avantor™ delivered by VWR™ | VWR.COM

CORNING

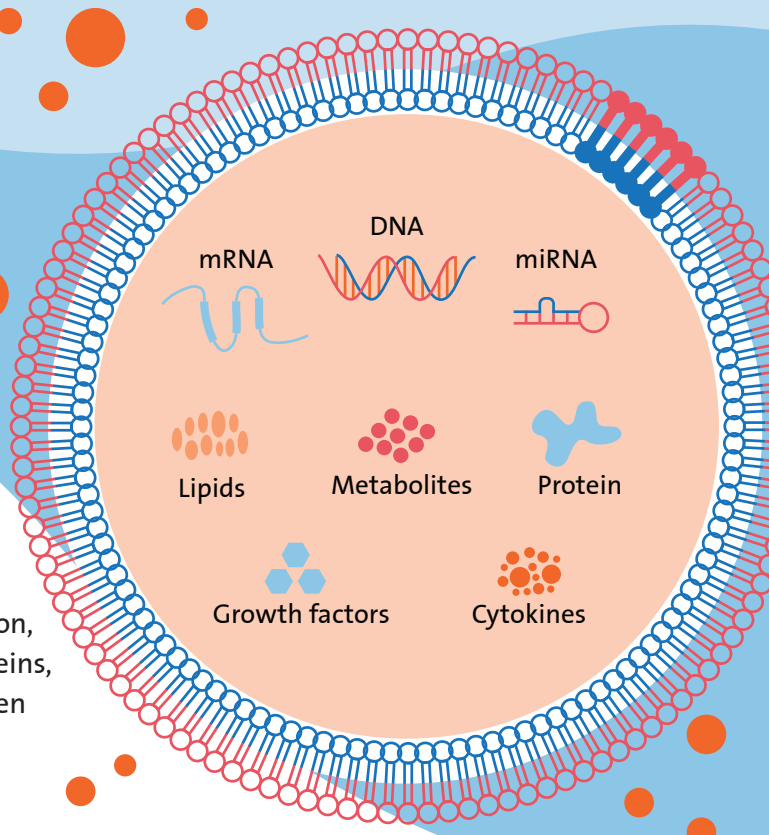
Extracellular Vesicles:

What They Are, Potential Applications, and Scaling Methods

How the "text messages" of cells could transform advanced therapies

Mesenchymal stem cells offer promise across various applications in regenerative medicine, but they have challenges. Can extracellular vesicles (EVs) tap into that promise with lower risk?

New research indicates they could.

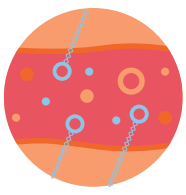


What Are EVs?

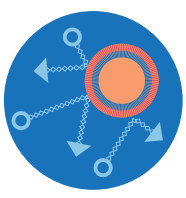
EVs are nano-sized vesicular particles that are naturally secreted by all cell types, including mesenchymal stem cells (MSCs). These particles are used for intercellular communication, like text messages, where the inside contents are sugars, proteins, and nucleic acids of the parent cell. A response protocol is then initiated by the recipient cell based on the contents of the message, reflecting the status of the parent cell.

What's Their Advantage?

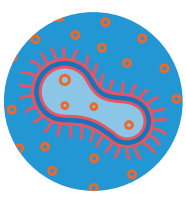
As acellular materials, EVs deliver the same paracrine factors as stem cells, without being subject to the same complexities. EVs can:



Pass through biological barriers where many cell therapy products cannot, such as the blood-brain barrier.



Avoid unwanted immune responses thanks to their nano-size and outer lipid membrane that protects the EV from the immune system.

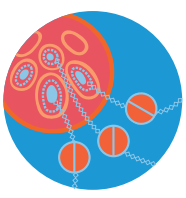


Minimize risk of spontaneous tumor growth or viral infection, as they cannot replicate.

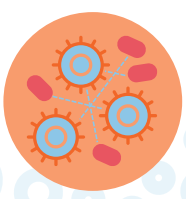
Where Could They Be Used?

EVs have both diagnostic and therapeutic applications.

Regenerative Medicine: EVs could help generate new tissue for genetic defects, burns and wounds, and organ damage.[1]



Oncology: Researchers can collect EVs via liquid biopsy and use diagnostic tools to study tumor behavior such as spread/metastasis. EVs can also be used as delivery vehicles for cancer therapeutics.[2]



Infectious Disease: Understanding EV message networks between pathogens and hosts may help inspire new techniques for controlling inflammation and stopping infection.[3]

How Do They Scale?

For therapeutic applications, EVs require a fast and robust scale-up strategy. Stem cells must first be scaled up, and then EVs are harvested from the surrounding media.

500 MILLION

Estimated amount of stem cells needed for a single dose of EV therapy[4]

800 MILLION

Estimated amount of stem cells possible from one Corning HYPERStack® 36-layer vessel[5]

Calculate your need. A typical dose might require millions of MSCs within a matter of days.

Assess your space. Determine how much growth area you currently have for adherent cells, as well as how much you might need.

Evaluate your platform. Consider compact and efficient options like Corning HYPER technology, which expands cells within a small footprint using multilayer vessels and stacks.

Mimic the natural environment. Reproduce physiological characteristics such as fluid movement and nutritional exchange to prompt EV production.[6]

Grow the MSCs necessary for sufficient EV harvest with HYPER technology.

vwr.com/corning

Warranty/Disclaimer: Unless otherwise specified, all products are for research use or general laboratory use only. Not intended for use in diagnostic or therapeutic procedures. Not for use in humans. For a listing of US medical devices, regulatory classifications or specific information on claims, visit www.corning.com/resources.

1. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4253973/
2. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8008708/
3. https://www.frontiersin.org/research-topics/11799/extracellular-vesicles-in-infectious-diseases
4. https://www.sciencedirect.com/science/article/pii/S1873506120302798
5. https://www.corning.com/worldwide/en/products/life-sciences/resources/stories/at-the-bench/optimizing-stem-cell-production-with-modern-day-lab-technologies.html
6. https://www.youtube.com/watch?v=dsKO10KYDJQ

CORNING

For additional product or technical information, visit **vwr.com/corning**, call 1.800.932.5000, or contact your representative.

avantor™ delivered by VWR™ VWR.COM

Prices, product, and/or services details are current when published and subject to change without notice. | Certain products or services may be limited by federal, state, provincial, or local regulations. | VWR, part of Avantor, makes no claims or warranties concerning sustainable/green products. Any claims concerning sustainable/green products are the sole claims of the manufacturer and not those of VWR International, LLC and/or Avantor, Inc. or affiliates. All prices are in US dollars unless otherwise noted. Offers valid in US and Canada unless otherwise noted, void where prohibited by law or company policy, while supplies last. | Trademarks are owned by Avantor, Inc. or its affiliates, unless otherwise noted. | Visit vwr.com to view our privacy policy, trademark owners, and additional disclaimers. © 2023 Avantor, Inc. All rights reserved.

For a listing of trademarks, visit www.corning.com/clstrademarks. All other trademarks are the property of their respective owners.
© 2023 Corning Incorporated. All rights reserved. 6/23 CLS-AN-706 VWR (0623 Lit. No. 030320W)

0623 Lit. No. 030320W