

# BusinessWeek

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## Developments to Watch

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### **BOOSTER BUBBLES FOR ARTIFICIAL BLOOD**

FOR YEARS, SCIENTISTS HAVE worked to develop substitutes for human blood. So far, though, only one has government approval—and it can transport just 25% of the oxygen that whole blood can. Now, researchers at the University of Illinois, led by chemist Kenneth S. Suslick, have a promising prospect: microbubbles of hemoglobin, the oxygen-carrying protein in blood.

These bubbles can transport 50% more oxygen than the same volume of whole blood. The microbubbles, about half the size of red blood cells, are small enough to pass through the bloodstream, but aren't likely to damage the kidneys as earlier candidates have.

The bubbles, oxygen cores surrounded by a shell of hemoglobin molecules, are created by beaming

ultrasound waves at a water solution containing hemoglobin. The waves create tiny bursts of air into the protein solution, producing a froth of bubbles. The heat generated by the sound waves causes hot spots in the liquid, intense enough to break the chemical bonds of water. The resulting elements react with the hemoglobin to form the tiny spheres. Next step: Inject the spheres into animals to see whether they're toxic.