(SD2022-260) Selective Imaging and Inhibition of SARS-CoV-2 Infected Cells, Using A Tunable Protease-Responsive Modular-Peptide-Conjugated AIEgen

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Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is a serious threat to human health without effective treatment. There is an urgent need for both real-time tracking and precise treatment of the SARS-CoV-2 infected cells to mitigate and ultimately prevent viral transmission. However, selective and responsive triggering and tracking of the therapeutic process in infected cells remains challenging.

Researchers from UC San Diego have leveraged a series of main protease (Mpro)-responsive and modular-peptide-conjugated probes for the selective imaging and inhibition of SARS-CoV-2 infected cells via enzyme instructed self-assembly (EISA) and aggregation-induced emission (AIE). In summary, this technology exploits the potential advantages of EISA and the AIE effect for selective detection and treatment of the virus infected cells. When combined with SARS-CoV-2 replication characteristics, a Mpro-responsive modular peptide with conjugated AIEgens named PSGMR offers selective imaging and inhibition of the Mpro plasmid transfected HEK 293T cells and SARS-CoV-2 infected TMPRSS2-Vero cells.

This patent-pending strategy will open new avenues for the development of theranostic agents against COVID-19 and other emerging diseases.