Molecular profiles of basement membranes during early stages of mouse embryogenesis

**Sugiko Futaki**,1,a Itsuko Nakano,1 Ri-ichiroh Manabe,2 Ko Tsutsui,1 Noriko Sanzen,1 Yoshikazu Sado,3 Kiyotoshi Sekiguchi1

1Research Institute for Protein Research, Osaka University, Osaka, 2Genomic Sciences Research Complex (GSC), RIKEN, Yokohama, 3Shigei Medical Research Institute, Okayama, Japan

*Contact author: futaki@protein.osaka-u.ac.jp

**Keywords:** Basement Membrane, Laminin, Mouse Embryo

**Objective:** Basement membrane (BM) plays indispensable roles during embryogenesis. Molecular composition of BMs are critical for the cellular microenvironment which regulates cell behavior and tissue organization. We have investigated the distribution of BM proteins in early mouse embryos and reported overall profiles of the BM protein composition [1]. To obtain further insight into relationships between BM composition and embryonic development, we focused on the BM proteins expressed in developmental stage- and tissue-dependent manners and compared their distributions with tissue specific proteins.

**Methods:** Whole-body sections of early mouse embryos (E5.5 ~ E10.5) were immunostained for various BM or tissue specific proteins.

**Results:** Among 20 BM proteins including individual subunits of laminins and type IV collagens, 11 showed spatiotemporally specific expressions. Laminin α1 and α5 were detected at the earliest stage, i.e. E5.5. The complexity of BM compositions increased as embryonic development advanced. The lung bud of E10.5 embryos showed unique and highly complex BM protein composition. Several characteristic expression patterns of BM proteins were also observed. For example, localizations of laminin α4 were mostly coincident with PECAM-1, a blood vessel endothelial protein. However, in the liver of E10.5 embryos, laminin α4 was hardly detected despite that the distribution of PECAM-1 was similar to several other BM proteins such as laminin α1 and α3, indicating that the blood vessel BM in the developing liver has a unique laminin composition.

**Conclusions:** The comprehensive study of BM composition through developmental stages provides an integral view of the role of BMs and cell-BM interactions in organogenesis.

**REFERENCES**