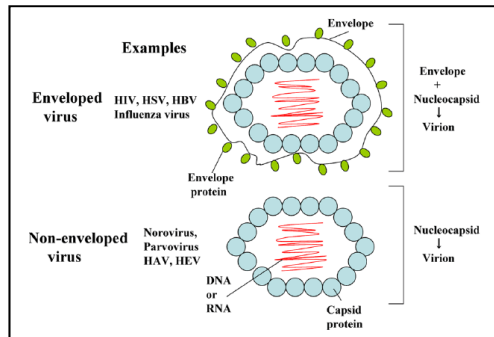


*Addressing Coronavirus Concerns With
UVAIRx
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Viruses are either enveloped or non-enveloped as shown in the following picture.



Viruses are the most difficult pathogens to test, as they require a living host to incubate and are also very expensive to test. As a result, viruses are the least studied pathogen regarding the effects of photocatalytic oxidation (PCO). The method of testing viruses is normally to use a surrogate, since the actual virus is seldom available. To prove PCO kills a high percentage of Coronavirus (COVID-19, an enveloped virus), a surrogate or close relative of this strain was used for test purposes. Previous testing on H5N8, an enveloped virus used as a surrogate for H1N1 (Swine Flu) and H5N1 (Avian Flu) viruses, has been conducted by Kansas State University, M.T. Ortega, et al 2007, and, using the same reactor employed by Generation 1 UVAIRx units, found a complete reduction in virus viability (100% in 24 hours). Testing has also been done at Kansas State University on Influenza A virus, which H1N1 and H5N1 are a subgroup of. The results showed 100% kill in 10 hours using the same reactor.

Testing by Dr. Leila K. Riley RADIL, LLC in Columbia, Missouri using the same reactor showed a 99.6% reduction in Norovirus (a non-enveloped virus) over a 24 hour period using MNV-4 (Murine Norovirus). Therefore, previous testing does show extremely positive results on very similar enveloped viruses as well as non-enveloped, positive and negative sense viruses (see the following table).

Since COVID-19, positive sense and enveloped, is very similar to H1N1 and H5N1 (both being negative sense and enveloped viruses and being a subgroup of Influenza A virus, negative sense and enveloped). Testing has proven the UVAIRx reactor is also very effective against Norovirus, a non-enveloped positive sense stranded virus. Therefore, it is clear evidence that UVAIRx would have a significant impact on the current strain of Coronavirus.

The illustration included describes the difference between enveloped and non-enveloped viruses. The table on the next page shows some of the testing that has been done on PCO using the UVAIRx reactor and the results. All papers are available in published form over the Internet or directly from UVAIRx.

Reviewed by: Dr. Gregg Dickerson, MD
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Tested Pathogen	Specific Name	Structure	Similar Pathogens	Kill Rate	Reference
Norovirus	Norwalk Virus	Positive sense, non-enveloped, stranded Virus	Kennel cough, Canine Hepatitis, Adenovirus, Rhinovirus, Hepatitis A, Conjunctivitis and many, many more	99.9% over 24 hours	Dr. Leila K. Riley, Columbia, MO 11/08
Staphylococcus Aureus	Staph (bacteria)	Gram positive, enveloped, Round-shaped Bacterium	Skin infections, abscesses, respiratory infections, sinusitis, food poisoning	99.9% reduction in 24 hours	M.T. Ortega, et al Kansas State, 2007
Methicillin Resistant Staphylococcus Aureus	MRSA	Gram positive, enveloped, round-shaped Bacterium	Responsible for several difficult to treat infections resistant to antibiotics	99.9% Reduction in 24 hours, 100% reduction in 24 hours	M.T. Ortega, et al Kansas State; Lyle Labs NYC
Clostridium Difficile	C. diff	Gram positive, enveloped, spore-forming Bacterium	Diarrhea, fever, nausea, and abdominal pain, colon issues	99.9% reduction in 24 hours	M.T. Ortega, et al Kansas State 2007
Listeria Monocytogenes	Listeria	Gram positive, enveloped, endospore forming Bacterium	Formicates; can affect brain, spinal cord membranes and/or bloodstream of host	100% reduction in 24 hours	M.T. Ortega, et al Kansas State 2007
Group A Streptococcus	Strep throat, GAS	Gram positive chain, encapsulated, Bacterium	Scarlet fever, impetigo, rheumatic fever	96% reduction in 24 hours	M.T. Ortega et al Kansas State 2007
Pseudomonas Aeruginosa		Gram negative, rod-shaped, encapsulated Bacterium	Salmonella, Citrobacter ("good" intestine bacteria) S. Marcescens, Pseudomonas, Enterobacter, Cholera, V. Vulnificus, V. Paralaemolyticus; natural resistance to antibiotics	99.9% reduction in 24 hours	M.T. Ortega et al Kansas State 2007
Streptococcus Pneumonia	Pneumonia	Lancet-shaped, gram positive, enveloped Bacterium	Respiratory infections including Pneumonia, Pneumococcal Meningitis	99.9% in 24 hours	M.T Ortega et al Kansas State 2007
Bacillus Anthracis	Anthrax	Gram positive, enveloped, spore forming rod shaped Bacterium	Fever and chills, swelling of neck, nausea, vomiting, diarrhea, flushing and red eyes, swelling of abdomen, could cause death	99.9% reduction in 24 hours	M.T. Ortega et al Kansas State 2007
H1N1	Swine Flu	Negative sense, enveloped, stranded Virus	Fever, cough, sore throat, muscle pains, conjunctivitis, pneumonia and other breathing issues leading to death; myocardial infarction, arterial thrombosis	100% in 10 hours	M.T. Ortega et al Kansas State 2007
H5N1	Avian Flu (Bird Flu)	Negative sense, enveloped, stranded Virus	Fever, cough, sore throat, muscle pains, conjunctivitis, pneumonia and other breathing issues maybe leading to death	100% in 10 hours	M.T. Ortega et al Kansas State 2007
Influenza A Virus	Influenza	Negative sense, enveloped, stranded Virus	Fever, cough, sore throat, muscle pains, conjunctivitis, pneumonia, and other breathing issues possibly leading to death	100% in 10 hours	M.T. Ortega et al Kansas State 2007
Comparative Pathogen					
Coronavirus	COVID-19	Positive sense, enveloped, single stranded Virus	Upper and lower respiratory infections	Surrogates: H1N1 and H5N1	Not characterized