

## Using Proven Detection Reagents for COVID-19 Research

The recent SARS-CoV-2 outbreak has raised many questions regarding how this novel coronavirus infects humans. We are gaining a deeper understanding of viral transmission between people and aspects that tend to make certain members of the population more susceptible to the virus. Avenues of research that hold promise in identifying which specific organs and cell types are affected include histological approaches using human tissue samples and animal models.

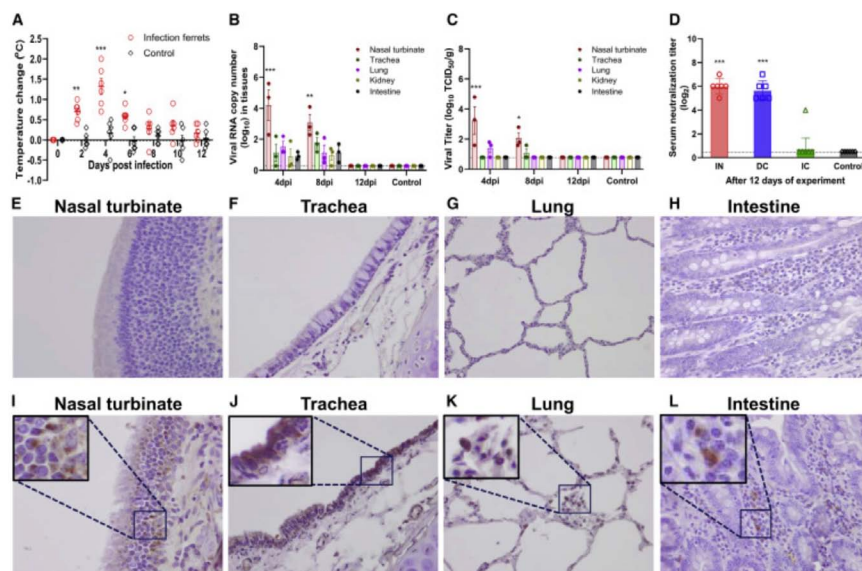
Immunohistochemistry, using proven materials such as the **VECTASTAIN ABC** reagents, was recently utilized to visualize detectable virus in several organs of an infected animal host and ACE2/TMPRSS2 in ocular surface cells [1, 2]. This study helped confirm the extent to which the virus spreads throughout the body and provides data regarding cellular localization of the virus.

Other investigators are exploiting new techniques in cell culture such as 3D organoids to investigate infection routes of coronaviruses. This approach relies primarily on immunofluorescent visualization. Studies by Zhou et al [3] and more recently Lamers et al [4] and Monteil et al [5] utilized human organoids to show both Middle East respiratory syndrome (MERS) coronavirus and SARS-CoV-2 infect gut and kidney cells. Many of these studies relied on **VECTASHIELD antifade mounting media** to maximize signal retention for imaging and data evaluation.

Further quantitative approaches can be obtained using platforms such as ELISAs. In a research article by Wang et al [6], which forewarned of future pandemics with coronaviruses, the authors made a library of neutralizing monoclonal antibodies for developing possible prevention and therapeutic interventions for viral infection. Part of their study involved the detection of biotinylated antibodies using **peroxidase conjugated avidin (Catalog Number A-2014)** in an ELISA assay to assess competition binding to a coronavirus spike protein.

The importance of using established, reliable and reproducible detection reagents cannot be understated for any research endeavor. It seems this point cannot be overstated with ongoing research efforts focusing on addressing questions surrounding the current viral pandemic. **Vector Laboratories** is proud and honored that their products have been trusted in these vital research studies.

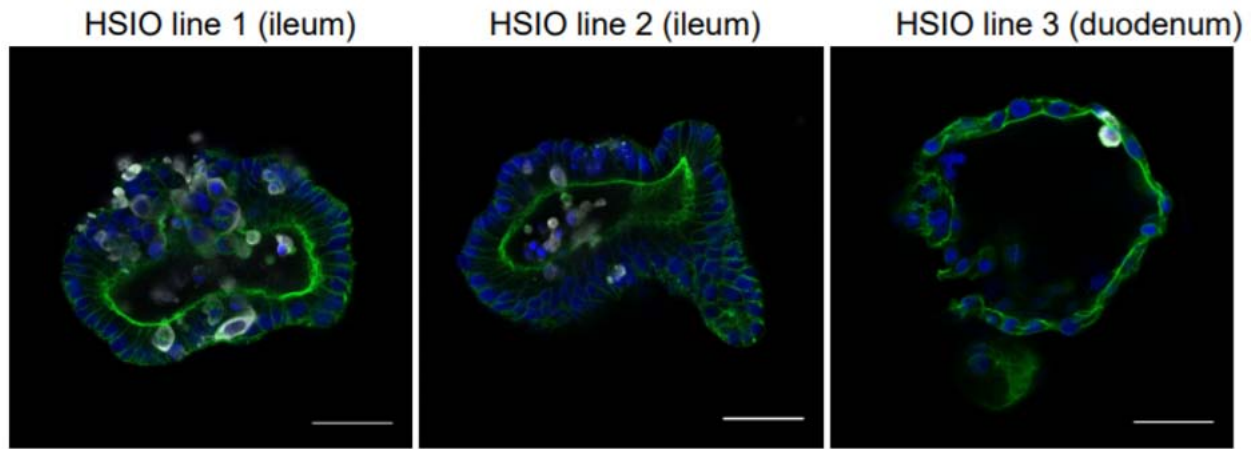
### Learn about how Lectins can be used in Coronavirus Research



**Figure 1** from Kim *et al* [1]. Infection and Rapid Transmission of SARS-CoV-2 in Ferrets. Sections E-H: Control sections. Sections I-L: Specific staining and localization of virus in tissues (using VECTASTAIN).

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**Figure 13** from Lamers *et al.*, [3]. Immunofluorescent staining of SARS-CoV-2 infected intestinal organoids. Staining retained with VECTASHIELD antifade mounting medium.

The following citations showcase Vector Laboratories as a manufacturer of essential IHC and IF detection reagents that can be used to study SARS-CoV-2.

**References:**

1. Kim, Y. *et al.* Infection and Rapid Transmission of SARS-CoV-2 in Ferrets. *Cell Host & Microbe* (2020).
2. Zhou, L. *et al.* ACE2 and TMPRSS2 are expressed on the human ocular surface, suggesting susceptibility to SARS-CoV-2 infection. *The Ocular Surface* (2020).
3. Zhou, J. *et al.* Human intestinal tract serves as an alternative infection route for Middle East respiratory syndrome coronavirus. *Science Advances* (2017).
4. Lamers, M. M. *et al.* SARS-CoV-2 productively infects human gut enterocytes. *Science* (2020).
5. Monteil, V. *et al.* Inhibition of SARS-CoV-2 Infections in Engineered Human Tissues Using Clinical-Grade Soluble Human ACE2. *Cell* (2020).
6. Wang, L. *et al.* Importance of Neutralizing Monoclonal Antibodies Targeting Multiple Antigenic Sites on the Middle East Respiratory Syndrome Coronavirus Spike Glycoprotein To Avoid Neutralization Escape. *Journal of Virology* (2018)