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Clones are erased and rebuilt

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A cloned cell nucleus has its gene expression program wiped clean before being reprogrammed as an embryonic nucleus by the egg into which it has been transferred, suggests a paper published in the February issue of *Cell Research*. A related paper also provides evidence that this 'erase and rebuild' process is a critical step that a normal fertilized egg takes on the path to becoming an embryo.

Huizhen Sheng and colleagues report that late in egg development in mice, a broad range of 'factors' essential for regulating gene transcription are dissociated from their normal sites of function on the chromosomes, erasing the maternal program governing gene expression. In addition, the authors show that the cytoplasm of an egg contains most of the components required to reprogram a diploid nucleus containing a complete set of chromosomes, whether it comes from natural reproduction - fertilization of the egg - or is transferred from an adult cell - cloning.

If affirmed by further research, the erase and rebuild model will have a fundamental role in shaping our understanding of the early stages of human development, and will also guide future research efforts aimed at improving the efficiency of cloning.

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