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Jean-Jacques Panthier

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## PHENOTYPIC INSTABILITY OF PATCHWORK MUTATION: AN EPIGENETIC EFFECT ?

Geneviève Aubin-Houzelstein (1), Pierrick Salaün (1), Laurent Guillaud (1), and Jean-Jacques Panthier (1, 2)

1. Cellular and Molecular Genetics UMR 955 INRA-ENVA, Ecole Nationale Vétérinaire d'Alfort, 7 avenue du Général-de-Gaulle, 94704 Maisons-Alfort cedex, France.
2. Mouse functional Genetics Unit, Institut Pasteur, 25 rue du Docteur Roux, 75724 Paris cedex 15, France.

PRM/Alf mice are homozygous for patchwork (*pwk*), a mutation conferring a salt-and-pepper coat color phenotype. In their coat, black hairs are intermingled with white hairs, without any gray hairs <sup>1</sup>. patchwork is also characterized by its phenotypic instability, two thirds of *pwk/pwk* mice carrying one or more patches of wild-type color on their coat, referred to as reversion patches. No reversion event can be transmitted via the germline.

Microarrays experiments showed a number of genes from the patchwork region that were differentially expressed in the skin of patchwork fetuses compared to controls. Among them, *Mbd3*, encoding Methyl Binding Protein 3, was found overexpressed in patchwork skin. MBD3 is part of a CpG-methylated DNA binding complex and is involved in chromatin remodeling. Moreover, we performed fluorescent in situ hybridations on PRM/Alf *pwk/pwk* and C57BL/6N embryonic fibroblasts with three adjacent probes from the patchwork region. We found that chromatin seemed to be more condensed in the patchwork region of PRM/Alf fibroblasts compared to C57BL/6N controls.

We hypothesized that *patchwork* DNA methylation status may be involved in patchwork coat color phenotype and reversion rate. To test this hypothesis, we use the same protocol as Waterland *et al.*, who reported that a diet supplemented with methyl precursors can enhance the CpG methylation status of the *A<sup>y</sup>* locus <sup>2</sup>. We have produced 90 and 107 PRM/Alf mice fed with a methyl precursors supplemented diet and a control diet respectively. We are analyzing the number and size of reversion patches in both populations.

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2. Waterland RA, Jirtle RL (2003). Transposable elements : targets for early nutritional effects on epigenetic gene regulation.