

## Product Description

SynclereRef™ are monodisperse, non-fluorescent reference vesicles engineered from non-lipid synthetic components using Vesiculate's proprietary Synclere™ technology. SynclereRef™ was developed to address the growing demand for robust vesicular reference materials in biopharma research, particularly within the rapidly expanding fields of extracellular vesicles (EVs), liposomes, lipid nanoparticles (LNPs), and other emerging nanoparticles. SynclereRef™ can be used as standards or tracers for applications including, but not limited to, flow cytometry (FCM), nanoparticle flow cytometry (nFCM), nanoparticle tracking analysis (NTA), dynamic light scattering (DLS), particle analysis/separation method development, or generally as non-fluorescent controls in vesicle-based assays and experiments.

Unlike traditional beads, liposomal or EV-derived reference materials, SynclereRef™ boasts the following features:

- Monodisperse, uniform particle size distribution (PDI  $\leq$  0.05)
- Sub-200 nm size options
- Inert surface chemistry
- Room-temperature colloidal stability and excellent shelf life
- Lower refractive index (RI) than polystyrene beads
- No detectable intrinsic autofluorescence
- No sample preparation or reconstitution required
- Tolerates common buffer concentrations, buffer pH, and salts
- Surfactant-free and additive-free
- Minimal batch-to-batch variation
- Extensively validated using various nanoparticle analyzers

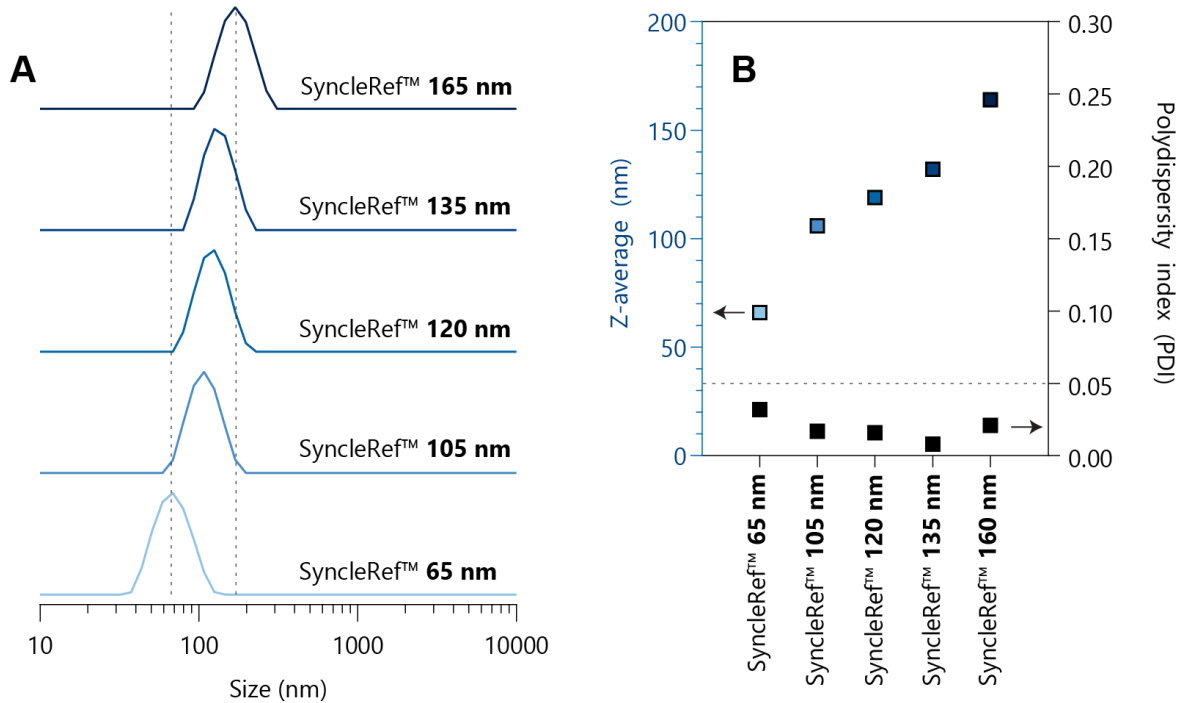
## Full range of SynclereRef™ products

Product name & Nominal vesicle size	Typical PDI	Nominal concentration <sup>a</sup> (particle/mL)	Unit sizes available <sup>b</sup>	Surfactant/additive	Dispersant
SynclereRef™ <b>65 nm</b>	$\leq$ 0.05	$\geq$ 1E9	0.1 / 0.2 / 0.5 mL	None	Water
SynclereRef™ <b>105 nm</b>	$\leq$ 0.05	$\geq$ 1E9	0.1 / 0.2 / 0.5 mL	None	Water
SynclereRef™ <b>120 nm</b>	$\leq$ 0.05	$\geq$ 1E9	0.1 / 0.2 / 0.5 mL	None	Water
SynclereRef™ <b>135 nm</b>	$\leq$ 0.05	$\geq$ 1E9	0.1 / 0.2 / 0.5 mL	None	Water
SynclereRef™ <b>165 nm</b>	$\leq$ 0.05	$\geq$ 1E9	0.1 / 0.2 / 0.5 mL	None	Water

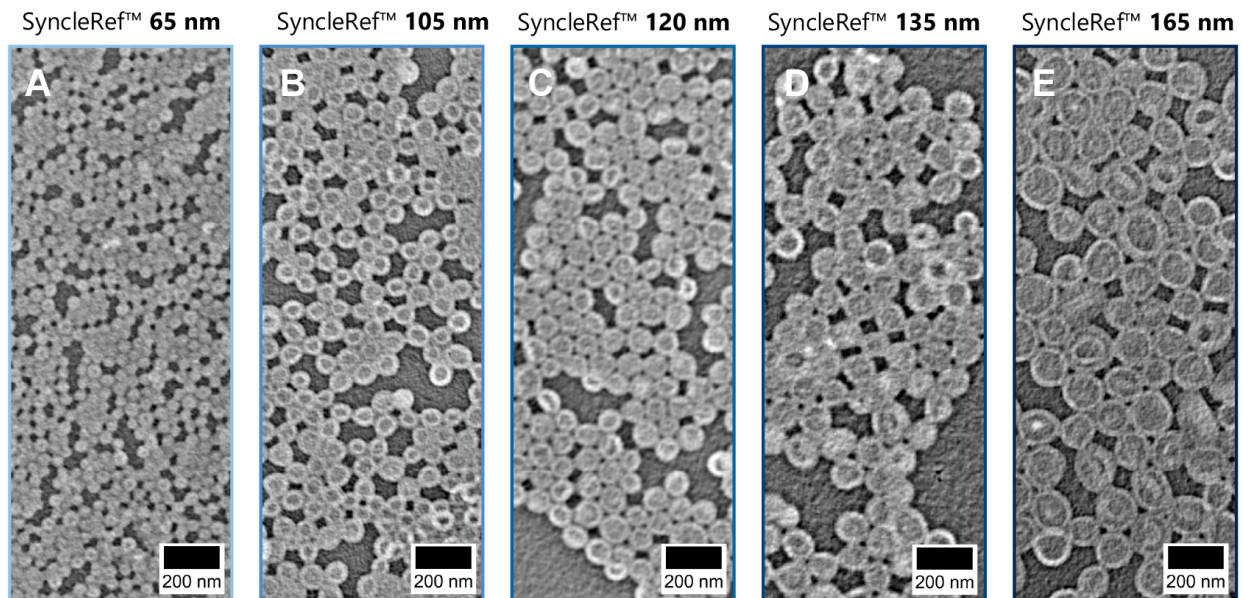
<sup>a</sup>Refer to Certificate of Analysis (CoA) for batch/lot-specific information.

<sup>b</sup>Please contact [hello@vesiculate.com](mailto:hello@vesiculate.com) if you require larger volumes.

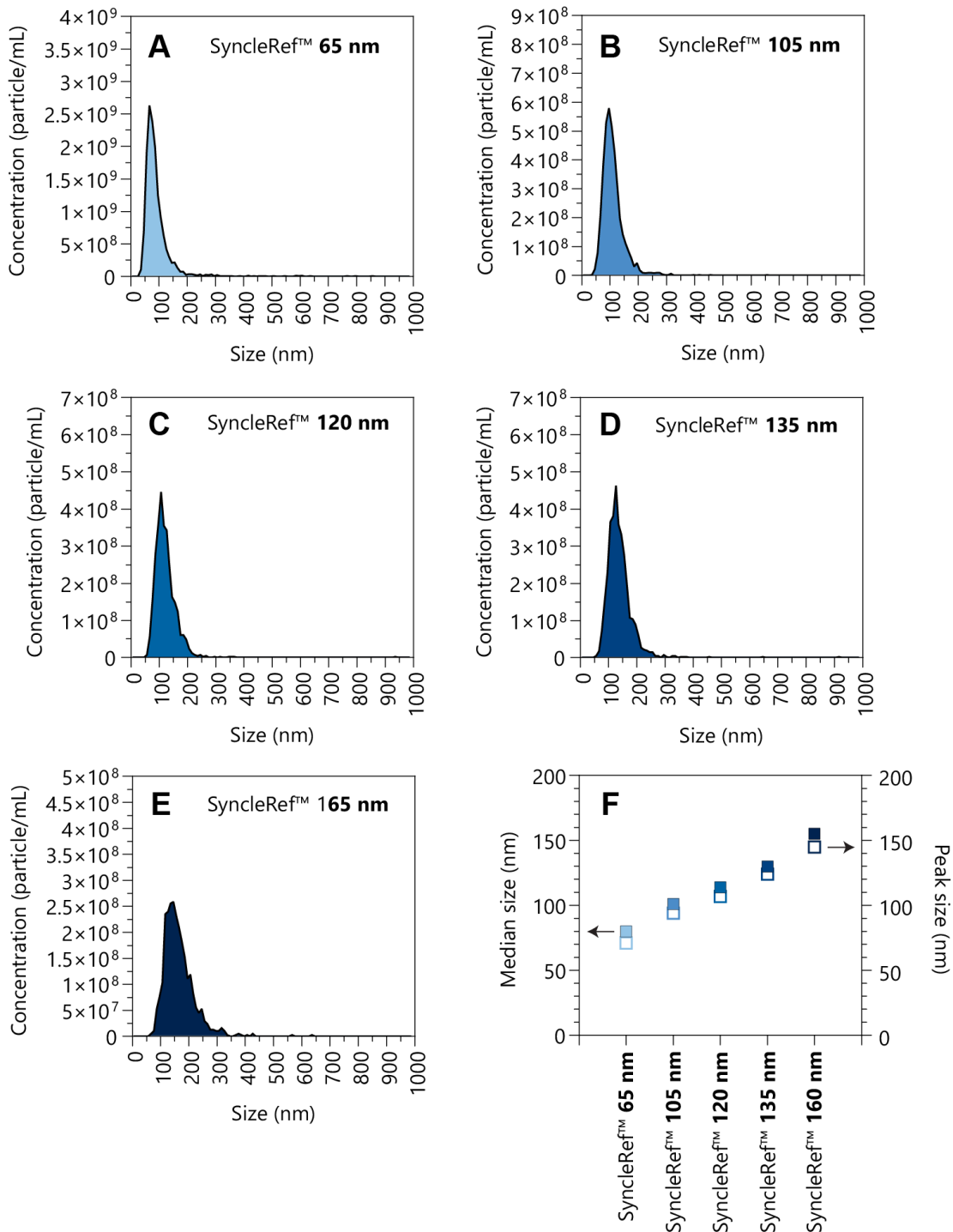
**Nanoparticle characterization data**



**Figure 1.** (A) Particle size distribution (PSD), (B) Z-average hydrodynamic diameter and polydispersity index (PDI) of all SyncleRef™ products acquired on a Malvern Zetasizer Ultra Red at a particle concentration of  $\geq 1E9$  particles/mL. Dashed lines are shown to guide the eye.



**Figure 2.** (Unstained) transmission electron microscopy (TEM) image of SyncleRef™ (A) 65 nm, (B) 105 nm, (C) 120 nm, (D) 135 nm, and (E) 165 nm. Contrast inversion was applied to accentuate the membrane structure of SyncleRef™. Note that, like all vesicle systems, the membrane structure of SyncleRef™ has a tendency to deform and buckle upon drying—this effect is typically more pronounced for larger vesicles (>100 nm). In other words, the non-spherical appearance observed is simply an artifact of drying. Scale bars are identical in all five images.



**Figure 3.** Nanoparticle tracking analysis (NTA) of SyncleRef™ (A) 65 nm, (B) 105 nm, (C) 120 nm, (D) 135 nm, and (E) 165 nm. Data was collected on a ZetaView® x30 QUATT at particle concentrations of  $10^7$ - $10^8$  particles/mL. (F) Summary of median size and peak size for all SyncleRef™ products. Acquisition settings for SyncleRef™ 65 nm and 105 nm were: Sensitivity = 80, Shutter = 500, Frame rate = 30, Minimum trace length = 10. Settings for SyncleRef™ 120 nm, 135 nm and 165 nm were: Sensitivity = 70, Shutter = 200, Frame rate = 30, Minimum trace length = 15.

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## Shipping & Storage Information

SynclereRef™ is shipped under ambient conditions, as Syncleres™ are stable at room temperature (20-25 °C) without any loss in particle quality. For routine, short-term use, the product may be kept at room temperature. For long-term storage, we recommend storing SynclereRef™ at 4 °C to enhance shelf life. If stored as directed, product performance will be maintained for at least 12 months from the date of receipt. If microbial growth is a concern, users may add sodium azide to a final concentration of 0.02% (w/v). **Important: Do not freeze!** Freezing disrupts the membrane structure of SynclereRef™ and leads to irreversible aggregation.

## Product Use Statement

All products sold by Vesiculate are for research use only (RUO), and are not intended for use in humans or diagnostic purposes.

## Quality Guarantee & Claims Policy

Vesiculate warrants that its products will meet the specifications described in each product's Certificate of Analysis (CoA). We are committed to providing a clear path to a swift resolution for any issues. Please inspect your order carefully upon arrival. Any claims for shipping damage, incorrect items, or shortages must be reported to Vesiculate within three (1) business days of delivery. All claims of non-conformance must be reported within 30 days of receiving your order. To validate a claim, we require that you provide technical information and data regarding the issue. Our support team will review your protocol and may offer suggestions. For any confirmed claim (shipping or performance), Vesiculate will, at its sole discretion, either replace the product at no cost or issue a full refund of the original purchase price.

## Returns Policy

As a standard policy for quality control, all sales are final and products are generally non-returnable. The following are the only exceptions: (i) For nonconforming products, Vesiculate may require the return of a product to validate a claim. To ensure the cost of your return shipment is eligible for a full refund, we recommend using a standard tracked postal service. If the product is confirmed by Vesiculate to be non-conforming, this return shipping cost will be fully refunded to you. (ii) For customers in Australia, products ordered in error may be eligible for return if reported within thirty (30) days. The product must be unopened and unused. For these returns, the purchaser is responsible for all return shipping costs and a 20% restocking fee.

## Limited Liability & General Terms

This guarantee is non-transferable and applies only to the original purchaser. The extent of Vesiculate's liability is strictly limited to the replacement of the product or a refund of the original purchase price. Vesiculate is not liable for any other damages or losses, including costs associated with other materials or labor. This limited warranty is the sole and exclusive warranty offered; Vesiculate disclaims all other warranties, express or implied. Please allow up to three (3) weeks for delivery. Product price and description are subject to change without notice. Vesiculate is not liable for any errors on this document or its website and is committed to keeping all customer information confidential.

## Contact Information for Ordering and Technical Support

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