Immuno–electron micrograph of a plastid-dividing ring (diameter ~500 nm), a structure required for chloroplast division, isolated from the unicellular alga *Cyanidioschyzon merolae*. Immunogold particles (black dots) indicate localization of the glycosyltransferase protein PDR1 (protein dividing ring 1), which forms a ring with carbohydrates that constricts to physically divide the chloroplast. See page 949.

Image: Yamato Yoshida, Haruko Kuroiwa, Tsuneyoshi Kuroiwa/Research Information Center for Extremophile, Rikkyo University, Tokyo, Japan
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Response to Comment on “The Silicate-Mediated Fomrose Reaction: Bottom-Up Synthesis of Sugar Silicates”
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