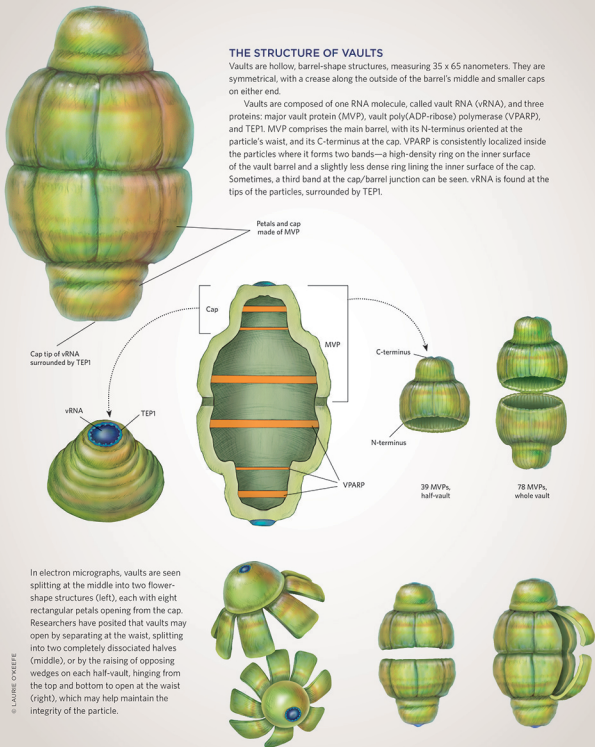


THE STRUCTURE OF VAULTS

Vaults are hollow, barrel-shaped structures, measuring 35 x 65 nanometers. They are symmetrical, with a crease along the outside of the barrel's middle and smaller caps on either end.

Vaults are composed of one RNA molecule, called vault RNA (vRNA), and three proteins: major vault protein (MVP), vault poly(ADP-ribose) polymerase (VPARP), and TEPI. MVP comprises the main barrel, with its N-terminus oriented at the particle's waist, and its C-terminus at the cap. VPARP is consistently localized inside the particles where it forms two bands—a high-density ring on the inner surface of the vault barrel and a slightly less dense ring lining the inner surface of the cap. Sometimes, a third band at the cap/barrel junction can be seen. vRNA is found at the tips of the particles, surrounded by TEPI.



In electron micrographs, vaults are seen splitting at the middle into two flower-shape structures (left), each with eight rectangular petals opening from the cap. Researchers have posited that vaults may open by separating at the waist, splitting into two completely dissociated halves (middle), or by the raising of opposing wedges on each half-vault, hinging from the top and bottom to open at the waist (right), which may help maintain the integrity of the particle.