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Preferential Migration of Transferred Primordial Germ Cells to Left Germinal Ridge of Recipient Embryos in Chickens

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Chicken primordial germ cells (PGCs) circulate in the bloodstream and migrate to germinal ridges. In order to assess the migration frequencies of PGCs to left or right germinal ridges, PGCs were transferred into the bloodstream of recipient embryos and analysed the presence of the donor PGC-derived mitochondrial DNA in the left or right gonad of embryos. First, minimum number of donor PGCs needed to detect donor-derived DNA in the gonads of recipient embryos incubated for 16.5 days were assessed, and found that a single PGC-derived DNA can be detected in the gonads. Then, a single PGC was transferred into the recipient bloodstream and analysed the presence of donor PGC-derived DNA in the left or right gonad of recipient embryos. When male PGCs were transferred into male or female recipient embryos, the donor-derived DNA was detected in the left gonad at the frequency of 61.5% (8/13) or 82.6% (19/23), respectively. On the other hand, when female PGCs were transferred into male or female recipient embryos, the donor-derived DNA was detected in the left gonads at the frequency of 72.2% (27/36) or 91.5% (43/47), respectively. The frequency of male or female PGCs migrating to the left germinal ridge of recipient embryos were 75.0% (27/36) or 83.1% (69/83), respectively, whereas the frequency of male or female recipient embryos attracting PGCs to their left germinal ridge were 69.4% (34/49) or 88.6% (62/70), respectively. These results suggest that female PGCs tended to migrate to the left germinal ridge more frequently than male PGCs,

and female recipient embryos tended to attract PGCs in the left germinal ridge more frequently than male recipient embryos. This preferential migration of PGCs to left germinal ridge would be very important for female PGCs to differentiate normally and give rise to functional gametes efficiently.

Keywords: [chicken](#), [germinal ridge](#), [migration](#), [primordial germ cell](#)

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