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Scientific session:

Nuclear Compartments and Gene Expression

Title:

Mouse PML protein isoforms and their role in Mouse Polyomavirus infection

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Abstract text:

Promyelocytic leukaemia nuclear bodies (PML NBs) are dynamic, spherical, membrane-less structures composed of the main scaffold PML protein and a variety of stable or transient partner proteins. Apart from many endogenous functions, PML NBs play an important role in antiviral defence, both as direct restriction factors and regulators of the interferon responses. Hence, many viruses developed effective mechanisms to counteract this restriction. This project uses Mouse polyomavirus (MPyV) as a model for studying interactions of PML and viral components. The mouse PML (mPML) protein occurs in three confirmed (mPML1-3) and six predicted (mPMLX1-X6) isoforms. Individual isoforms may affect the composition and functions of PML NBs and mediate antiviral effects.

Our data showed, that during MPyV infection, mPML NBs appeared in close proximity to viral replication centres. In *Pml* KO cells, the transcription of MPyV regulatory genes was significantly increased and the amount of viral progeny was approximately two times higher. These results indicate a potential restriction function of mPML NBs and/or mPML protein in MPyV infection. Therefore, we focused on the role of individual mPML isoforms. Their expression has been examined in different mouse tissues. The expression of all, confirmed and predicted isoforms was proved and, in addition, a novel isoform (named by us mPMLXK) was detected in all tested samples. Subsequently, the analysis of PML NBs formation and restriction functions was initiated. The longest mPML2 isoform formed speckles when expressed in *Pml* KO cells and in WT cells, it incorporated into endogenous mPML NBs. However, its overexpression did not significantly affect MPyV infection neither in *Pml* KO nor in WT cells. The proposed antiviral role of other mPML isoforms is now under investigation.

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