UCLA scientists store materials in cells' natural vaults

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Method may offer safer way to target drugs to living cells

In the realm of nanotechnology, or study of the tiny, scientists often aim to safely deliver and leave material in the human body without causing harm. A big challenge is how to design a package for this biomaterial that will be compatible with living cells and will not provoke an immune reaction. Previous efforts have relied upon viruses or artificial chemicals to house and deliver drugs or other substances to targeted cells.

Scientists at the David Geffen School of Medicine at UCLA have exploited thousands of tiny capsules in cells to store vast amounts of biomaterial. Dubbed vaults – for their high arches reminiscent of cathedral ceilings – these naturally occurring capsules may prove less likely to elicit an immune response than foreign carriers like viruses.

The UCLA discovery will enable many potential applications, including:

-- Therapeutic delivery, such as homing cancer drugs directly to a tumor cell without harming healthy tissue
-- Enzyme delivery to replace missing or defective enzymes, such as those that cause Tay Sachs disease
-- DNA delivery to correct genetic mutations
-- Timed release of drugs, enzymes and DNA
-- Extracting and imprisoning cellular toxins into the vault
-- Stabilizing proteins in vaults to increase their lifespans

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