LabSpinner
ExoDiscovery

Dunn Labortechnik

# ExoDiscovery® / ExoDisc® System
## and ExoPrism® Reagent Kits

**Rapid Isolation** of **Intact Extracellular Vesicles (EVs)**

Product Information

ExoDiscovery® & ExoDisc®

TFF (Tangential Flow Filtration)
on non-sticky nano-filter

### ExoDiscovery® / ExoDisc®
***Semi-automated System***

- *Easy-to-Use* benchtop device and cartridges (discs)
- *Rapid and label-free* isolation of *intact Exosomes / EVs*
- *High yield* and *high purity* nano-filtration technology
- Applicable for *cell culture supernatant (CCS), plasma, serum, CSF etc.*

### ExoPrism®

- *Reagent kits for enrichment and purification of Exosomes / EVs*
- *Rapid and scalable isolation of intact Exosomes / EVs*
- *High yield* and *high purity by selective precipitation*
- Two kits available for
  1. *CCS and Urine* and
  2. *Plasma and Serum*

ExoPRISM®

EV-enriched coagulation
by colloid chemistry

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# ExoDiscovery® / ExoDisc®

## *Semi-Automated Exosome / EV Isolation System*

The ExoDiscovery® rotor device is an easy-to-handle tabletop centrifuge **for rapid isolation of nanoscale extracellular vesicles (EVs).** Using a disposable ExoDisc® -D20 or -D100 cartridge and a pre-defined, optimized isolation protocol the user can easily isolate EVs **>20 nm** or **>100 nm** from a variety of biological sample such as plasma, serum, urine, cerebrospinal fluid (CSF) etc. in as short as 15 - 60 minutes.

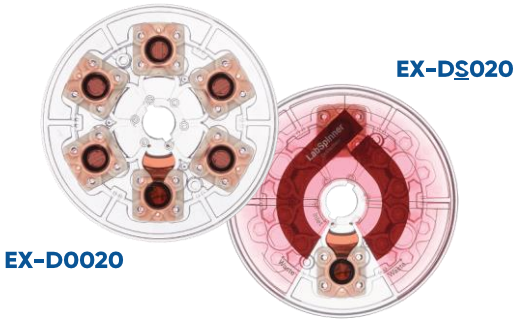
Because of the gentle isolation conditions (low centrifugal force: < 500 xg) and patented filtration technology used, ExoDiscovery® provides *high yields <u>of high purity intact EVs</u>* for sensitive downstream analyses (e.g. NTA, SEM, TEM, western blotting, ELISA, DNA/RNA prep for qPCR, or sequencing) and is ideal for precision science and research applications.


**Cat.-No. EX-R1001**

### ExoDiscovery®
***semi-automated rotor device***

**<u>Key Features:</u>**

- Easy setup via touch screen display
- Embedded user protocols for semi-automated operation with ExoDiscs®
  (No pre-treatment or labelling of samples required.)
- Rapid (15-60 min total time) and gentle (< 500 xg) isolation of intact EVs with high purity and high yield)
- Compact design:
  W X D X H: 25 cm x 40 cm x 15 cm
- Weight: 6 kg
- Power: 30 W (100-240 V, 50-60 Hz)

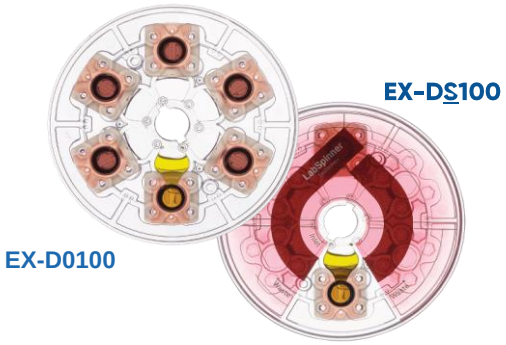



**Cat.-No. EX-D0020 & EX-D<u>S</u>020**

### ExoDisc® - D20
***for CCS/Urine/CSF/Bronchial Wash***

- **EX-D0020**:
  - 6 identical filters (up to 6 samples at once)
  - 1 ml/load/filter
- **EX-D<u>S</u>020** (Sterilized) [upon request]
  - 1 filter for single-use
  - 1 ml/load

* Each single filter can be loaded multiple times depending on the particle concentration of the sample (n > 4 in general)




**Cat.-No. EX- D0100 & EX-D<u>S</u>100**

### ExoDisc® - D100
***for Plasma/Serum/Other***

- **EX-D0100**:
  - 6 identical filters (up to 6 samples at once)
  - Protein-crowned EVs in plasma/serum
    : 0,1 ml/load/filter
  - Normal large EVs (>100 nm) : 0,1 ml/load/filter
- **EX-D<u>S</u>100** (Sterilized) [upon request]
  - 1 unit for single use

# ExoPrism®

## *EV Reagent Kits for Biological Samples*

The two types of ExoPrism® (**Exo**some **PR**ecipitation by **I**onic **S**trength **M**odulation) Kits offer sample specific **quick, scalable and customizable protocols** for *high yield and high purity* EV isolation.

Using a *selective precipitation protocol*, in combination with standard *100 kDa MWCO centrifuge filter tubes* (e.g. Amicon®, Vivaspin® or Pierce™)* and a laboratory centrifuge preparations of most EVs are obtained from CCS, Urine, CSF, BW or Plasma/Serum while biological functions of isolated EVS are preserved. The used non-PEG reagent can be easily removed by washing.

* Consumables like standard 15 or 50 ml sampling tubes and centrifuge filter tubes (MWCO 100 kDa) are not included in the reagent kits.


### ExoPrism® Kits

**Key Features:**

- Rapid (30-90 min total time)
- High yield (> 85% recovery)
- High functionality with only two reagents
- Scalable sample volumes
- Two kits optimized for EV isolation from different biological samples
  (see description below for more details)


**Cat.-No. EP-CU020**

### ExoPrism® for *CCS* and *Urine*

**EP-CU020**:

- Scalable sample volume (1 ~ 100 mL/kit)
- **Reagent B** (Precipitation solution)
  Sample : Reagent B = 1:1
- **Reagent C** (Rinsing solution)


**Cat.-No. EP-PS020**

### ExoPrism® for *Plasma* and *Serum*

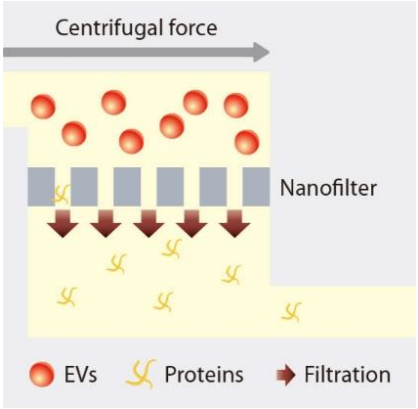
**EP-PS020**:

- Scalable sample volume (0.1 ~ 20 mL/kit)
- **Reagent P** (Precipitation solution)
  Sample : Reagent B = 1:0.8 (nucleic acid analysis) or 1 : 0.3 (protein analysis)
- **Reagent Q** (Rinsing solution)

# ExoDiscovery®/ ExoDisc® Technology

***Rapid, Gentle and Lable-Free Isolation of Extracellular Vesicles (EVs)***

Outstanding performance to obtain intact EVs from various biological samples:
**Cell culture supernatant (CCS), Urine, Plasma/Serum Bronchial Wash (BW) etc.**




Tangential Flow Filtration (TFF) through a nanofilter by FAST* allows gentle but efficient separation under greatly reduced pressure (<500 xg) compared to other isolation methods.

*FAST: Fluid-Assisted Separation Technology (patented)

## ► ExoDiscovery® / ExoDisc® Features

- Rapid operation
- Small formfactor
- Simple steps

- Label-free, intact EVs
- High yield
- High purity
- Gentle (< 500 xg)

- Small sample volumes
- No pretreatment step
- 6 samples per disc

## ► User-friendly Operation: 3 Simple Steps

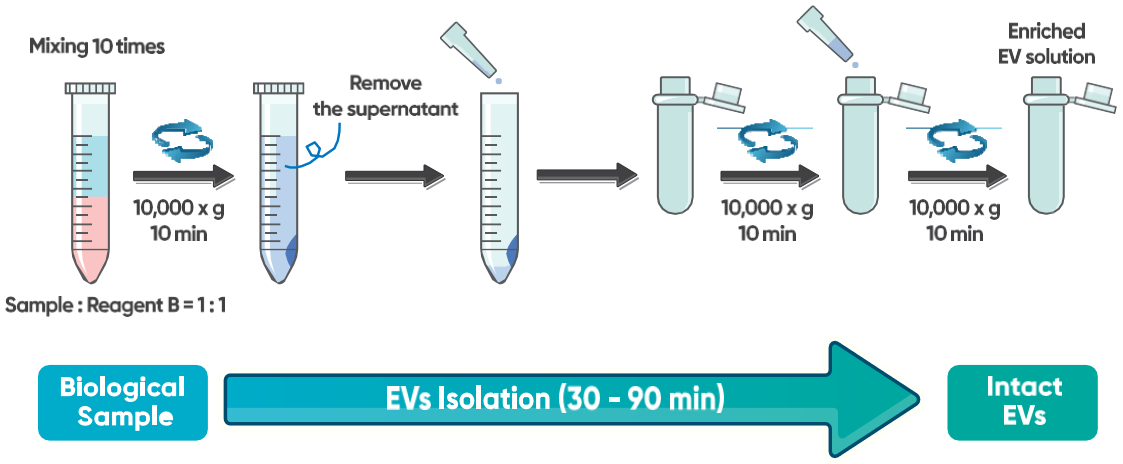

**Time: ~15 – 40 min**

## ► Advantages compared to other common methods

| Methods | ExoDiscovery™ | Ultracentrifugation | Precipitation | Immunocapture |
|---|---|---|---|---|
| Recovery | ●●● | ● | ● | ● |
| Purity | ●● | ● | ● | ●●● |
| Intact EVs | Y | Y | Y | N |
| Time | 10 ~ 40 min | 3 ~ 9 h | 2 ~ 12 h | 4 ~ 20 h |
| Max. G-force | 500 | 150,000 | 1,500 ~ 10,000 | - |

# ExoPrism® Principle

***EV Isolation Kits for Biological samples***

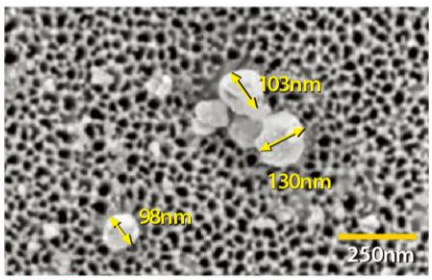



Isolation of intact EVs by precipitation/washing using LabSpinner ExoPrism® Kits (Example: ExoPrism® Kit for Cell Culture Supernatant and Urine Samples)

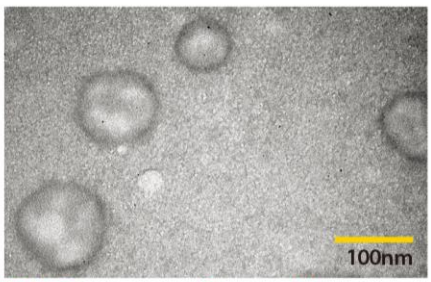
**Exo**some **PR**ecipitation by **I**onic **S**trength **M**odulation, (**ExoPRISM**) is a quick, scalable, and customizable EV isolation method for high yield and high purity preparation of intact exosomes / EVs.

Selective precipitation leads to concentration of most EVs while preserving their biological functions. The employed (Non-PEG) reagent is removed by subsequent washing steps employing standard 100 kDa MWCO centrifuge filter tubes. Depending on the type of sample, EV concentration and the used ExoPrism® Kit, EV preparations are typically obtained in only 1 to 1.5 hours.

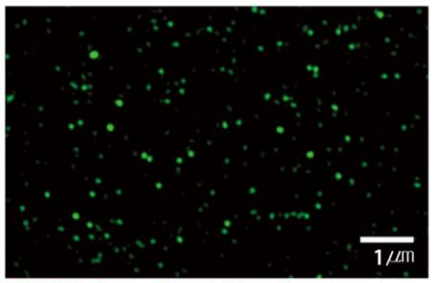
## ► Purified Intact Extracellular Vesicles (Microscopic Analyses, Examples)



SEM_Scanning Electron Microscopy

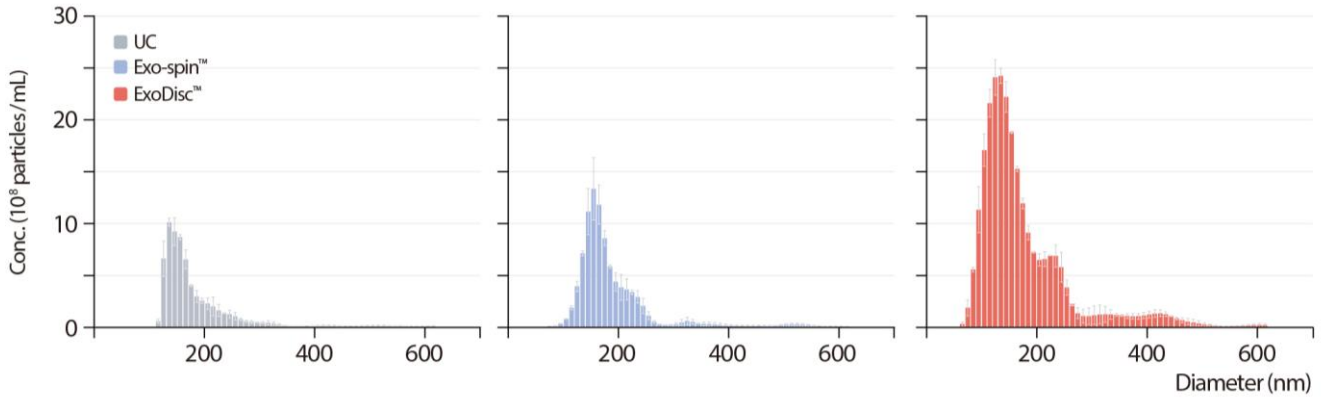


TEM_Transmission Electron Microscopy



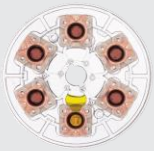
SR-SIM_Super Resolution-Structured Illumination Microscopy

## ► High Yield (Example: ExoDisc® compared with other isolation methods)



# User Application Guide

***Sample Type, EV size and product specific recommendations***

| | | | | | | |
|---|---|---|---|---|---|---|
| **Product** | **ExoDisc -D20** | **ExoDisc -D20S** | **ExoDisc -D100** | **ExoDisc -D100S** | **ExoPRISM for CCS/Urine** | **ExoPRISM for Plasma/Serum** |
| |  |  |  |  |  |  |
| | **Unsterilized** | **Sterilized** | **Unsterilized** | **Sterilized** | **Unsterilized** | |
| **EV size** | **> 20 nm** | | **> 100 nm** | | **Size independent** | |
| **Sample Type** | **CCS, Urine** | | **Plasma, Serum** | **Others** | **CCS, Urine** | **Plasma, Serum** |
| **Sample Volume** | **≤ 30 mL per Disc** | **≤ 5 mL per Disc** | **≤ 1.2 mL per Disc** | **≤ 5 mL per Disc** | **≤ 100 mL per Kit** | **≤ 20 mL per Kit** |
| **Time*1** | **30 min** | | **1 hr** | | **1 hr** | **1.5 hr** |
| **Platform** | **ExoDiscovery**  | | | | **Centrifuge**  | |

*1 The operation time depends on the EV concentration in the sample.

# Literature / References

***Selection from Peer-reviewed Journals***

## ExoDisc®


1. Exodisc for Rapid, Size-Selective, and Efficient Isolation and Analysis of Nanoscale Extracellular Vesicles from Biological Samples, **ACS Nano** 2017 Feb 28:11(2):1360-1370, DOI: 10.1021/acsnano.6b06131

2. FAST: Size-selective, Clog-free Isolation of Rare Cancer Cell from Whole Blood at Liquid-Liquid Interface, **Analytical Chemistry** 2017 92(8):6010-6018, DOI: 10.1021/acs.analchem.6b03534

3. Urine-based Liquid Biopsy: Non-invasive and Sensitive AR-V7 Detection in Urinary EVs from Patients with Prostate Cancer, **Lab Chip** 2018 Dec 18;19(1):87-97, DOI: 10.3389/fonc.2022.759791

4. Fully automated, lable-free isolation of extracellular vesicles from whole blood for cancer diagnosis and monitoring, **Theranostics** 2019 Mar 7:9(7)1851-1863, DOI: 10.7150/thno.32438

5. Detection of EGFR Mutations Using Bronchial Washing-Derived Extracellular Vesicles in Patients with Non-Small-Cell Lung Carcinoma, **Cancers** 2020 Sep 30;12(10):2822 DOI: 10.3390/cancers12102822

6. Comprehensive evaluation of methods for small extracellular vesicles separation from human plasma urine and cell culture medium, **Journal of Extracellular Vesicles** 2020 Dec;10(2):e12044 DOI: 10.1002/jev2.12044


## ExoPrism®


1. EV-Ident: Identifying Tumor-Specific Extracellular Vesicles by Size Fractionation and Single-Vesicle Analysis, **Analytical Chemistry** 2020 Apr 21;92(8):6010-6018 DOI: 10.1021/acs.analchem.0c00285

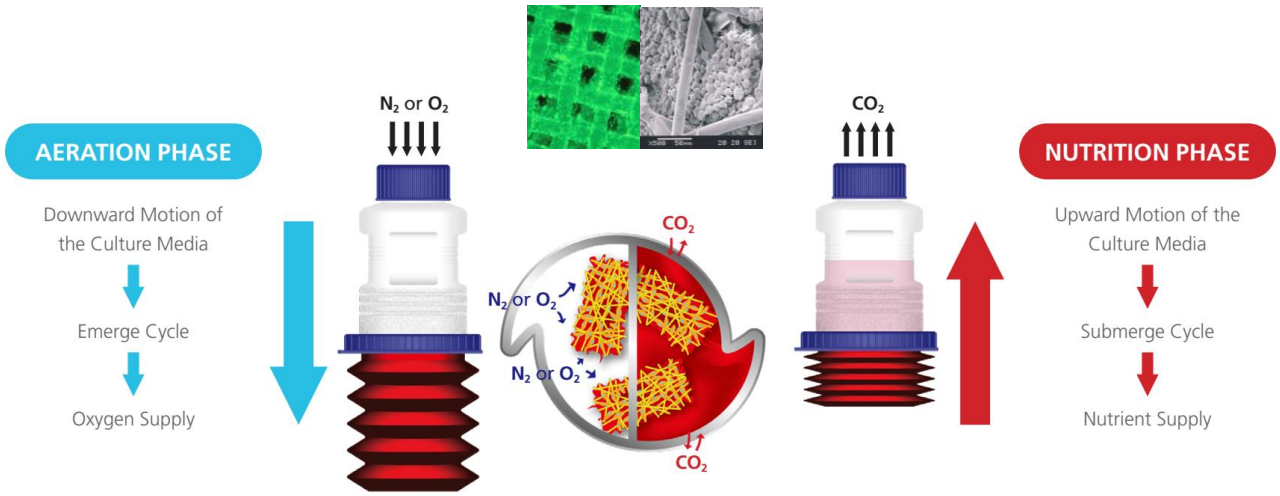
2. Exosome Precipitation by Ionic Strength Modulation: ExoPRISM, **Applied Materials & Interfaces** 2023 Nov 28;15(49);56807-56819, DOI: 10.1021/acsami.3c13527

# Also available from Dunn Labortechnik:

Scalable **BelloCell® Adherent Cell - Tide Motion Bioreactor Systems** from Esco Bioengineering for a broad range of *Adherent Cell Culture Applications* and for the **Production of Exosomes / EVs**.

**BelloCell® „Batch“ Culture System**

**BelloCell® Continuos Culture System**




**Tide motion principle:** Low sheer-stress and at the same time optimal supply of nutrients and oxygen by alternating exposure of adherent growing cells to cell culture medium and oxygen (gas atmosphere).

**Please contact us for more information or an individual offer!**

**Also on Offer from Dunn Labortechnik:**

**A wide selection of Cell Culture Incubators**

**from N-Biotek and ShelLab/Sheldon Manufacturing.**