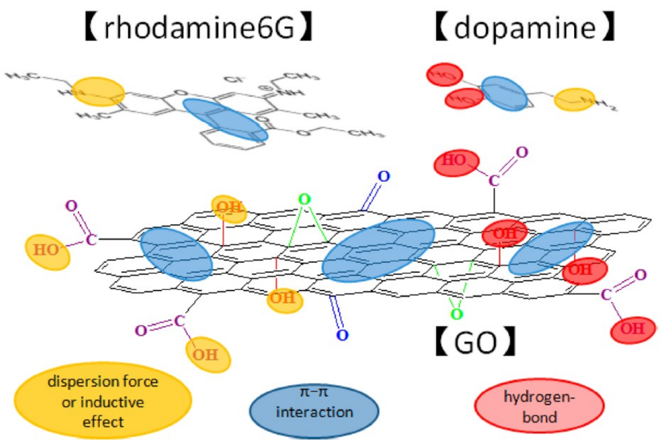

Fig. 8. Dopamine adsorption on GO graphene oxide nanofilms

5. Regarding the references cited by the authors regarding graphene, it is worth mentioning the work of (Rastogi, SK; Garg, R .; Scopelliti, MG; Pinto, BI; Hartung, JE; Kim, S .; Cohen-Karni, T. 2020) which deals with remote " non-genetic " optical modulation of neuronal activity, by means of diffuse graphene nanostructures. In this work we experiment with the NT-3DFG or what is the same (Nanowire-Templated-3D Fuzzy Graphene) which are diffuse graphene 3D tempered nano-networks, which in simple terms are overlapping graphene structures, see figure 9a. It is also observed how figure 9d is very similar to the RD1 sample analyzed by (Campra, P. 2021)

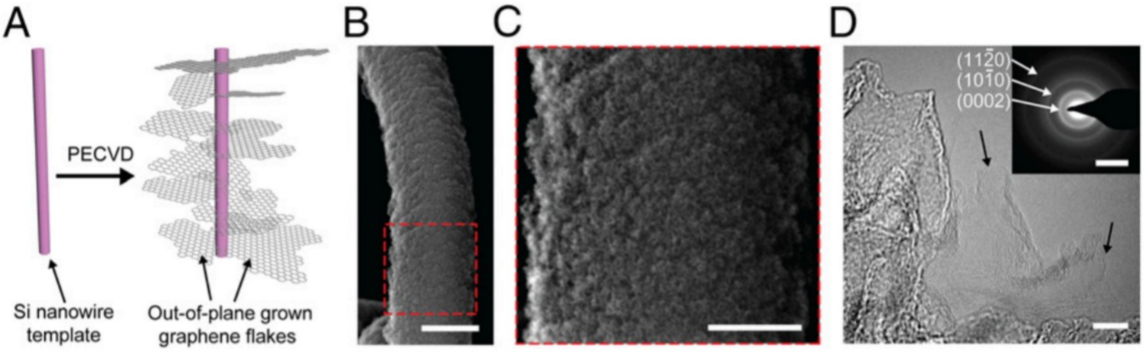

Fig. 9. Preparation of the NT-3DFG material in table A

Figure 10 shows how the NT-3DFG nanomaterial acts as a neuronal interface, or what is the same "nanotransducer", which admits laser pulses of reduced duration in a range of 2 to 5 ms.

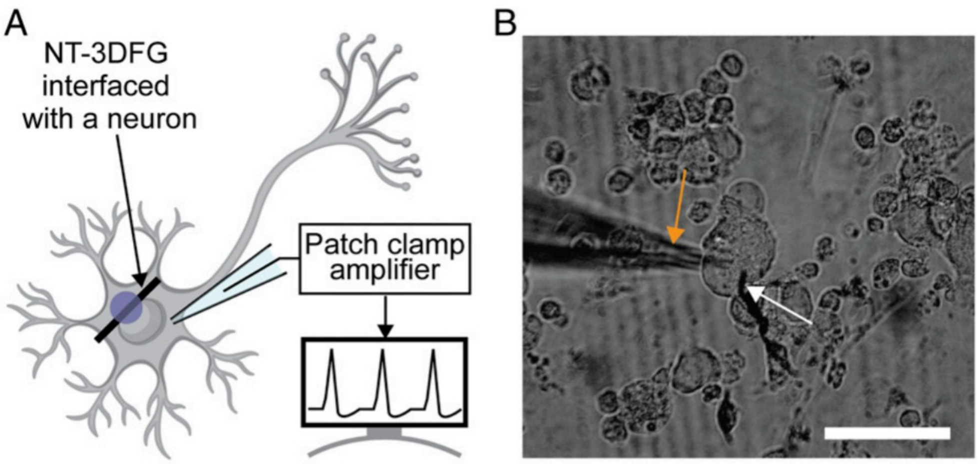

Fig. 10. NT-3DFG acting on the neuron

5. Finally, there is the article by (Hernández-Morales, M.; Shang, T.; Chen, J.; Han, V.; Liu, C. 2020) that provides fundamental keys to understand how RF radio frequency waves " *activate ferritin -labeled channels through a biochemical pathway* , "increasing free iron levels. This could explain the magnetic effects of vaccines against c0r0n @ v | rus. The authors also state " *Free iron produces reactive oxygen species and oxidizes membrane lipids* " which reinforces the idea of the REDOX imbalance, already discussed above .

Reviews

1. For all the facts presented, it can be affirmed that graphene oxide can act as a nanotransducer controlled by electromagnetic waves compatible with 5G, to infer neuronal behavior, altering the functioning of microglia, dopamine and other neurotransmitters.
2. Wireless remote neuromodulation can influence dopamine-regulated conditioning, happiness, reward, addiction and dependence mechanisms through thermal modulation, according to the principles discussed and referred to.
3. Therefore, people inoculated with graphene oxide de facto carry nano-transducers, which with a very high probability penetrate the blood-brain barrier (Perini, G.; Palmieri, V.; Ciasca, G.; De Spirito, M.; Papi, M. 2020) and are deposited in neuronal cells (this is so, due to the chemical and morphological characteristics of the material used). Once deposed in cells, graphene oxide can cause damage , adverse effects and activate for the neuromodulation of electromagnetic waves.
4. It can be concluded that neuronal / brain / mental control or modulation with graphene oxide inoculated through the c0r0n @ v | rus vaccines using electromagnetic waves is perfectly feasible.

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