qEV EXTRACELLULAR VESICLE ISOLATION

IZON

www.izon.com

RAPID, HIGH PRECISION EXOSOME ISOLATION

qEV provides the most rapid and effective extracellular vesicle (EV) isolation system available. qEV is based on size exclusion chromatography (SEC), and takes as little as 15 minutes to get a pure sample of intact exosomes, significantly purer than is possible with concentration methods such as ultra-centrifugation (UC) or precipitation reagent kits. The resulting samples are consistent, standardisable, and repeatable. qEV is now the gold standard for exosome isolation.

Rapid, Simple & Reliable

With qEV it takes as little as 15 minutes to get a pure sample of intact exosomes. Reliability has been proven in a large scale inter-laboratory trial.

Standardisable & Reproducible

Each column is stardardised, quality assured and certified to the ISO13485 standard (Medical Devices).

Pure, Clean Isolation Samples

qEV columns provide clean and pure samples without affecting the structure or function of the vesicles.

RAPID. GENTLE. PRECISE.

Rapid. Gentle. Precise.

qEV offers fast, gentle & precise isolation of exosomes and other EVs, removing more than 99% of soluble proteins. This makes qEV-isolated vesicles suitable for electron microscopy, proteomics, RNA analysis, and physical measurement.

ISO 13485 Certified

Quality certified to ISO 13485: 2016 – Medical Devices

Pure

Removes › 99% of soluble proteins

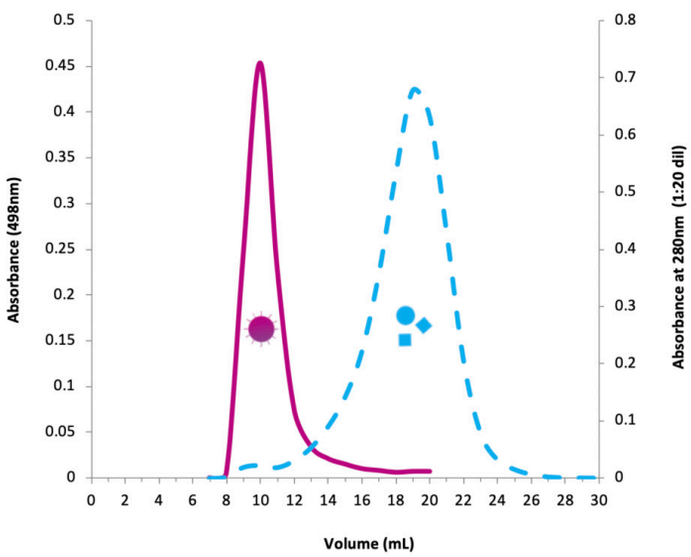
Optimised For Your Research

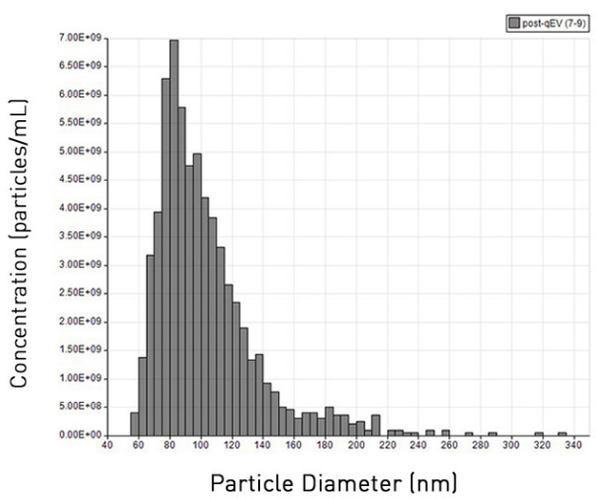
The rapidly growing qEV range now includes 10 different columns.

THE NEW STANDARD IN EV ISOLATION

Prior to the advent of SEC columns, UC was regarded as the gold standard for EV concentration and isolation. UC is time consuming and cannot provide a consistent standardised sample. The very high forces in UC, up to 200,000g, affect, disrupt and aggregate the vesicles, which may in turn invalidate much of the research. Moreover, aggregated proteins and nucleic acid contaminants are present in the pellet containing the EVs. Density gradient centrifugation (DGC) aims to improve the purity of UC derived exosomes but increases the complexity and time of the procedure even further. Standardised sampling across different laboratories is not achievable with either UC or DGC.

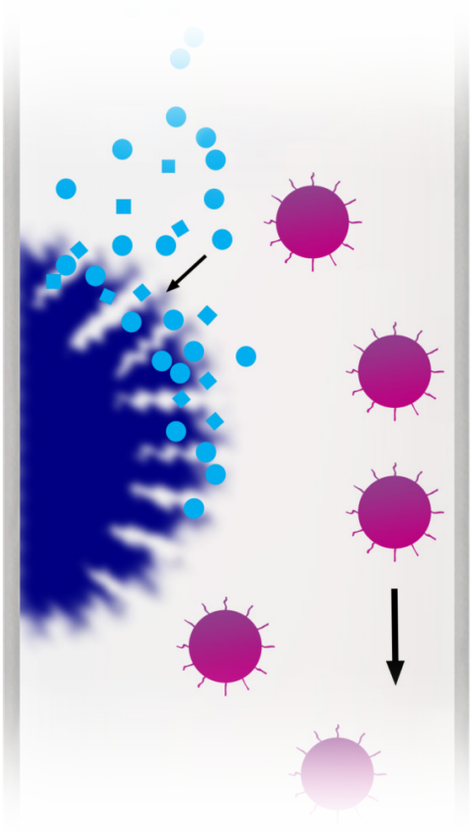
Precipitation reagent kits have been adapted for exosome/EV purification. They are typically PEG based and sediment a wide range of product, not just EVs. Published independent data indicates these fractions are heavily contaminated with non-EV material because these reagents cause co-precipitation of proteins, lipoproteins and other biological components. qEV SEC columns provide clean samples without affecting the structure or function of the EV. Precipitation reagent kits provide dirty samples that vary from batch to batch. The leading researchers in the EV field no longer use or recommend precipitation products.


Absorbance (498nm)
Absorbance at 280nm (1:20 dil)
Volume (mL)
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30


post-qEV (7-9)
Concentration (particles/mL)
Particle Diameter (nm)
7.00E+09
6.50E+09
6.00E+09
5.50E+09
5.00E+09
4.50E+09
4.00E+09
3.50E+09
3.00E+09
2.50E+09
2.00E+09
1.50E+09
1.00E+09
5.00E+08
0.00E+00
40 60 80 100 120 140 160 180 200 220 240 260 280 300 320 340

HOW qEV ISOLATION WORKS

qEV is based on size exclusion chromatography (SEC). Size exclusion chromatography uses a stationary phase consisting of porous resin particles. Molecules smaller than the isolation range (35nm+ or 70nm+) are slowed because they enter into the pores of the stationary phase. Larger particles which cannot enter the pores flow around the resin and are eluted from the column earlier. Molecules and small particles that enter the pores have longer retention times and elute later.



CHOOSE A VESICLE ISOLATION COLUMN OPTIMISED FOR YOUR RESEARCH

There are currently 5 different Izon columns sizes to choose from, each available in 2 isolation ranges (designated 35 or 70). As each column has its own advantages, we'll guide you through the process of choosing the right one for your research. The important selection considerations are sample volume and expected particle sizes. All 10 of our columns benefit from our ISO 13485:2016 certification.

STEP 1 – CHOOSE YOUR COLUMN SIZE

qEVsingle

‹ 150 µL

Sample loading (recommended for highest purity).

- **Ideal for clinical samples, RT-PCR**

  Optimised for small samples. No RNA carryover.

- **Single Use**

  Cost efficient.

  ISO 13485 Certified.

qEVoriginal

‹ 500 µL

Sample loading (recommended for highest purity).

- **Ideal for higher volume research**

  The original, and most popular qEV column.

- **Reusable**

  Up to 5 times.

  ISO 13485 Certified.

qEV2

‹ 2 ml

Sample loading (recommended for highest purity).

- **Ideal for larger clinical samples & RNA preparation**

  Includes Leur Lock fitting.

- **Reusable**

  Up to 5 times.

  ISO 13485 Certified.

qEV10

< 10 ml

Sample loading (recommended for highest purity).

- **Ideal for large volume cell culture supernatant**

  Includes Leur Lock fitting.

- **Reusable**

  Up to 5 times.

  ISO 13485 Certified.

qEV100

< 100 ml

Sample loading (recommended for highest purity).

- **Ideal for large volume cell culture supernatant**

  Includes Leur Lock fitting.

- **Reusable**

  Up to 5 times.

  ISO 13485 Certified.

STEP 2 – CHOOSE YOUR ISOLATION RANGE

Each of the four different column sizes is now available in two isolation ranges (35nm+ and 70nm+). The popular 70nm+ qEV columns have an optimum recovery of particles from 70nm to 1000nm, while the newer 35nm+ columns have an optimum recovery range of 35nm to 200nm.

qEV / 35nm

- **35nm - 200nm**

  Optimum Recovery Range

- **<110nm**

  Higher recovery of EVs smaller than 110nm

- **More Lipoprotein Overlap**

  When working with blood plasma

qEV / 70nm

- **70nm - 1000nm**

  Optimum Recovery Range

- **>110nm**

  Higher recovery of EVs larger than 110nm

- **Less Lipoprotein Overlap**

  When working with blood plasma

qEV FREQUENTLY ASKED QUESTIONS

How many times can qEV columns be reused?

All columns except for the qEVsingle can be reused up to 5 times depending on the type of sample used. Please see the qEV User Manual at http://support.izon.com for more information.

What type of blood collection tube should I use if I want to isolate EVs from blood products (plasma, serum, whole blood)?

There are many different types of blood collection tube available and the anticoagulant present in the tube can affect the functionality and quantity of EVs present in blood products. Please see our Tech Note on this topic at http://support.izon.com.

Can the qEV column be regenerated?

Columns can become clogged over time by samples with a high lipid content. Columns can be cleaned with 0.5M NaOH, however the effectiveness of this method will depend on the sample type being analysed. Izon recommends using a column no more than 5 times.

Why do some particles appear in the later fractions?

The speed of particles as they move through the column is heavily dependent on the resin type (pore size) and on the particle size. Particles that are smaller than the pores in the resin will enter the resin and their progress through the column will be slowed, hence they will appear in later fractions.

What column should I use for very small volumes of samples?

Izon recommends qEVsingle columns for sample volumes up to 150 µL. For more information on choosing a column type for your samples, please see our Technical Note on this topic at http://support.izon.com.

What is the minimum sample volume that can be used?

The lowest sample volume that can be processed is 100 µL with the qEVsingle. Sample volumes smaller than 100 µL can be used, but this will result in the particle volumes being diluted more than 6-fold.

Is it possible to tailor fractions so that they correspond to a specific size profile?

No. The column length is not long enough to achieve this type of resolution effectively.

Is it possible that the protein fractions will contain exosomes?

Yes. Depending on the size of the resin pores, particles that are smaller than the pores will enter the resin and their progress through the column will be slowed. Hence, these particles may appear in later fractions.

Are qEV columns sterile?

No. qEV columns are treated with a 0.5% sodium azide solution prior to sale, but they are not considered sterile.

Is it possible that the fractions containing extracellular vesicles will also contain apoptotic bodies?

Yes. If the apoptotic bodies have a similar size profile as the target particles, then it is possible that they will be contained in the same fraction.

How do I know which fractions will contain my target particles?

The fractions containing your particles of interest will vary based on the column type and gel being used. Please refer to the qEV User Manual that is specific for your column for more information at http://support.izon.com.

It appears that my sample does not pass through the whole length of the column by the time that I start collecting EV fractions. Is this to be expected?

Yes. Most samples will contain significantly more protein than EVs. The protein, which is usually the visible component, is slowed down by the pores in the resin, whereas the majority of EVs pass through without entering the resin. Thus, while it appears that the sample has not passed the full length of the column, the EVs can be collected in the appropriate fractions.

My column appears to flow more slowly after the second use, is this to be expected?

Yes. Lipids, denatured proteins, and other contaminants in the samples can block and bind the column, causing the flow rate to slow. Washing the column with 0.5M sodium hydroxide can remove some of these contaminants, however the effectiveness will depend largely on the type of samples being analysed. Izon recommends using a column no more than 5 times.

Can qEV columns be used to clean EV samples after they have been incubated with fluorescent labels or antibodies?

Yes. Fluorescent labels and antibodies are much smaller than EVs, so any free label will be separated from the EVs.

Are qEV columns ISO-13485 certified?

Yes, qEV columns are manufactured to the ISO-13485 standard.

What buffer should be used to store the column between uses?

The buffer that the column has been run with containing some form of antimicrobial compound such as sodium azide (0.05%).

What column should I use if I want to do RNA and DNA testing?

You can use any column size depending on your sample size, but Izon recommends only using a column once to avoid any cross-contamination.

How many columns come in a pack?

- qEV100 - 1 Column
- qEV10 - 1 Column
- qEV2 - 2 Columns
- qEVoriginal - 5 Columns
- qEVsingle - 20 Columns

Do you offer volume discounts?

Yes. Please contact your local Izon sales representative.

How many fractions will I get with each column?

This will depend on the column type, the fraction volume, and the number of fractions you choose to collect. The smaller the fraction volume, the more fractions will be needed. Please see the qEV User Manual for more information.

What is the difference between the 35nm and 70nm gels?

This is the size particles that are excluded by the column resin. qEV-35nm columns exclude particles larger than 35nm and qEV-70nm columns exclude particles larger than 70nm.

What protein quantification method do you recommend?

Izon recommends a chromogenic protein assay for protein quantification, such as a Bradford or Lowry assay. The type you choose will depend on the sensitivity required for your application.

How do I determine which column I should use for my application?

Please see our comprehensive qEV selection guide at http://support.izon.com for more information.

Does Izon have any information on sample preparation or collection prior to using qEV columns?

Yes. Please see our technical and application notes available on the Izon Support Centre at http://support.izon.com for more information.

What columns sizes can be used with the Automatic Fraction Collector (AFC)?

The qEVsingle, qEVoriginal, qEV2 and qEV10 can be used with the AFC.

LEARN MORE

FIND OUT MORE AND ORDER YOUR COLUMNS AT STORE.IZON.COM

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