



Noninvasive Assay for Bovine Embryo Quality

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WARF: P150131US02

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in improving *in vitro* fertility success in dairy cattle using microRNAs as biomarkers for embryo quality.

Overview

Selection intensity for higher milk production in dairy cattle has contributed to a decline in fertility, posing a challenge to dairy producers. Despite technological advances, the pregnancy rate of cows following *in vitro* fertilization (IVF) is only 45 percent, with increased risk for abortion and stillbirth.

Conventionally, assessment of the quality and potential of embryos produced *in vitro* is largely based on morphology. However, morphologically similar embryos differ in developmental capacity likely due to underlying genetics. Moreover, the process is subjective and requires invasive sampling of the embryo and parental tissue.

There is clear and commercial opportunity for a noninvasive method that supports the efficient selection of high quality embryos. Such a method would improve the odds of successful IVF procedures, saving tens of thousands of dollars and reducing failed pregnancies.

The Invention

UW–Madison researchers have identified 11 microRNAs (miRNAs) and 18 mRNAs as indicators of healthy IVF embryo development. They discovered that the miRNAs are differentially expressed between bovine blastocyst-stage embryos and those that fail to develop ('degenerates'). This is the first report that miRNA levels in the culture medium differ among embryos of different developmental fate and can be used as indicators of embryo viability.

Applications

- Embryo transfer services for cattle
- Potential use for other mammals including human IVF

Key Benefits

- New method is noninvasive and nonsubjective.
- Potentially significant cost savings

Stage of Development

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Specifically, sequencing revealed 11 differentially expressed miRNAs in culture media conditioned by either blastocysts or degenerate embryos. By comparing the miRNAs from healthy embryos and those from degenerate embryos in three different IVF experiments, the researchers found that high expression levels of the 11 specific miRNAs in media correlated with degenerate embryo development.

Additional Information

For More Information About the Inventors

- [Hasan Khatib](#)

Related Technologies

- [WARF reference number P130089US02 describes 10 imprinted genes identified by the researcher that impact bovine embryo development.](#)

Tech Fields

- [Animals, Agriculture & Food : Animal health](#)
- [Medical Devices : Diagnostics & monitoring tools](#)

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