



THE BUSINESS PARTNER
FOR YOUR IDEAS



VIRUS-LIKE NANOCARRIER FOR CELL-SPECIFIC LARGE CARGO DELIVERY

THERAPEUTICS

Viral vector system with engineered capsids that form quasi-enveloped viruses for large cargo drug delivery.

TECHNOLOGY TYPE

Gene Therapy, Silencing, &
Editing
Research Tools & Reagents

STAGE OF DEVELOPMENT

Cargo packaging with quasi-enveloped viruses underway.

IP PROTECTION

Provisional patent filed.

LEARN MORE

Reference Number: U-6648

Aaron Duffy

Technology Manager
aaron.duffy@tvc.utah.edu
801-585-1377

TECHNOLOGY SUMMARY

University of Utah researchers have created a vector system in which capsids from non-enveloped viruses are modified to produce quasi-enveloped viruses. The system is engineered to direct self-release within the vesicle and contains three modular activities: (1) membrane binding, (2) self-assembly, and (3) ability to recruit ESCRT machinery to catalyze membrane fission for release from the cell. Vesicles with internal capsids do not display any antigenic viral properties and are inaccessible to neutralizing antibodies. Specific receptor ligands can be included for cell-specific targeting. Additionally, different genetic elements could be split among multiple capsids, increasing the overall drug payload and overcoming size limitations of enveloped viruses.

FEATURES AND BENEFITS

- Offers reduced immunogenicity.
- Enables cell-specific targeting with addition of receptor ligands to vesicles.
- Provides increased drug cargo carrying capacity, as multiple capsids can be incorporated into each vesicle.
- Delivery cargo can be proteins, mRNAs, or DNA editing complexes.

RECENT PUBLICATIONS

Votteler, J., Ogohara, C., Yi, S., Hsia, Y., Nattermann, U., Belnap, D. M., . . . Sundquist, W. I. (2016). Designed proteins induce the formation of nanocage-containing extracellular vesicles. *Nature*, 540(7632), 292-295. doi: [10.1038/nature20607](https://doi.org/10.1038/nature20607)

Wagner, J. M., Christensen, D. E., Bhattacharya, A., Dawidziak, D. M., Roganowicz, M. D., Wan, Y., . . . Pornillos, O. (2017). A general model for retroviral capsid pattern recognition by TRIM5 proteins. *Journal of Virology*. doi: [10.1128/jvi.01563-17](https://doi.org/10.1128/jvi.01563-17)

INVENTOR PROFILE

Wesley Sundquist, Ph.D., [Co-Chair & Professor - Biochemistry](#)
Jorg Votteler, Ph.D., Post-Doctoral Fellow - Biochemistry

DATE UPDATED: 7/25/2019