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COVID-19 Business Interruption Claims Validated By Scientific Findings Confirming “Physical Loss And Damage” To Property Caused By SARS-CoV-2

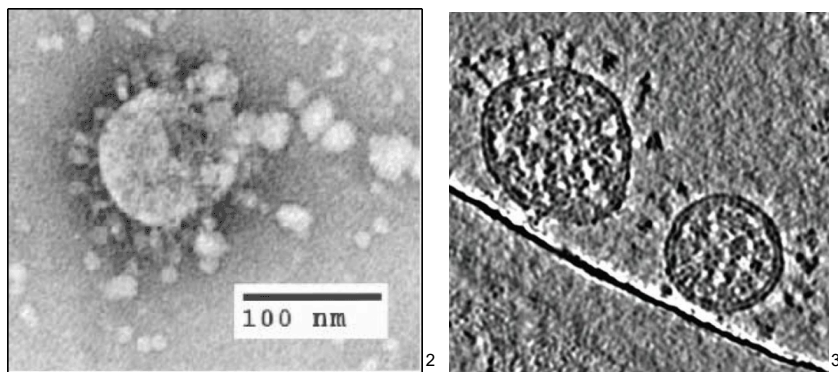
By [Micah Skidmore](#)

For more than a year now, policyholders across the country have urged courts and insurance carriers that the COVID-19 pandemic has caused “physical loss and damage” to insured property, resulting in covered business interruption loss. Lawyers and judges have since grappled with related legal arguments over what is, at least in part, a question that only scientific research can adequately answer. What does the SARS-Cov-2 virus, which causes the disease known as COVID-19, actually do to insured property?

Many carriers (and some courts) have simply assumed that, when expelled by respiration from infected humans, SARS-CoV-2 (the “Coronavirus”) falls and remains gravitationally and harmlessly at rest on solid surfaces until someone simply wipes the virus away with disinfectant.¹ Emerging science has caught up with these assumptions to confirm that the Coronavirus does, in fact, cause a physical alteration to tangible property, qualifying as “physical loss and damage” even under the most narrow reading of those terms.

The “Coronavirus” is so named because its physical appearance resembles a “corona” or “crown.” As images in the media have portrayed since the early days of the pandemic, SARS-CoV-2 is spherical, with clubs or “spikes” protruding uniformly from its outer surface:

¹ See, e.g., *Town Kitchen LLC v. Certain Underwriters at Lloyd’s, London*, 2021 U.S. Dist. LEXIS 36191, 2021 WL 768273, at *7 (S.D. Fla. Feb. 26, 2021) (“Lastly, the deadly coronavirus is surely an order of magnitude more dangerous than construction debris. However, to the extent this argument is about the danger each poses while resting on surfaces, they are both eliminated in the same way—with Lysol and a rag. At this point in the pandemic, it is widely accepted that life can go on with hand sanitizer and disinfecting wipes. Indeed, Town Kitchen has continued to operate a take-out business from the very premise they argue has suffered direct physical loss. The Eleventh Circuit’s holding in *Mama Jo’s* did not rely on the danger or harmlessness of the debris at issue, it relied on what needs to be done to ‘repair’ the problem. Because the ‘repairs’ here consist of the routine disinfecting with which we are all familiar and cleaning costs are not tangible, physical losses but rather economic losses, the Court rejects the Plaintiff’s ‘physical contamination’ theory—and ultimately dismiss its complaint for failure to state a claim for breach of contract and a declaratory judgment.”).



The spikes on the outside of the virus are composed of proteins, which the Coronavirus uses ultimately to bond with and invade human cells. But when these spike proteins are not bound to a human ACE2 receptor, spike proteins nonetheless impact how the Coronavirus interacts with other substances, including property.

Spike proteins are made up of different amino acids, which, by virtue of their molecular structure, have distinct chemical properties and, in some cases, carry an electric charge. These chemical and electric properties dictate how the Coronavirus behaves in the air and on surfaces. For example, depending on pH levels, the carboxyl amino groups (COOH & NH₂), which are found on SARS-CoV-2 spike proteins, form hydrogen bonds with substances containing oxygen or hydroxyls (OH), such as wood, cotton or glass.⁴ Positively charged NH₃ amino acid structures, which are also found on Coronavirus spike proteins, bind with negatively charged metallic surfaces.⁵ Depending on the ambient humidity, moisture levels on different property surfaces may augment chemical interactions between Coronavirus spike proteins and the specific property exposed to the virus.⁶

When viral spike proteins bind with property surfaces, those surfaces change physically. Beyond the change in their chemical composition, surface roughness is measurably increased.⁷ And property exposed to SARS-CoV-

² <https://www.cdc.gov/sars/lab/images/coronavirus2.gif>

³ Adamczyk, et al., *SARS-CoV-2 virion physicochemical characteristics pertinent to abiotic substrate attachment* Figure 1, *Current Opinion in Colloid & Interface Science* (Vol. 55 Jun 2, 2021), available at <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8169569/>.

⁴ Joonaki, et al., *Surface Chemistry Can Unlock Drivers of Surface Stability of SARS-CoV-2 in a Variety of Environmental Conditions*, at 2137, *CHEM* (Sept. 10, 2020), available at [https://www.cell.com/chem/pdf/S2451-9294\(20\)30411-3.pdf](https://www.cell.com/chem/pdf/S2451-9294(20)30411-3.pdf) (“Therefore, -NH₂, -NH₃⁺, -COOH, and -COO⁻ groups of amino acids in the SARS-CoV2 S protein drive adsorption onto the solid surfaces through double electrostatic interactions between the virion’s ionized surface-active species and the oppositely charged surfaces, as well as hydrogen bonding based on the surface characteristics.”).

⁵ *Id.*

⁶ *Id.*

⁷ Xie, et al., *A Nanochemical Study on Deciphering the Stickiness of SARS-CoV-2 on Inanimate Surfaces*, at Fig. 2, *ACS Appl Matter Interfaces* (Dec. 30, 2020), available at

2 also becomes more hydrophobic, *i.e.*, more likely to repel water, after interaction with the Coronavirus's spike proteins.⁸ Accordingly, even if, *arguendo*, the threshold coverage trigger of "physical loss or damage" is interpreted to require a physical alteration or physical change in property, the chemical interaction between SARS-CoV-2 and ordinary property surfaces like metal, wood, fabric, plastics and glass create just that—a physical change.

Similar chemical changes occur when SARS-CoV-2 is released into the air. The Centers for Disease Control and the World Health Organization have both acknowledged that COVID-19 is transmitted through the air. Once an infected person talks, coughs, sneezes, sings or breathes, the Coronavirus may remain airborne for hours at a time. Scientific research has confirmed that the same spike proteins that become chemically and electrostatically adsorbed on various solid surfaces can react with particulate matter in the ambient air, including minerals, soot or plastics.⁹ Here again, the assumption that respiratory droplets containing the Coronavirus do not physically alter or change the air within insured premises is not justified by scientific evidence. To the contrary, the chemical bonding and electrostatic interaction between SARS-CoV-2 spike proteins and ambient particulate matter observed in scientific literature¹⁰ indicate that a physical alteration or physical change in the air occurs upon exposure to the Coronavirus.

While there remains a vibrant legal debate over the meaning of the terms "physical loss or damage," the insurance carriers and courts adopting the most conservative and constrained interpretation of this basic trigger for business interruption coverage have asserted that some physical change or alteration in property is

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7770894/?report=classic> ("The bare glass, gold, SS, and PS surfaces exhibit a root-mean-square (RMS) roughness of 0.3–0.7 nm, and such smooth surfaces allow the accurate observation of protein adsorption. It is noted that the uniform grainlike pattern on bare metal (*i.e.*, gold and SS) surfaces is arising from their metal particles. After spike protein adsorption, all the surfaces become rough with the obvious binding of spike protein as indicated by the white dots shown in Figure2.").

⁸ *Id.* at § 2.2, Fig. 3 ("[T]he water contact angle increases from $28.4^\circ \pm 0.6^\circ$ for the AFM probe without protein modification to $40.2^\circ \pm 0.8^\circ$ for the protein-functionalized AFM probe (inset of FigureFigure33A), which suggests that the AFM probe becomes relatively hydrophobic after the protein modification.").

⁹ Duval, et al., *Chemodynamic features of nanoparticles: Application to understanding the dynamic life cycle of SARS-CoV-2 in aerosols and aqueous biointerfacial zones*, *Adv. Colloid Interface Sci.* (Apr. 2021), available at <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7931671/> ("Virions that are shed in respiratory droplets may sorb to PM that is initially present in the respiratory droplet or encountered during the droplet's trajectory through the atmosphere. Airborne PM is heterogeneous in size and chemical composition, comprising a diverse range of inorganic and organic materials, e.g. minerals, soot, plastics, as well as various sorbed species."); see also Liu, et al., *Aerodynamic characteristics and RNA concentration of SARS-CoV-2 aerosol in Wuhan hospitals during COVID-19 outbreak*, *bioRxiv* (Mar. 10, 2020), available at <https://www.biorxiv.org/content/10.1101/2020.03.08>.

¹⁰ Setti, et al., *SARS-CoV-2 RNA found on particulate matter of Bergamo in Northern Italy: First evidence, Environmental Research* (Sept. 2020), available at <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7260575/> ("This is the first evidence that SARS-CoV-2 RNA can be present on outdoor particulate matter, thus suggesting that, in conditions of atmospheric stability and high concentrations of PM, SARS-CoV-2 could create clusters with outdoor PM10 and – by reducing their diffusion coefficient – enhance the persistence of the virus in the atmosphere.").

required.¹¹ Accepting that interpretation, solely for the sake of the argument, scientific studies addressing the interaction between Coronavirus spike proteins and both ambient airborne particulate matter and common property surfaces, such as metals, wood, plastics, fabrics and glass, scientifically justify policyholders' allegations that SARS-CoV-2 does cause a tangible, measurable and physical change or alteration in property.

Accordingly, insurance carriers and courts should be careful not to engage in assumptions about complex physical phenomenon that are not justified by science. Policyholders, likewise, should be careful to ensure that the best of modern science is employed to validate ongoing claims for business interruption loss relating to the COVID-19 pandemic.

If you have any questions about pandemic-related business interruption coverage or about insurance recovery in general, please contact one of Haynes and Boone's [Insurance Coverage Practice Group](#) partners listed below.

¹¹ *Oral Surgeons, P.C. v. Cincinnati Ins. Co.*, 2021 U.S. App. LEXIS 19775, at *4, 2021 WL 2753874 (8th Cir. Jul. 2, 2021) (“The policy here clearly requires direct ‘physical loss’ or ‘physical damage’ to trigger business interruption and extra expense coverage. Accordingly, there must be some physicality to the loss or damage of property—e.g., a physical alteration, physical contamination, or physical destruction.”).