

In vivo MRI of early *Xenopus laevis* embryogenesis

S.-C. Lee, D. Mietchen, C. Kim, T. Yang, C. Lee, and C. Cheong

*Magnetic Resonance Team, Korea Basic Science Institute,
52 Eoun-dong, Yusong-gu, Daejeon 305-333, Korea*

ABSTRACT

Magnetic Resonance Imaging (MRI) is a noninvasive method routinely employed to investigate various aspects of biological structures and processes. Its spatial and temporal resolutions, however, have so far prevented it from application to real-time observations of cellular events.

Here, we present an *in vivo* imaging study of the early embryogenesis of a well-characterized model organism, the South African Clawed Frog *Xenopus laevis* during which image slices with an in plane resolution of 23 μm and slice thickness of 200 μm were acquired in intervals of about 4 min. Cell divisions can be observed in this imaging series, and subcellular compartments like the nucleus are clearly discernable in multiple stages of development.

The results demonstrate the potential of Magnetic Resonance techniques to replace invasive techniques currently used to address questions related to early development or cellular processes in vertebrates.