# Tracing location by applying Emerald luciferase in an early phase of murine endometriotic lesion formation

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## Abstract

The pathogenesis of endometriosis has not been fully elucidated. We focused on the behavior of the ectopic endometrium, that is, the origin of the endometriotic lesion, before adhering to the peritoneal cavity. To observe lesion formation in the very early phase, we developed a novel endometriosis animal model using bioluminescence technology. We established a new transgenic mouse that expressed Emerald luciferase (ELuc) under the control of the CAG promoter. This transgenic mouse, called the CAG-ELuc mouse, showed strong bioluminescence emission; we succeeded in tracing the lesion location by the emission of ELuc. The accuracy of tracing by ELuc was high (57.7-100% of correspondence) and depended on the dosage of E2 administration. In the very early phase after transplantation, the process of lesion formation can be observed non-invasively and chronologically. We have verified that the preferred location of the uterus (transplanted grafts) was fixed immediately after the transplantation of the grafts.

**Keywords:**bioluminescence; endometriosis; in vivo imaging; mouse model; transgenic mouse.