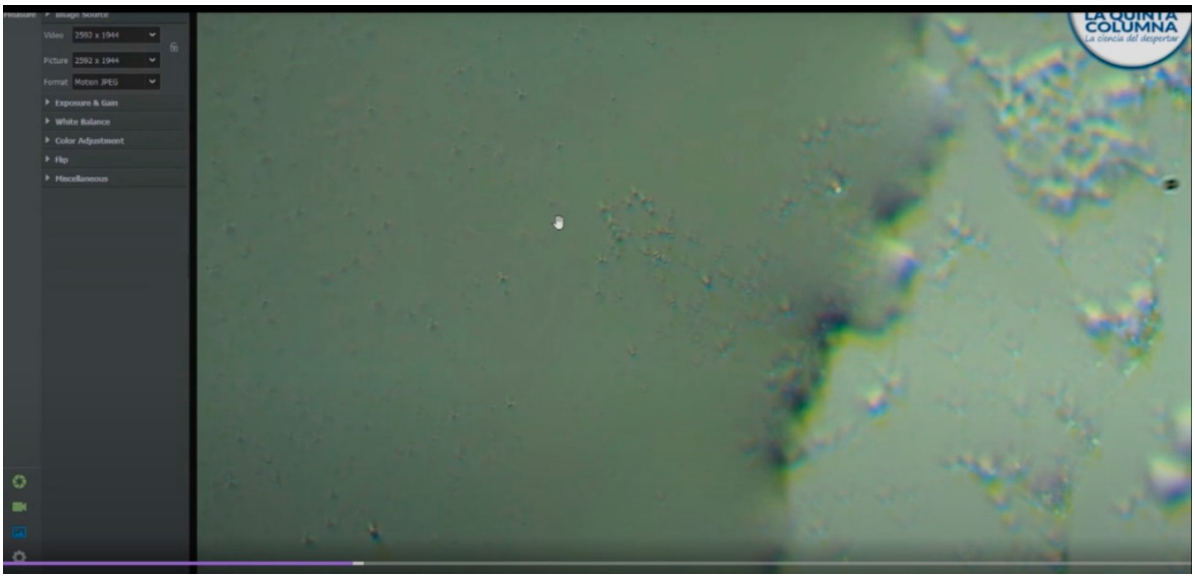
C0r0n@ 2 Inspect

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, January 3, 2022

Identification of patterns in c0r0n @ v | rus vaccines: Signs of DNA-Origami self-assembly.

One of the most difficult aspects to determine in the identification of patterns of c0r0n@v|rus vaccines is the method or procedure by which the objects observed (micro/nano-routers, micro/nano-rectenas...) have been formed. In the scientific literature there have been many works that pointed to various production techniques, such as electron lithography, focused ion beam FIB and even synthetic DNA templates, with which the QCA circuits of the nanorouters would be defined. However, no clear evidence of self-assembly could be found in the vaccine samples. However, the more than well-founded suspicions of this process were confirmed with the observation of the video produced by Ricardo Delgado on December 27, 2021, which showed the movement of thousands of particles in a sample of the Pfizer vaccine. These particles appeared to coalesce to form more complex structures, defining simple geometric patterns, see excerpt in the following video 1.



Video 1. Self-assembly observed in a Pfizer vaccine sample. Original source: https://www.twitch.tv/videos/1245191848?t=00h34m56s (Delgado, R. 2021) English translation: https://rumble.com/vrinm1-real-time-observation-of-the-content-of-a-pfizer-vaccine-vial.html?mref=lveqv&mc=48pz1

In the scientific literature, this quasi-directed behavior or movement of particles, in the context of the construction of micro/nano electronic objects and devices in an intracorporal communication nano-network, had high probabilities of corresponding to a self-assembly process based on DNA, epitaxial growth and origami. This deduction resulted in the location of the scientific articulate that, with high probability, could confirm the self-assembly of complex objects, including circuits, boards, routers, sensors and other micro/nano electronic components and devices. This discovery

explains how the components responsible for the bluetooth MAC address broadcasting phenomenon would self-assemble (Sarlangue, G.; Devilleger, J.; Trillaud, P.; Fouchet, S.; Taillasson, L.; Catteau, G. 2021). It would also explain the assembly of nano-devices, nano-sensors, nano-nodes, micro/nano-interfaces, micro/nano-routers, micro/nano-antennas, micro/nano-rectennas, with which the hardware of the intra-corporal nano-communications network is configured.

Figure 1 shows the signs of self-assembly observed in the scientific literature and their correspondence with the analyzed samples of the Pfizer vaccine. From a morphological point of view, there are important coincidences that allow us to infer and almost assume that self-assembly is a verifiable reality.

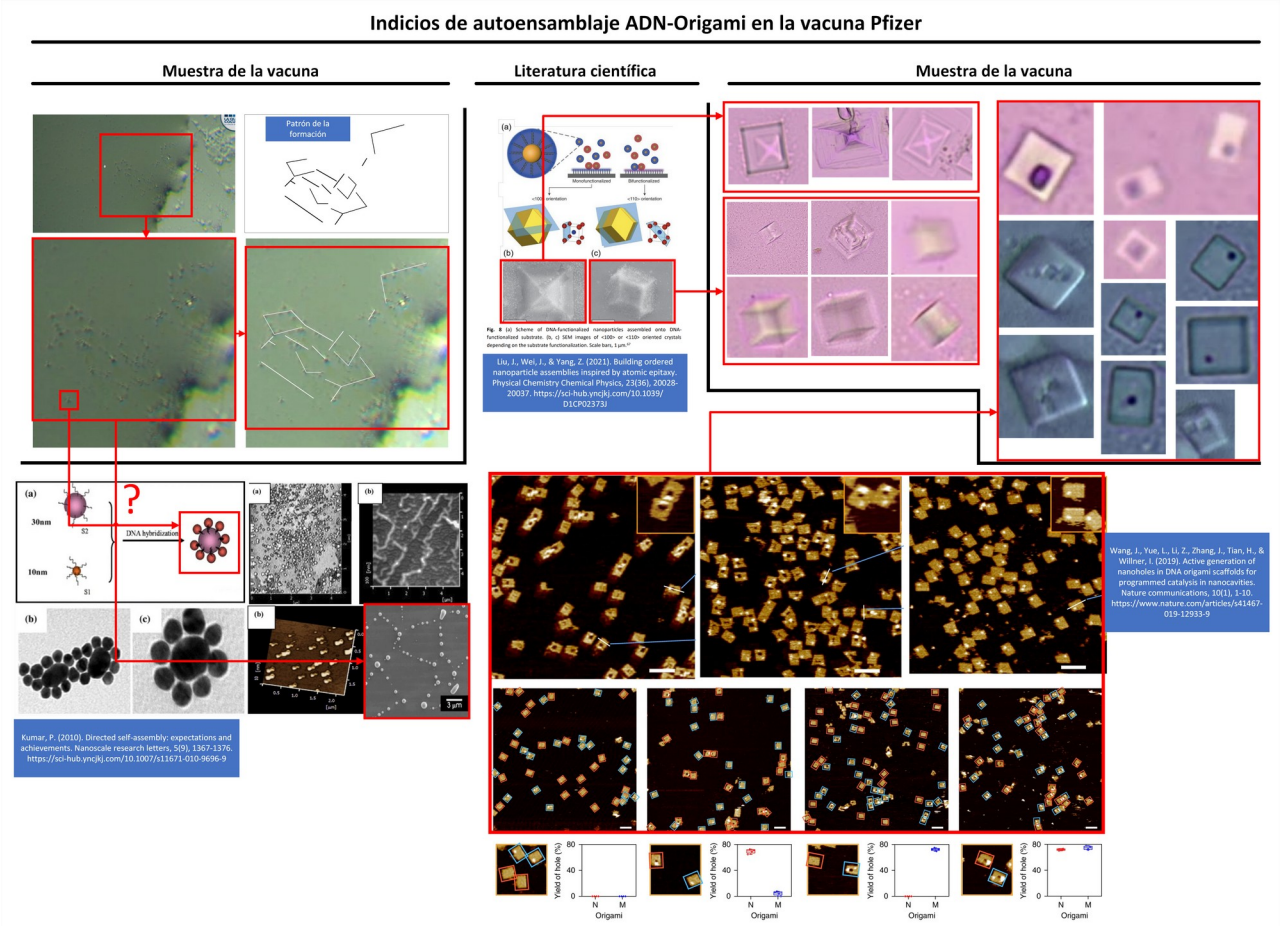


Fig.1. Signs of DNA-Origami self-assembly in the Pfizer vaccine.

Due to the complexity of the subject of self-assembly, as well as the relevance of the evidence discovered, we will proceed to a detailed analysis of the subject under three main headings: a) directed self-assembly; b) self-assembly by means of soft epitaxial growth; c) origami self-assembly.

Directed self-assembly

The article by (Kumar, P. 2010) presents the first clear indication of "*directed self-assembly*" that can be observed in the vaccine sample, see figure 2 and video 1. The observed nanoparticles appear to coalesce into larger clusters and thus more complex structures that move in the sample droplet.

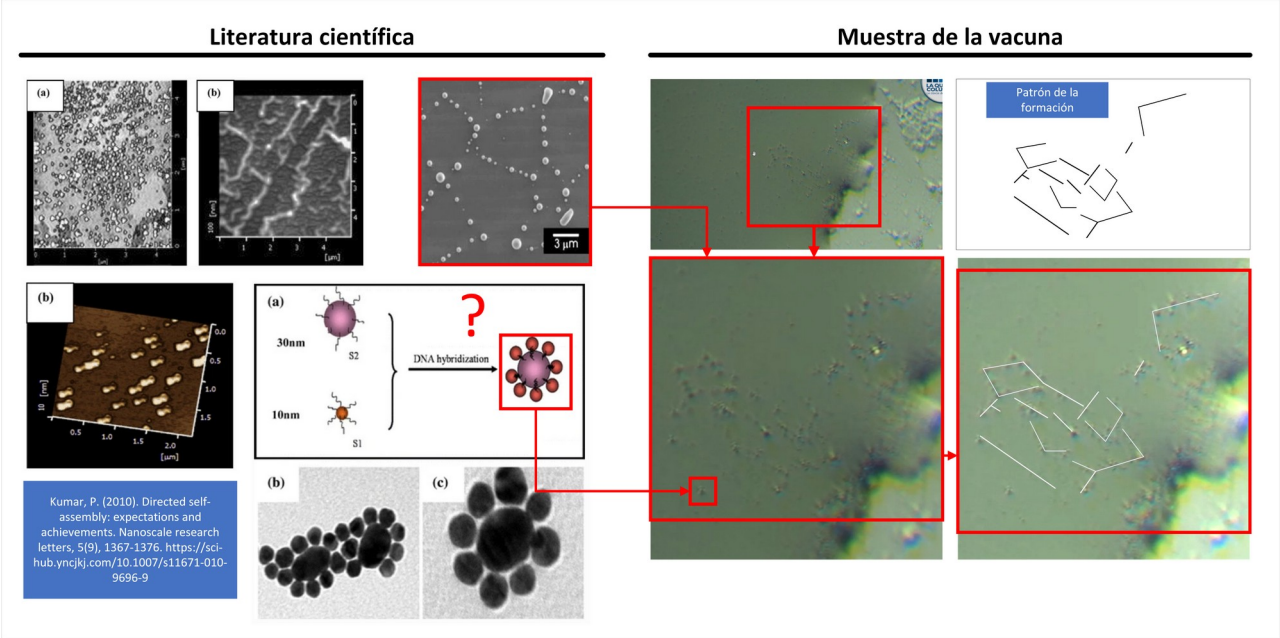


Fig.2. The vaccine sample shows particles with apparent self-assembly movement, raising suspicion that the hybridized DNA technique for directed self-assembly is being employed. (Kumar, P. 2010)

According to (Kumar, P. 2010), directed self-assembly is key to the development of miniaturized electronic, magnetic and optical devices, which fits with the graphene-derived materials found in the vaccine samples, in fact it is stated that "*nanoparticles have attracted great attention as such components due to their unique size-dependent properties, which include super-paramagnetism, chemiluminescence and catalysis. To take full advantage of the potential capabilities of nanoparticles, we need to develop new methods to assemble them into useful patterns or structures. These self-assembled structures promise new opportunities for developing miniaturized optical, electronic, optoelectronic and magnetic devices*."

On the other hand, Kumar reveals that the "*directed self-assembly*" method is well suited for generating nano- and micro-scale devices because of its ability to use quantum dots or nanodots. He explains it as follows "*as the device size or functions become smaller and smaller, conventional lithographic processes prove to be limited for their production. Alternative methods need to be developed to circumvent this difficulty. As conventional manufacturing technologies, such as optical lithography, are developed, they also begin to run up against fundamental limits.... In addition, new manufacturing techniques are required to help extend both the useful life and the range of application of existing techniques.... The directed self-assembly technique can be appropriately employed to produce functional nanostructures, e.g., nanowires and an organized array of nano-dots (meaning quantum dots)*." In other words, "*directed self-assembly*" allows the quantum dots of a given material (e.g. graphene GQD Graphene Quantum Dots) to self-assemble according to a predefined pattern.

Among the possible types of directed or guided self-assembly, Kumar recognizes "*template-guided assembly where they use atomic surface patterns; electromagnetic field or electric field guided assembly, by electron beam, light and laser, among others*." He further acknowledges that "*directed self-assembly is a reproducible and robust technique with future prospects for industrial-scale use...which means building well-ordered, often intriguing structures, which has received much attention for its facility to organize materials at the nanoscale into ordered structures and produce large-scale complex structures*." This appears to be critical in the context

of the intra-corporal network of nanocommunications and nano/micro devices, as thousands of devices must be created for their operation (Zhang, R.; Yang, K.; Abbasi, Q.H.; Qaraqe, K.A.; Alomainy, A. 2017 | Galal, A.; Hesselbach, X. 2018 | Galal, A.; Hesselbach, X. 2020).

Among all forms of self-assembly, the most likely and most morphologically matched is self-assembly guided by biological DNA templates. Among its advantages, Kumar highlights "*nanowire fabrication as it solves integration problems (eliminating the need to manipulate individual nanowires). Problems related to contacts for electrical and magnetic transport are also solved*." This fits with the type of nanodevices observed, e.g. micro/nano rectennas and graphene-derived materials, graphene quantum dots GQDs. In fact, Kumar states that "*the use of physical DNA templates, results in the growth of nanomaterials in a predefined position, eliminating the need for post-growth manipulation and providing the facility of electrical connections for further characterizations*," which helps to understand how the quadrangular shapes observed in the vaccine samples are constructed and defined, bearing a strong resemblance to PCBs, microchips, sensors and integrated circuits. He also adds that "*such templates give rise to the growth of nanopoints (quantum dots), vertical nanowires, which can be used in a controllable way to fabricate FET (Field Effect Transistor) devices, magnetic tunnel junction devices and devices for optical applications*" which confirms that with directed self-assembly it is possible to create miniaturized nanotechnology of any known electronic device. In other words, self-assembly guided by biological DNA templates can be used to make all the devices required for an intracorporal nano-network, being feasible that this is the technique used in vaccines, according to the images observed and the statements in the scientific literature (Catania, V. Mineo, A.; Monteleone, S.; Patti, D. 2014 | Keren, K.; Berman, R.S.; Buchstab, E.; Sivan, U.; Braun, E. 2003).

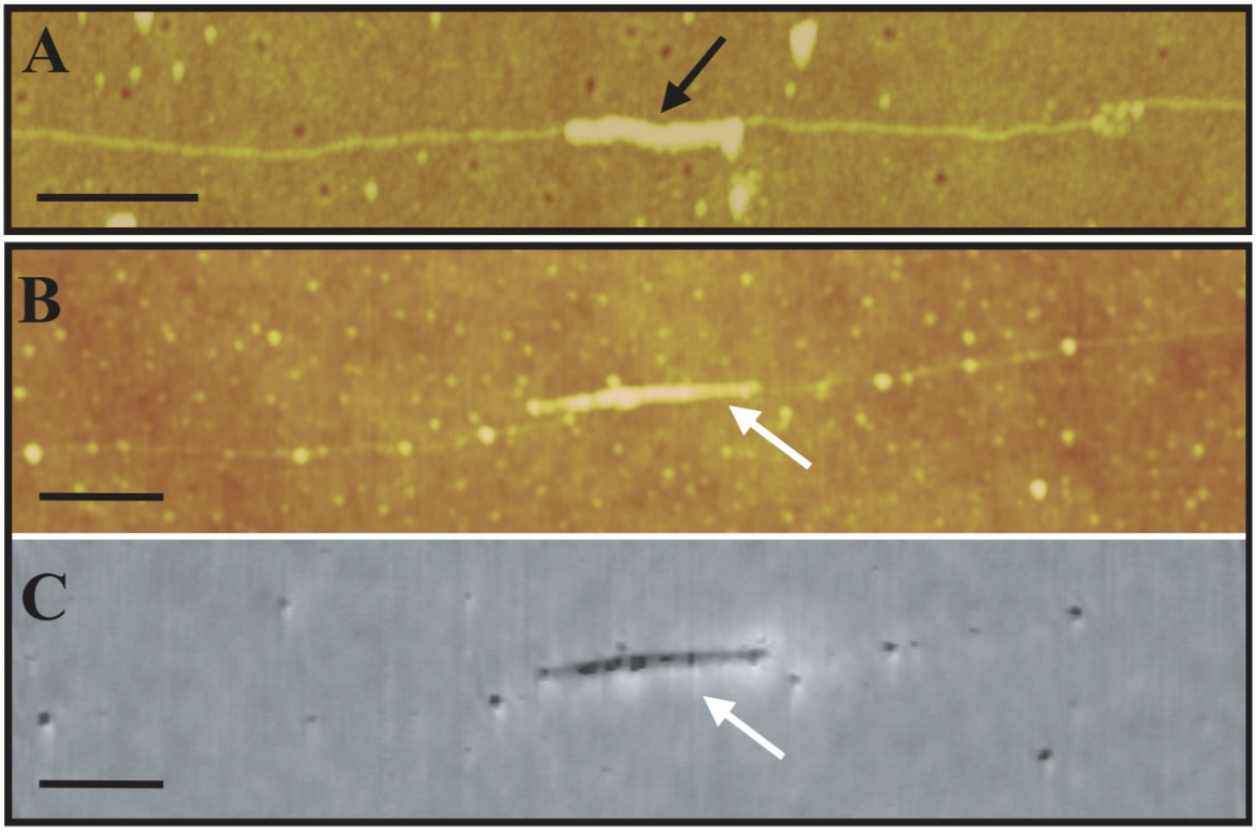


Fig.3. Carbon nanotube FET field effect transistor with DNA template. (Keren, K.; Berman, R.S.; Buchstab, E.; Sivan, U.; Braun, E. 2003).

Kumar further notes that "*biomolecule-directed strategies (biological DNA templates) have shown great promise in the assembly of nanoparticles in a wide diversity of architectures, due to their high efficiency, high specificity and genetic programmability (McMillan, R.A.; Paavola, C.D.; Howard, J.; Chan, S.L.; Zaluzec, N.J.; Trent, J.D. 2002). These nanoassembled materials have been shown to have potential applications in novel sensing systems, such as biosensors (Taton, T.A.; Mirkin, C.A.; Letsinger, R.L. 2000) and chemical sensors (Liu, J.; Lu, Y. 2003 | Liu, J.; Lu, Y. 2006), and in the construction of nanoelectronic devices (Keren, K.; Berman, R.S.; Buchstab, E.; Sivan, U.; Braun, E. 2003) [paradoxically configured with carbon nanotubes]*" Which reconfirms that it is a convenient technique/method in the implementation of nanotechnology in the human body.

Self-assembly by soft epitaxial growth

If the indications of directed self-assembly can be considered as perfectly well-founded hypotheses, "*self-assembly by soft epitaxial growth*" presents even more evident evidence. Figure 4 shows an exact equivalence between the scientific literature and the Pfizer vaccine samples analyzed by the doctor (Campra, P. 2021). Some of the more numerous quadrangular and pyramidal shaped objects would actually be the result of an epitaxial self-assembly technique, which is in fact, "*one of the processes of integrated circuit fabrication*" (Shen, J.; Sun, W.; Liu, D.; Schaus, T.; Yin, P. 2021 | Burns, M.A.; Mastrangelo, C.H.; Sammarco, T.S.; Man, F.P.; Webster, J.R.; Johnsons, B.N.; Burke, D.T. 1996 | Esener, S.C.; Hartmann, D.M. Heller, M.J.; Cable, J.M. 1998 | Krahne, R.; Yacoby, A.; Shtrikman, H.; Bar-Joseph, I.; Dadosh, T.; Sperling, J. 2002 | Chen, Y.; Pepin, A. 2001). Epitaxy refers to the deposition of a layer of material (e.g. graphene quantum dots, graphene oxide, hydrogel, etc.) on a primary nucleation substrate. However, unlike traditional growth processes, in this case it is achieved by DNA hybridization. It is at this point, where (Liu, J.; Wei, J.; Yang, Z. 2021) develops one of the objects of their research.

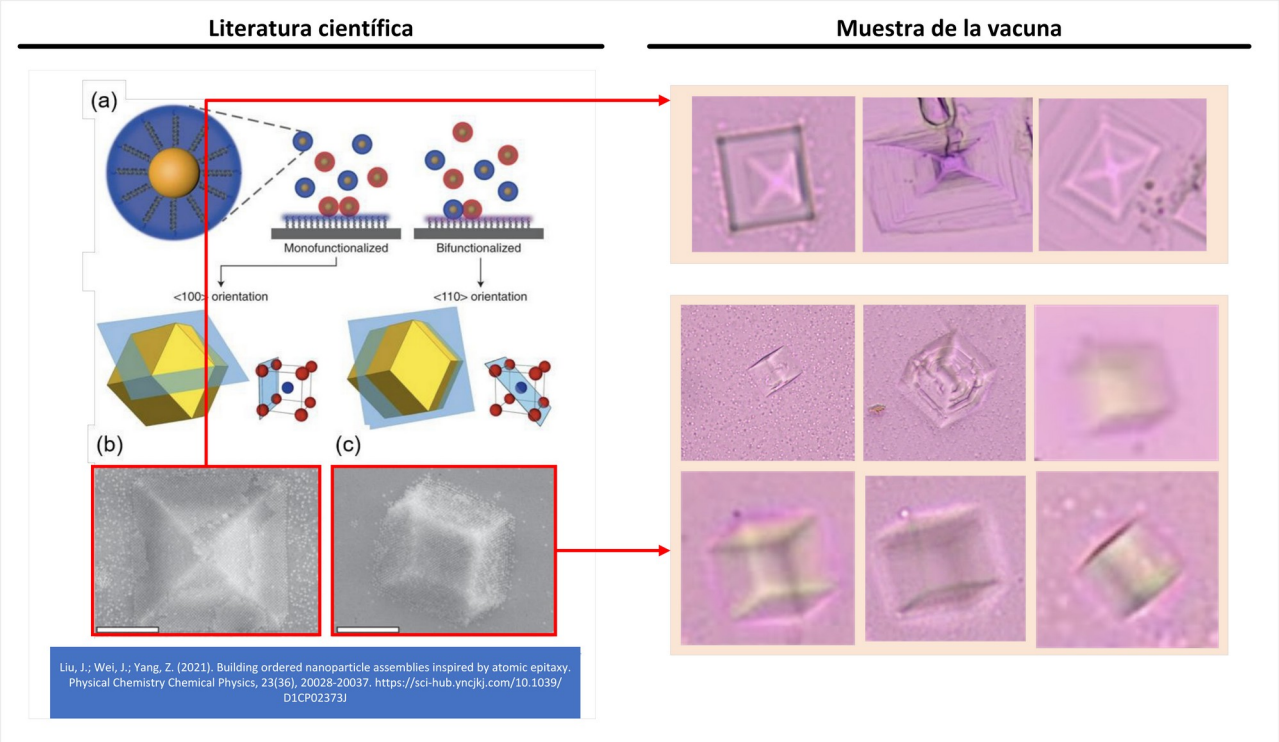


Fig.3. Nano-rectenna formed by multi-walled carbon nanotubes encapsulated in a sandwich of metallic nanomaterials. (Sharma, A.; Singh, V.; Bougher, T.L.; Cola, B.A. 2015)

According to (Liu, J.; Wei, J.; Yang, Z. 2021) the self-assembly of "*inorganic nanoparticles into mesoscopic or macroscopic nanoparticle assemblies is an efficient strategy to fabricate advanced devices with emerging nanoscale functionalities. In addition, assembly of nanoparticles on substrates can enable the fabrication of substrate-integrated devices, similar to the growth of atomic crystals on a substrate. Recent progress in nanoparticle assembly suggests that ordered nanoparticle assemblies could be produced well on a selected substrate, known as soft epitaxial growth*." This definition comes to confirm that the fabrication of micro/nano electronic devices (integrated circuits) can be accomplished by guided crystal growth on a DNA substrate or template. This is evident from the following explanation "*DNA hybridization has been applied to assemble nanoparticles into superlattices with crystal structures that are surprisingly rich. The three-dimensional double helix structure of DNA (fixed pitch, fixed diameter) was found to have more advantages than other materials in guiding nanoparticles into ordered three-dimensional assembly (Nykypanchuk, D.; Maye, M.M.; Van-Der-Lelie, D.; Gang, O. 2008). The specific recognition between base pairs and the ability to control DNA strand length and base sequence make it a powerful weapon for nanoscale assembly. DNA's programming ability makes it an extremely attractive structure-oriented ligand*." This confirms that self-assembly using DNA not only allows the construction of 2D structures, since 3D structures can be generated thanks to the DNA double helix bonds, allowing it to be used to configure all kinds of shapes, including the cubic and prismatic ones seen in Figure 4.

Among the experiences cited by (Liu, J.; Wei, J.; Yang, Z. 2021) the following paragraph on epitexial self-assembly is noteworthy, in which extensive experience in experimenting with DNA-based crystalline constructs is unveiled, with an error (mismatch) tolerance of as little as 1%.

> *"According to (Lewis, D.J.; Zornberg, L.Z.; Carter, D.J.; Macfarlane, R.J. 2020) and co-workers used this technique and a combination of DNA-functionalized nanoparticles and a DNA strand-functionalized substrate to design an epitaxial assembly process. They found that single-crystal Winterbottom forms of nanoparticle crystals are formed by controlling the interfacial energies between crystals and fluid, substrate and crystal, and substrate and fluid. Other examples show that self-assembled DNA grafted nanoparticles in two-dimensional colloidal films can be applied as a substrate for soft epitaxial assembly. For example, according to (Wang, M.X.; Seo, S.E.; Gabrys, P.A.; Fleischman, D.; Lee, B.; Kim, Y.; Mirkin, C.A. 2017) they used DNA-coated nanoparticles as more elastic and malleable building blocks to better accommodate lattice mismatch. Further studies (Gabrys, P.A.; Seo, S.E.; Wang, M.X.; Oh, E.; Macfarlane, R.J.; Mirkin, C.A. 2018) showed that superlattice thin films assembled by DNA-functionalized nanoparticles can store elastic strains upon deformation and reorganization, with lattice mismatches of up to ± 7.7%, significantly exceeding the ± 1% lattice mismatches allowed by atomic thin films. Importantly, these DNA-coated nanoparticles undergo progressive and coherent relaxation, dissipating strain elastically and irretrievably through the formation of dislocations or vacancies. Therefore, it is possible to grow heteroepitaxial colloidal films by controlling programmable atomic equivalents - soft - nanometer and microstructures using rigid nanocrystals coated with soft compressible polymeric materials."* (Liu, J.; Wei, J.; Yang, Z. 2021)

Origami self-assembly

Finally, among the most original forms of self-assembly is the "*origami method*", also linked to

the use of DNA templates. In this case, clues are found in the work of (Wang, J.; Yue, L.; Li, Z.; Zhang, J.; Tian, H.; Willner, I. 2019) entitled "Active generation of nanoholes in DNA origami scaffolds for programmed catalysis in nanocavities". The pattern of a dot or hole within a quadrangular structure, is striking and characterizing from a morphological point of view. This detail was found in the images obtained by Dr. Campra, which together with the self-assembly object of study, allowed us to infer that it was another piece of the puzzle and that in reality, there must be larger objects self-assembled with the origami method. The similarities are clear and evident, see Figure 5, since the quadrangular structure of the objects, the position of the nano-holes inscribed within the surface, as well as the number or quantity of them observed in the samples of the Pfizer vaccine coincide.

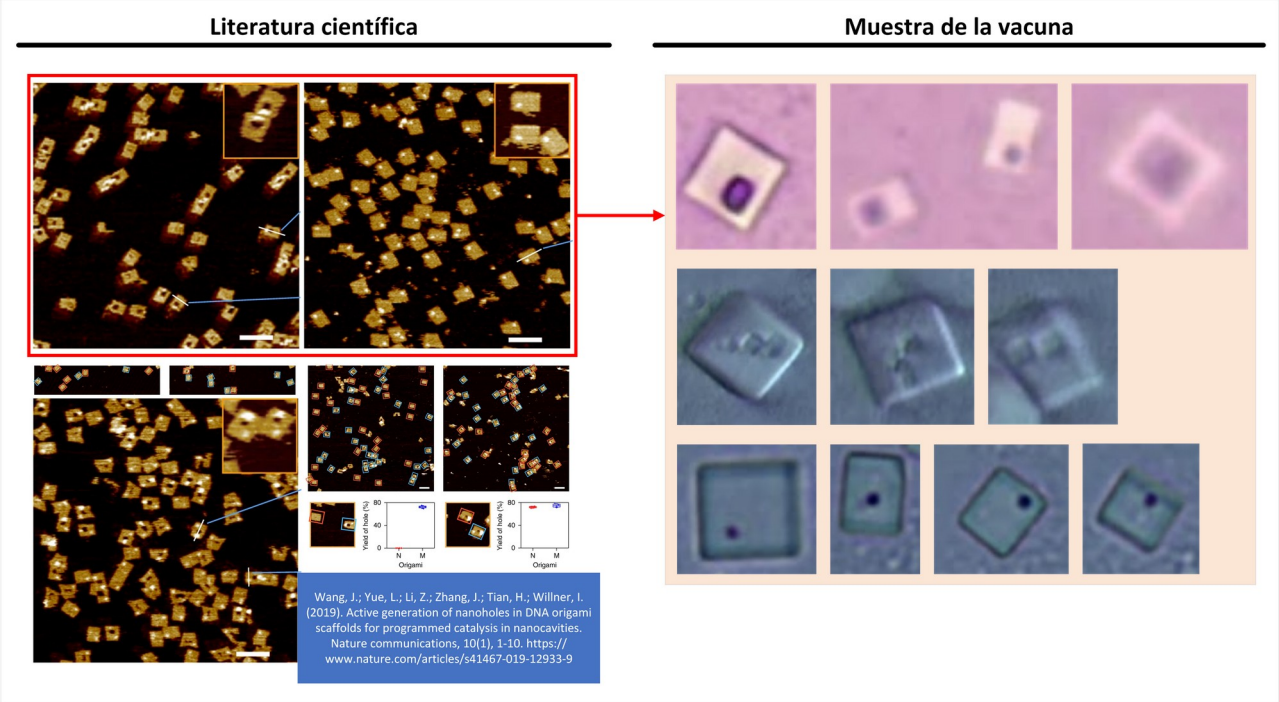


Fig.5. It is observed that the objects observed in the Pfizer vaccine samples have direct correspondence with the scientific literature regarding origami self-assembly, where nano-holes are unambiguous characteristic elements. (Wang, J.; Yue, L.; Li, Z.; Zhang, J.; Tian, H.; Willner, I. 2019)

But, before proceeding to analyze the issue of holes in quadrangular objects, it is worthwhile to review the introduction and state of the art provided by the authors in their paper, as it helps to situate the capabilities of the technique and demonstrate its linkage to the nanotechnology used in vaccines. Indeed surprising claims are noted, as origami self-assembly is a "*programmed assembly of two-dimensional (2D) and three-dimensional (3D) DNA nanostructures, representing a major breakthrough in DNA nanotechnology*" (Hong, F.; Zhang, F.; Liu, Y.; Yan, H. 2017 | Rothemund, P. W. 2006 | Endo, M.; Sugiyama, H. 2014), which confirms not only the possible dimensions or axes of self-assembly, but also that the origami method is compatible with soft epitexial growth self-assembly and thus with directed or guided self-assembly. In all cases, the use of synthetic DNA structures, suitably configured, are the necessary precursors for the development of the structures and objects observed in the vaccine samples.

Furthermore, (Wang, J.; Yue, L.; Li, Z.; Zhang, J.; Tian, H.; Willner, I. 2019) confirm that the origami self-assembly method using DNA, allows the anchoring of components to configure, among other devices, plasmonic antennas, previously identified in the vaccine samples as part of the human body-centered nano-network. This is stated in the following verbatim quote: "*in*

addition to creating ingenious shapes of origami structures generated by programmed DNA folding, the origami structures were functionalized with protruding nucleic acid strands, or oligonucleotide strands with modified edges. The protruding strands were used as anchor sites for the organization of polymers, proteins and nanoparticles in the scaffolds of each origami. Unique functions of the nanostructures assembled on the origami scaffolds were demonstrated, such as the functioning of enzyme cascades, the design of plasmonic antennae, and the assembly of chiroplasmonic structures." This explanation is fundamental to understand the process of formation of superstructures, guided by DNA patterns, as they are linked through the strands protruding from the building blocks, functionalized with nanoparticles (e.g. graphene quantum dots), which together with the scale factor and superconductor of the material, provide plasmonic characteristics, and quantum hall, which implies the self-assembly of transistors, and micro/nano chips of the required complexity.

In their introduction, (Wang, J.; Yue, L.; Li, Z.; Zhang, J.; Tian, H.; Willner, I. 2019) also provide interesting annotations and citations on the possibilities of the origami technique and the design of DNA walkers with motor capabilities to initiate motion, turn and stop, according to molecular interaction patterns. In fact, according to (Lund, K.; Manzo, A.J.; Dabby, N.; Michelotti, N.; Johnson-Buck, A.; Nangreave, J.; Yan, H. 2010) these DNA walkers, are in essence molecular robots guided by substrate molecules (precursors) in a set of DNA origami structures (templates). This is confirmed in the following full-text quote from Lund, corroborated also by (Omabegho, T.; Sha, R.; Seeman, N.C. 2009 | Gu, H.; Chao, J.; Xiao, S.J.; Seeman, N.C. 2010):

> "*Moving robotics to the single-molecule level is possible a priori, but requires facing the limited capacity of single molecules to store complex information and programs. One strategy to overcome this problem is to use systems that can derive complex behaviors from the interaction of simple robots with their environment. A first step in this direction was the development of DNA walkers, which have gone from being non-autonomous to being able to perform directed but brief movements on one-dimensional tracks. In this work we demonstrate that random walkers, also called molecular spiders comprising a streptavidin molecule as an inert -body- and three deoxyribozymes as catalytic -legs-, show elementary robotic behavior when interacting with a precisely defined environment. Single-molecule microscopy observations confirm that these walkers achieve directional movement by detecting and modifying the tracks of substrate molecules arranged in a two-dimensional DNA origami landscape*" (Lund, K.; Manzo, A.J.; Dabby, N.; Michelotti, N.; Johnson-Buck, A.; Nangreave, J.; Yan, H. 2010).

This may confirm the presence of molecules and parts with the capacity for self-assembly, their movement, orientation and self-organization, to configure complex electronic devices, conforming to synthetic DNA patterns and templates, which are more proximal in a vaccine-like solution, as suggested by the observation in Video 1.

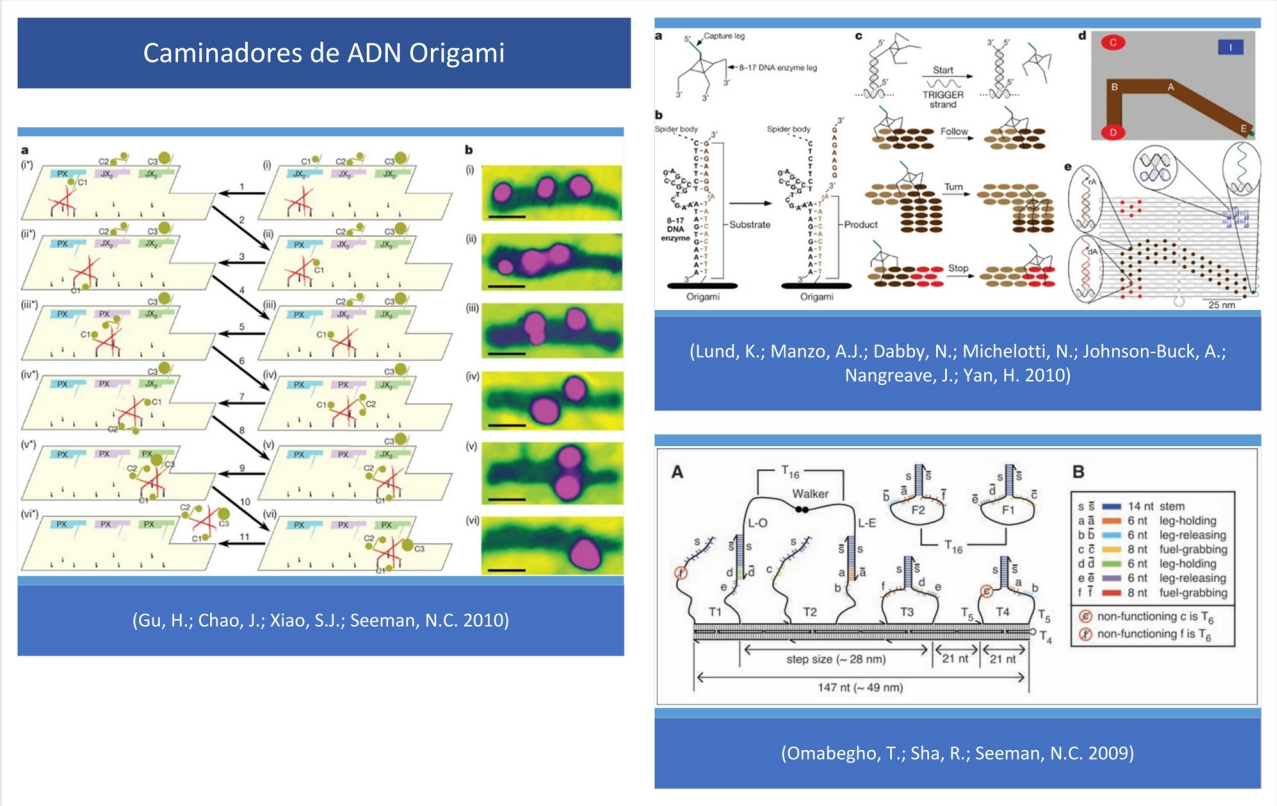


Fig.6. Schematics of the functioning of the origami DNA walkers that would explain the movement of components, particles and clusters of GQD graphene quantum dots in the analyzed samples of the Pfizer vaccine. This motion can be observed in video 1 and in full in the reference (Delgado, R. 2021).

Continuing the analysis of (Wang, J.; Yue, L.; Li, Z.; Zhang, J.; Tian, H.; Willner, I. 2019), it is added that "*Edge functionalization of origami mosaics (of DNA templates), was applied to design programmed multicomponent origami structures and, in particular, to develop interchangeable origami dimers*". In other words, DNA templates can be defined in such a way that they conform to specific parts (particles, proteins, quantum dots, etc.) according to a predetermined program or pattern.

However, DNA origami technology can encompass other areas, as the state-of-the-art experiences of Wang and his team show, "*ingenious 3D origami systems were fabricated. For example, self-assembly of an origami box, stepwise assembly of gigadalton-scale programmable DNA structures, and light-driven motion of 3D origami bundles to produce reversible chiroptic functions have been demonstrated. Different applications of origami nanostructures were suggested, including programmed catalysis, controlled drug release, logic gate operations and sensing*." Among the mentioned applications, it is worth mentioning the logic gating and sensing operations, typical of QCA (Quantum Cell Automata) circuit design already discussed in the identification of nanorouters among the patterns observed in vaccines. This is further evidence that the DNA origami methodology is valid for developing electronic devices based on quantum dots, given the ability to control the ordered construction of wires and circuits.

Having completed the review of the preambles to the article by (Wang, J.; Yue, L.; Li, Z.; Zhang, J.; Tian, H.; Willner, I. 2019), the scientific discourse turns to the object of the cavities or holes in the "origami rafts", which in the vaccine are shown as quadrangular structures with a dot inscribed within their area. As stated "*Most of these functional origami structures involved, bottom-up modification of the origami rafts, modification of the edge of the origami tiles or folding of the tiles into tubes. However, functionalization of origami structures with nanocavities (holes or*

barrels) that could act as containment or channels for guided chemical transformations can be considered. To date, such cavities have been fabricated within the passive assembly of origami tiles and these cavities were used for site-specific docking of antibodies, reconstitution of membrane proteins and functionalization of solid-state pores for selective transport. In addition, DNA structures (not origami) have been introduced into membranes and these acted as channels for potential stimulated transport of cargo species across membranes. In contrast, the present study introduces the concept of active fabrication of nanoholes in origami tiles. We report on the DNAzyme-guided active formation of nanoholes in origami scaffolds and the molecular mechanical unblocking of nanoholes by lifting the covered window domains. By applying two different DNAzymes, the programmed and activated fabrication of nanoholes in origami structures is demonstrated. In addition, we use the cavities in the different origami scaffolds as confined nanoenvironments for selective and specific catalysis. In addition, we highlight a design for light-reversible mechanical opening and closing of the nanoholes, and switchable catalysis in the nanocavities." In this explanation, which leaves no doubt as to the intentionality of the manufacture of the origami technique, there is a fundamental detail that must be seriously considered. This is the ability of the cavities in the DNA origami structures to trap, immobilize and attach antibodies (Ouyang, X.; De-Stefano, M.; Krissanaprasit, A.; Bank-Kodal, A.L.; Bech-Rosen, C.; Liu, T.; Gothelf, K.V. 2017), which would originally be intended to serve for serological studies, but applied to the construction of intracorporeal micro/nano-scale electronic devices, could achieve the goal of preventing phagocytosis and immobilization of self-conforming structures. It is also revealed that these holes have a very important role in the interaction with other origami DNA sequences, which can fit together (like a Lego piece) to add new construction scaffolds, as explained by (Kurokawa, T.; Kiyonaka, S.; Nakata, E.; Endo, M.; Koyama, S.; Mori, E.; Mori, Y. 2018) in Figure 7.

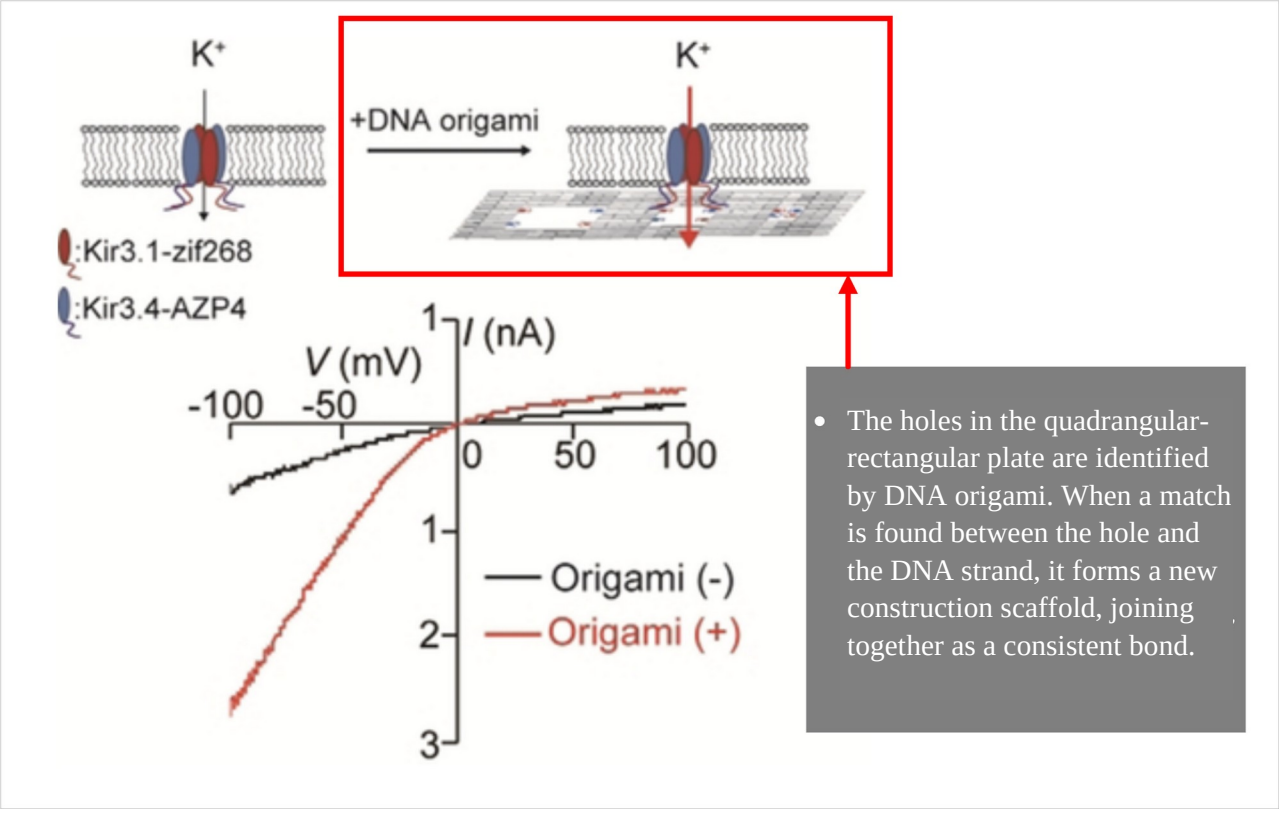


Fig.7. Assembly of DNA origami into holes in quadrangular plates, which are also plates made up of DNA origami structures (Kurokawa, T.; Kiyonaka, S.; Nakata, E.; Endo, M.; Koyama, S.; Mori, E.; Mori, Y. 2018). This demonstrates that DNA serves as a de facto building block that serves to guide the integration of other molecular components and materials, such as graphene quantum dots, with which electronic devices can be constructed.

Another application cited by Wang and his team for the holes is to serve as channels or pores through the DNA origami plate or structure for the purpose of developing biosensors, as corroborated by (Seifert, A.; Göpfrich, K.; Burns, J.R.; Fertig, N.; Keyser, U.F.; Howorka, S. 2015 | Burns, J.R.; Seifert, A.; Fertig, N.; Howorka, S. 2016). Indeed it is stated that "*Membrane-crossing nanopores from folded DNA are a recent example of artificial biomimetic nanostructures that may open up applications in biosensors, drug delivery, and nanofluidics.... We establish that DNA pores exhibit two voltage-dependent conductance states. Low transmembrane voltages favor a stable level of high conductance, which corresponds to an unobstructed DNA pore. The expected inner width of the open channel is confirmed by measuring the change in conductance as a function of poly(ethylene glycol) (PEG) size, whereby smaller PEGs are assumed to enter the pore*." This not only fits with one of the components stated in the excipient list of the Pfizer vaccine, as it also matches the conductance needed for the human body-oriented nano-network components (Yang, J. ; Ma, M.; Li, L.; Zhang, Y.; Huang, W.; Dong, X. 2014 | Abbasi, Q. H.; Yang, K.; Chopra, N.; Jornet, J.M.; Abuali, N.A.; Qaraqe, K.A.; Alomainy, A. 2016 | Oukhatar, A.; Bakhouya, M.; El Ouadghiri, D. 2021)

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