‘The potential here is huge’: Using exosomes to package and deliver drug therapy

Millions of tiny bubbles, released from cells and packaged with molecular mail, are racing through your bloodstream right now. And until recently, only a handful of researchers gave them any thought.

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Called exosomes, these lipid vesicles shuttle proteins and genetic information between both neighboring and distant cells.

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The vesicles are implicated in spreading diseases, including cancer, and metabolic conditions, like diabetes and obesity. A recent study even points to exosomes as a culprit for distributing amyloid-?, the plaque-forming protein that accumulates in the brains of people with Alzheimer’s disease. If exosomes can so easily carry molecules that spread disease, scientists began thinking they might be useful to carry molecules that stop disease.

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In many cases, it is not clear what molecules inside the exosomes have therapeutic properties, but several stem cell companies are pivoting to exosomes nonetheless. For example, Capricor Therapeutics, which was founded in 2005 to develop stem cell therapies derived from heart tissue, is now using exosomes derived from those same cells to try to treat cardiac and inflammatory conditions.

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“[T]hey are important in almost every aspect of biology and medicine,” [scientist Stephen] Gould once said. “The potential here is huge.”

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