COSMO BIO USA
Inspiration for Life Science

Detection of Extracellular Vesicles Using an Immunochromatography Kit

CASE STUDY

PRODUCTS USED

DNT
DAI NIPPON TORYO

- Exorapid-qIC Immunochromatographic kit for extracellular vesicles (CD9) (Cat. No.DNT-EXO-K01)
- Exorapid-qIC Immunochromatographic kit for extracellular vesicles (CD63)(Cat. No.DNT-EXO-K02) Manufacturer: Dai Nippon Toryo Co., Ltd.

EVALUATOR

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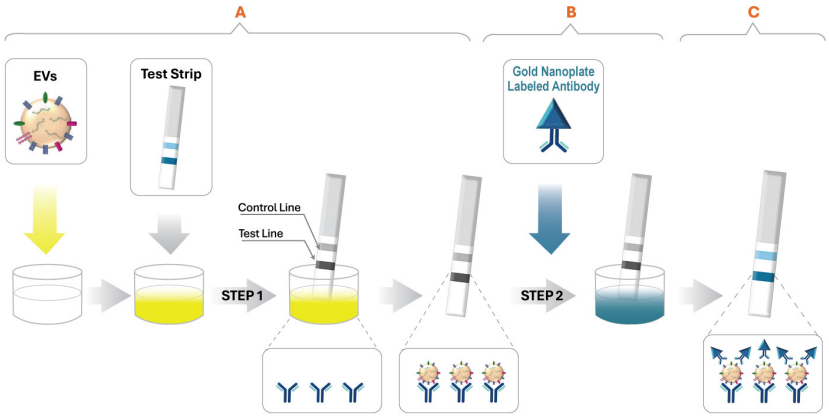
Exorapid-qIC Immunochromatographic Kit for Extracellular Vesicles (CD9/CD63/CD81)

Ideal for Starting EVs Research and Preliminary Evaluations

This research-use-only immunochromatography kit, developed by Dai Nippon Toryo Co., Ltd., is based on blue-colored noble metal nanoparticles, “Gold Nanoplates,” and enables the detection of extracellular vesicles (EVs), including exosomes, microvesicles, apoptotic bodies, and large oncosomes.



A. Antibodies immobilized on the test paper capture the EVs in sample.
B. Gold nanoplate labeled antibody binds to the EVs immobilized on the test strip in step (a).
C. A blue lines is visually confirmed by gold nanoplate labeled antibodies bound to EVs.

*This product was co-developed with Shimadzu Corporation.
*The antibodies used in this kit are from Cosmo Bio as listed below.
CD9 Antibody (12A12, Cat. No.: CAC-SHI-EXO-M01)
CD63 Antibody (8A12, Cat. No.: CAC-SHI-EXO-M02)
CD81 Antibody (12C4, Cat. No.: CAC-SHI-EXO-M03)

EXPERIMENTAL DETAILS

Exosomes and other small extracellular vesicles (sEVs) are vesicles approximately 100 nm in diameter, surrounded by a lipid bilayer, and secreted by all living cells. sEVs contain a variety of bioactive molecules, including nucleic acids, proteins, lipids, and metabolites, and are known to mediate specific intercellular communication. Capturing the characteristics of sEVs derived from cancer cells holds promise for their use as cancer diagnostic markers.

In the course of sEV research, there are many situations where reducing workload and conducting analyses more efficiently is desirable. This is particularly the case when the number of samples increases or experiments must be carried out within limited time and personnel, where the labor and time required for handling can become a challenge. Although widely used, methods such as Western blotting and ELISA can be influenced by factors such as equipment requirements, reaction times, the number of procedural steps, and the operator's level of experience, which can affect overall efficiency.

Various sEV quantification kits have recently become available; among them, we attempted experiments using the "Exorapid-qIC Immunochromatography Kit for Extracellular Vesicles," which allows for simple operation and rapid detection. sEVs recovered from the culture supernatant of the human ovarian adenocarcinoma cell line CAOV3 were used as the samples.

Experiment 1: Evaluation of sEVs Secreted by CAOV3

Using kits targeting CD9 and CD63, we confirmed that sEVs secreted by the CAOV3 cell line could be detected in less than one hour with either kit. Based on particle counts measured by nanoparticle tracking analysis (NTA), the test line became visible when the number of particles per test exceeded 1×10^8. Additionally, the trends in CD9 and CD63 detection intensity observed in this study correlated with the detection results for CAOV3 reported in the literature.

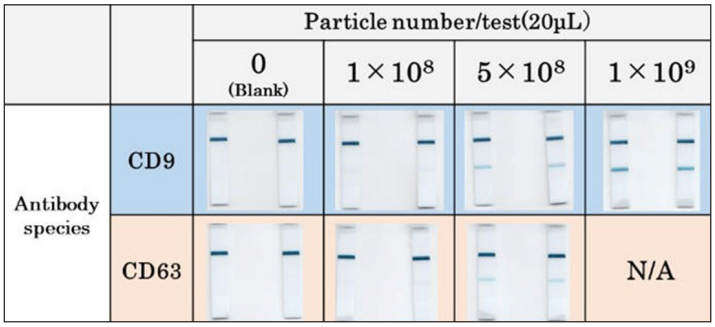


Figure 1. Immunochromatographic test of CAOV3-sEV (CD9/CD63)

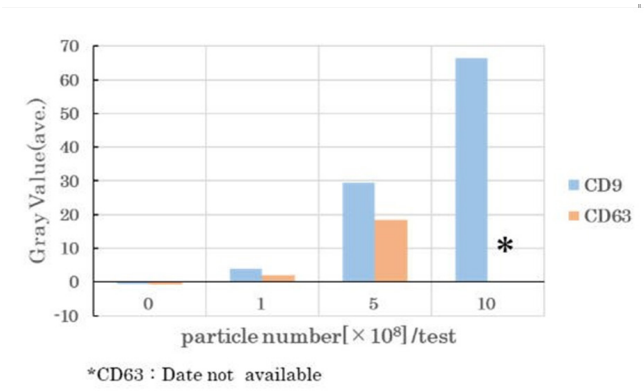


Figure 2. Gray value analysis of the lower line (test line) on the test strip

Experiment 2: Comparison of CAOV3-Derived sEV Lots

sEVs prepared on different dates were adjusted to the same concentration based on NTA measurements and evaluated. Differences in CD9 detection intensity were observed. This simple evaluation method enabled the detection of batch-to-batch variability that might be overlooked by NTA analysis alone.

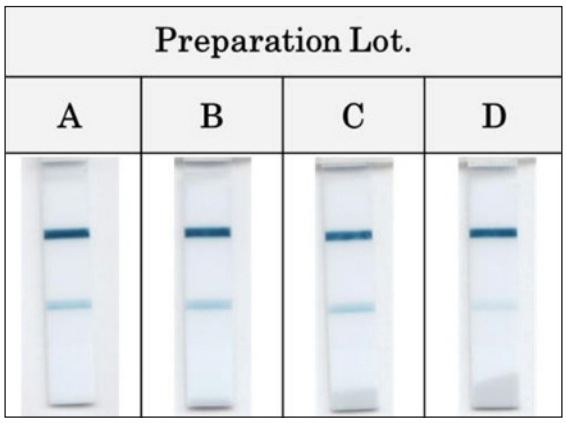


Figure 3. Immunochromatographic test of CAOV3-sEV (CD9)

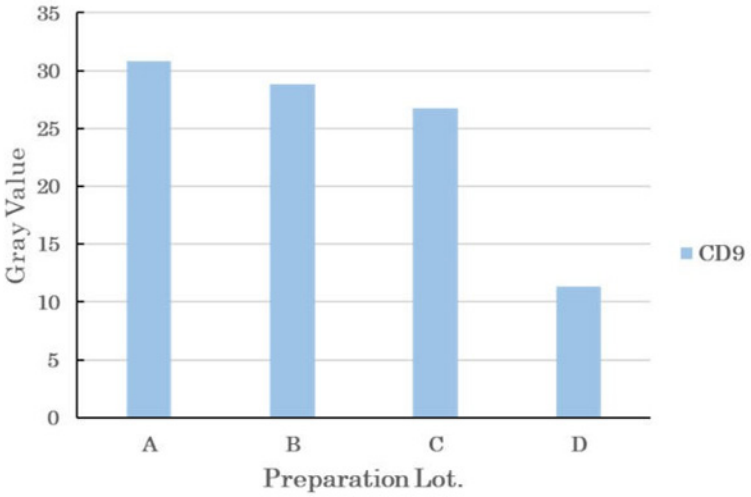


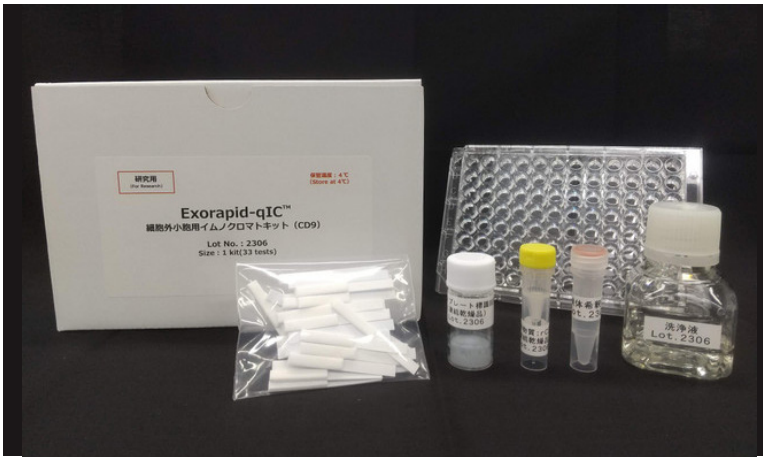
Figure 4. Gray value analysis of the lower line (test line) on the test strip

Conclusion

Using this kit, sEVs secreted by the human ovarian cancer cell line CAOV3 could be easily detected in a short time. However, even sEV fractions prepared from cultures under similar conditions can exhibit variability, highlighting the importance of evaluating sEVs using multiple methods.

For more information about:
Exorapid-qIC Immunochromatographic Kits for EVs, visit the DNT supplier page on Cosmo Bio USA's website:

cosmobiousa.com/suppliers/dai-nippon-toryo



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