

## Extracellular RNA



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**T**he molecule best known for its part in translating genetic code into protein-assembly instructions is finding a new role in medicine. RNA, once thought to exist only in cells, is now known to travel to tissues all over the body through the blood, under the protection of tiny lipid sacs known as extracellular vesicles. The study of this extracellular RNA (exRNA) has led to a quiet revolution in biology, as scientists endeavour to understand why cells release RNA, and how the molecules might be used to improve the detection and treatment of disease (see page S6).

Eavesdropping on the cellular communications encoded by exRNA could reveal early signs of diseases such as cancer. Various ways to track these extracellular snippets in body fluids are under development (S2). On the therapeutic front, RNA-carrying vesicles might offer a safer and simpler alternative to stem-cell therapy for cardiovascular, neurological and immunological disorders (S16). In particular, researchers are focusing on how to use vesicles that contain RNA to deliver drugs across the barrier that separates the bloodstream and the brain (S14). These natural vesicles have several advantages over the engineered nanoparticles that have received much more research attention (S5).

Beyond the potential clinical applications, exRNA could have intriguing implications for diet. One provocative study that linked RNA in what we eat to gene expression has kick-started vigorous efforts to learn the language in which our food speaks to us (S10). The link, however, remains unproven (S9). Related efforts are focusing on how RNA in breast milk affects infant health (S12).

In plants, a clearer understanding of the biological importance of exRNA is leading to methods to genetically modify some food plants to make them less vulnerable to disease (S19). And researchers across a range of biomedical fields are investigating how best to use exRNA (S20).

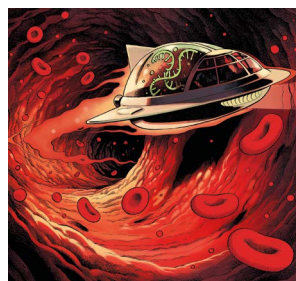
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**Herb Brody**

Chief supplements editor

**Contents**

- S2 DIAGNOSIS**  
Putting extracellular RNA to the diagnostic test
- S5 PERSPECTIVE**  
Viva la natural vesicle
- S6 RESEARCH**  
Loose translation
- S9 PERSPECTIVE**  
Dietary RNA is ripe for investigation
- S10 DIET**  
The doubts about dietary RNA
- S12 INFANT NUTRITION**  
Unravelling the mysteries of microRNA in breast milk
- S14 THERAPY**  
Hacking the body's delivery service
- S16 CELL BIOLOGY**  
Inside the stem-cell pharmaceutical factory
- S19 PLANT BIOLOGY**  
Planting the seed of RNA crosstalk
- S20 CLINICAL TRIALS**  
Research round-up

**On the cover**

A vesicle carrying RNA hurtles through the bloodstream  
Credit: David Parkins

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