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**IMPLICATION OF THE *RBPJ*, *NOTCHLESS* AND *STRAWBERRY NOTCH HOMOLOG 2* GENES IN THE CONTROL OF MELANOCYTE STEM CELLS HOMEOSTASIS**

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To better understand the genetic control of melanocyte stem cells (MSCs) maintenance and biology, we chose to work on three coat color mutations: two conditional knock-out mutations, the first invalidating the *RbpJ* gene and the second the *Notchless* gene in the melanocyte lineage (respectively *Tg(Tyr-Cre); RbpJ<sup>fllox/fllox</sup>* and *Tg(Tyr-Cre); Nle<sup>fllox/fllox</sup>* mice, referred to as *cRbpJ* KO and *cNle* KO for conditional *RbpJ* and *Nle* knock-outs); and a mutation leading to overexpression of the *Strawberry Notch homolog 2* gene in the melanocyte lineage (*Tg(Dct-Sbno2)*). We analyzed the corresponding coat color phenotypes at birth and during postnatal life. We show that although all three mutations affect the development of pigment cells, they act on different steps: the *cNle* KO and the *cRbpJ* KO mutations affect melanoblasts survival at an early stage or during late embryogenesis respectively; the *Tg(Dct-Sbno2)* mutation affects melanoblasts migration. As the mutant mice got older, they all displayed coat color whitening. We studied the distribution of pigment cells on skin sections or dissected hair follicles at postnatal day 8 (P8) and P30. We found that in many hair follicles from *cRbpJ* KO and *cNle* KO mice at P30, the MSCs and their progeny were in reduced number. In *Tg(Dct-Sbno2)* mice, many hair follicles at P30 had a reduced number of MSCs that gave no progeny at all. Our results suggest that the *RbpJ* and *Nle* genes control MSCs maintenance in a similar way, whereas *Sbno2* seems to be also involved in the differentiation of MSCs into transit amplifying melanoblasts.

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**STUDYING SEXUAL DEVELOPMENT USING MUTAGENESIS IN THE MOUSE**

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In mammals the gonadal sex of an individual is determined by the presence or absence of the Y chromosome and the subsequent activity of SRY during early male gonad development. In addition to SRY, a number of autosomal and X-linked gene products are also required for development of testes and ovaries in males and females, respectively. A number of lines of evidence suggest that our understanding of the sex determining pathway is far from complete. We have performed a forward genetic screen for loci controlling embryonic development in the mouse. ENU mutagenesis and a three generation (G3) breeding scheme have allowed the identification of recessive mutant alleles affecting a variety of developmental processes. One mutant pedigree identified included embryos exhibiting neural tube defects and abnormal male gonad development, with phenotypes ranging from disrupted testis cord formation to the presence of ovarian gonad morphology in XY individuals. We will describe the chromosomal mapping and molecular characterisation of the mutated locus and describe more detailed phenotypic characterisation of the mutant gonads on distinct genetic backgrounds.