**Controlling pluripotency in avian species**

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Pluripotency defines the ability of a cell to self-renew and to differentiate into all of embryonic lineages both *in vitro* and *in vivo*. Pluripotent chicken embryonic stem cells (cESCs) were derived and *in vitro* established from pregastrulating embryos. Those cells exhibit unique properties at the molecular, epigenetic and developmental levels. Obtaining induced pluripotent stem (iPS) cells with similar properties to those of cESCs remains a challenge. We recently showed that the NANOG gene was essential for the long-term establishment of stable clones of reprogrammed cells. The molecular and epigenetic characterizations of these cells indicate that the somatic reprogramming remains partial with the absence of endogenous expression of certain genes of pluripotency. The expression of some exogenous reprogramming genes remains necessary. To improve the cESCs properties and iPS derivation, we are currently developing different tools to label and enrich cell populations according to their pluripotency status.