COVID Vaccines: a Curious Discovery on the Graphene Oxide Question

Dr Robin Wakeling, 2 September 2022

The complex 2D structures observed in microscopic images of COVID-19 vaccine samples has raised concerns about the presence of graphene oxide. However, the presence of 2D crystalline structures *per se* are probably not signatures of graphene oxide but are signatures of something else, something more profound perhaps.

Some substances have a molecular structure and chemical nature that causes them to form two-dimensional (2D) sheet-like "crystals" instead of the more familiar three-dimensional (3D) crystal shape. For example, a single layer of graphene oxide (GO) consists of a sheet of interconnected hexagonal graphite rings with a carbon atom at each corner of each hexagon, forming a honeycomb-like layer of carbon atoms. Single or multiple layers of GO are therefore predisposed to form a 2D structure because of its specific chemistry.

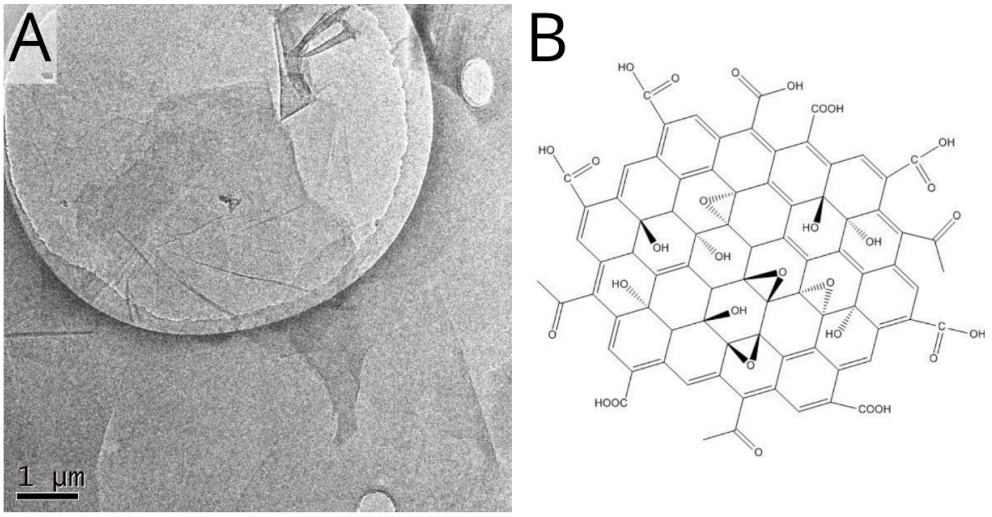

Figure 1. (A) Transmission electron micrograph image of single layer graphene oxide powder, (B) Proposed structure of 2D graphene oxide based on hexagonal carbon rings.

2D is a quasi-term because even a single layer of GO has a thickness, its third dimension. However, crystal structure and concomitant crystal shape is not necessarily predetermined by the inherent physiochemical properties of the substance(s) that form them. Sometimes, it is largely the nature of the environment that determines crystal shape.[1,2,3]

Our light microscopy studies demonstrated that we could form 2D crystals from aqueous solutions consisting only of sodium chloride if we manipulated: (1) the starting concentration, and (2) the rate of evaporation. Remarkably, the 2D structures that we had previously observed in Pfizer-BioNTech Comirnaty™ and other vaccines were very similar, sometimes identical to the 2D structures that formed from solutions of NaCl.[4,5] Whilst we were unable to find images of similar 2D structures

within the scientific literature, there were publications that described the ability of sodium and chlorine/chloride to form 2D crystals. The size of the 2D crystals is comparable to 3D NaCl crystals, ranging from one centimetre to less than one micrometer, i.e., it is their odd shape, not their size that is remarkable.

According to the crystallography literature,[1] the principle of molecular "confinement" causes a substance to behave very differently,[3] one potential consequence of which is the formation of 2D crystals. Nano-scale confinement of water molecules[3] has received special attention because it is the universal solvent of many vital life processes including intracellular functionality (or dysfunction). In a nutshell, nano-confinement of water molecules and concomitant "molecular crowding"[6] at an interface such as a glass microscope slide and coverslip may mimic the entropic dynamics of the myriad intracellular interfaces that occur between water and the proteins, lipids, osmolytes, ions, nucleic acids, sugars and salts contained within the cytosol and organelles that determine cellular function.[6] Our *in vitro* method may therefore provide a window into a very small part of *in vivo* cellular function, at least with respect to the nano-confinement dynamics of water, chloride ions, sodium ions and a generic interface represented by glass. The forces of nano-confinement will inevitably change/intensify during the experiment due to the forces associated with slow evaporation at the glass-water-salt interfaces, part of the expression of which could be 2D crystal formation: these 2D structures are very closely adpressed to the glass where nano-confinement most likely occurs.

Alternatively, our observations may be what amounts to an artefact or oddment of our artificial *in vitro* method. Nonetheless, the 2D structures described are very real and now that we have a better understanding of when and where they occur, the question of how and why they occur requires an explanation, one that best fits the extent of our science and its logical derivations and extrapolations. This is a complex subject that will likely require exploration of the references provided followed by an iterative reordering and realignment of conventional wisdom and understanding.

It is known that when molecules are confined within very small spaces in the nanoscale, their properties and behaviour can change in extraordinary ways that defy previously accepted scientific principles.[7,8,9,10] Interestingly, sodium and chlorine/chloride have been reported to form 2D crystals under extreme pressures,[11,12] and in the presence of GO at ambient pressure. Otherwise, unstable Na_2Cl and/or Na_3Cl formed at high pressure, or because of the possible influence of proximal Pi-bond (covalent chemical bond) energy from the graphite rings of GO[6] and/or the reactivity of its rich oxygen-containing functional groups[13] at ambient pressure respectively. The structure of Na_3Cl was reported to consist of layers of pure Na sandwiched between layers of NaCl and inferred that

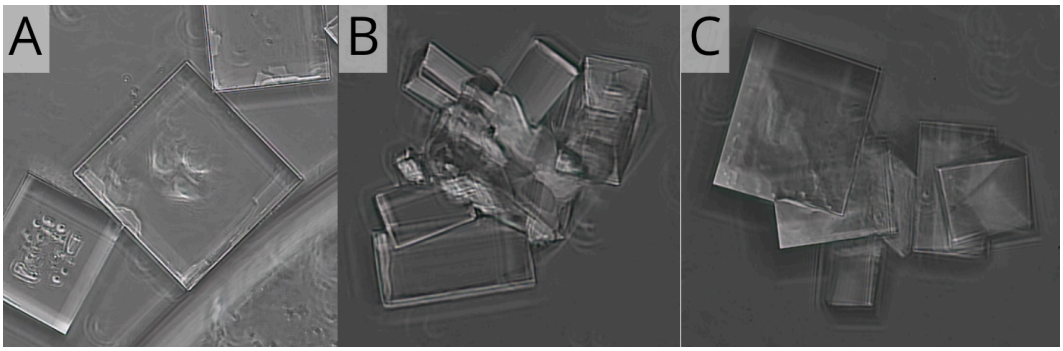

Figure 2. (A)-(C) Phase contrast images of classical 3D cubical NaCl crystals from saturated aqueous solution

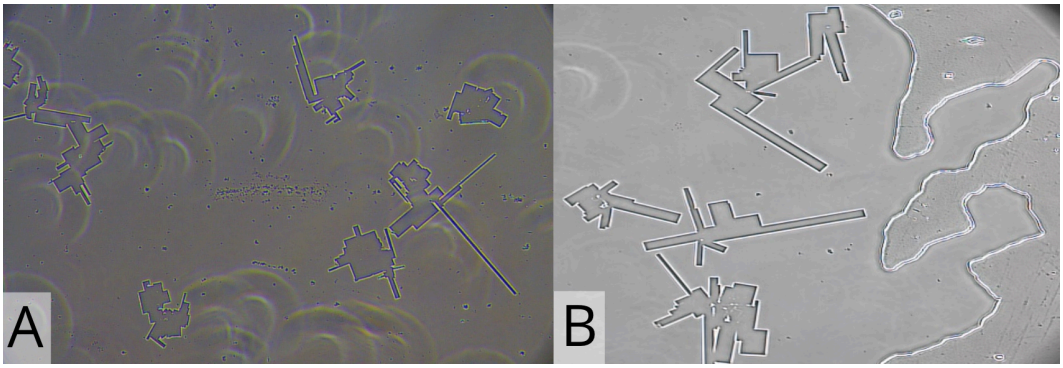

Figure 3. (A)&(B) 2D crystals from 0.9% NaCl solution (NaCl, Na_2Cl, Na_3Cl..?)

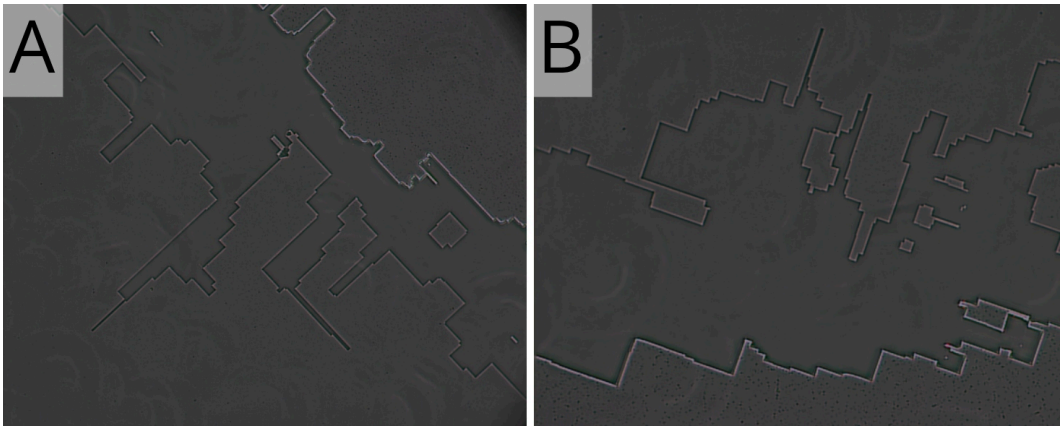

Figure 4. (A)&(B) 2D crystal expansions from 0.9% NaCl solution (NaCl, Na_2Cl, Na_3Cl..?)

this structure predisposed Na_3Cl to from 2D crystals instead of the 3D cubic crystals of NaCl. We do not yet know if our 2D structures seen during our light microscopy studies contained Na^+ and Cl^- in a 1:1 ratio (NaCl) or a different ratio, e.g., the 3:1 ratio in Na_3Cl.[7,8,9,14,15,16,17,18] Given the marked difference in appearance between the classic cubic structure of NaCl (Figure 2. A-C) and our 2D structures (Figure 3. A&B and Figure 4. A&B), it is tempting to suggest that they are not NaCl.

Our studies appeared to demonstrate that 2D crystals form from a 0.9% (isotonic) aqueous solution

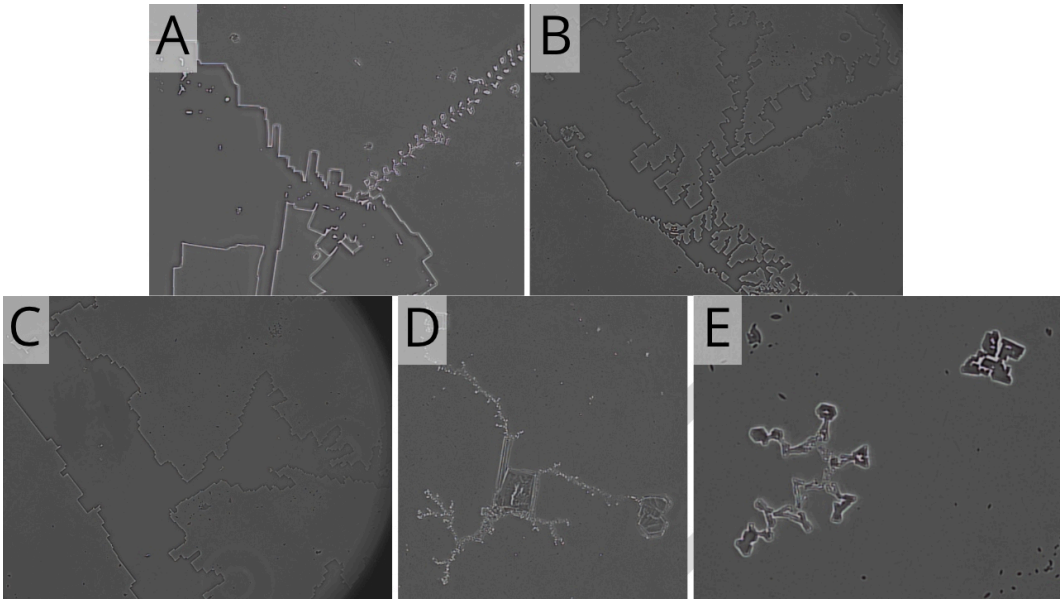

Figure 5. (A)-(E) Other crystal shapes from 0.9% NaCl solution (NaCl, Na_2Cl, Na_3Cl..?)

of NaCl left to evaporate slowly at ambient conditions using a standard preparation of a single drop of solution on a microscope slide covered with a coverslip. Higher concentrations of NaCl and/or faster drying rates produced classical 3D cubic crystals or a diverse array of other structures some of which appeared to be intermediate between 3D and 2D. With a starting solution of 0.9% and approximately 12-24 hours of ongoing evaporation, 2D crystals started to form after approximately 12 hours near the evaporation zone (air-liquid interface) but typically not elsewhere on the preparation. It is possible that these remarkable 2D structures have been missed in the past because of the need for observation during rarefied evaporative and initial concentration conditions coupled with the fact that they only form over a small area of the microscope slide preparation.

Perhaps the appearance of these remarkable 2D structures during the COVID debacle, may in part be linked to some of the remarkable discoveries and theories of Dr Rupert Sheldrake, Dr Robert Lanza and others? Our recent observation of these 2D crystals at this time may have touched on a fundamental scientific causality that we are only just beginning to understand. Sheldrake's theory of morphogenetic resonance[19] and Lanza's theory of biocentrism[20] have explored the edges of our scientific frontiers in this regard. Also within this paradigm, Veda Austin has reported that water can store information from, and reproduce images ('hydroglyphs') of, the local environment including images of objects and activity.[21] When the water freezes there appears to be a synchronicity between the shape of ice crystal patterns and the environmental influence. Austin also points out that salt and water are interactive within this process.

Once a crystal has formed anywhere for the first time, according to morphogenetic resonance this

Figure 6. An example of a "hydroglyph" - in this case under the influence of adjacent gingko leaves. Source: https://www.vedaaustin.com/examples-1

creates a "field" that then hugely increases the probability of the same or similar crystals forming elsewhere, although it is possible that Professor Tom Campbell's view[22] that something more fundamental than energy fields is at play is more likely. It is curious that something as common as isotonic table salt/saline, something that a plethora of observers would presumably have examined microscopically for over a century has not given rise to published 2D images of the type that are now straightforward to produce.

My own view is that it is unlikely to be coincidence that so many people have observed these images at this time, and neither is it likely to be coincidence that they have such an extraordinarily man-made appearance that has some profound differences to the ordered structures that appear more widely in nature. Our hypothesis is that 2D crystals form consistently from solutions of sodium and chloride ions due to the phenomenon of "confinement" of either the sodium and chloride ions and/or the water molecules at the glass surface wherever there is an appropriate entropic state created by slow evaporation of a relatively weak concentration of ions. We further postulate that many, possibly all of the 2D structures that have been reported[23] as being linked to the possible presence of GO in vaccines and other media are in fact of a different origin and/or causation, at least in large part. This is not to say that GO is absent in situations where its presence was suspected but rather that the presence of 2D structures *per se* are probably not signatures of GO but are signatures of something else, something more profound perhaps. We encourage others to repeat this straightforward but apparently overlooked methodology for producing these extraordinary structures from isotonic saline and to consider their implications within the context of cutting-edge science rather than the dogma of institutionalised scientism.

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