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## RILES, a novel engineered genetic-switch expression system for the temporal analysis of microRNA expression in small animal model

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The underestimation of the temporal and spatial resolution of microRNA (miRNA) expression results in the loss of important information connecting miRNA expression and cell function. However, monitoring the expression of miRNA under (physio) pathological conditions is challenging because of the tiny size and the dynamic aspect of miRNA expression and the absence of relevant monitoring probes for longitudinal study. Recently, we engineered a genetic switch expression system to monitor the activity of the endogenous RNAi machinery. The system called RILES, for RNAi-Inducible Luciferase Expression System, which was customized in such a way that it is the miRNA of interest that switch-on the expression of the luciferase gene. Hence, the functionality of miRNA expression in cells is signed by the emission of bioluminescence signals that can be easily monitored using standard bioluminescence equipment. We brought a complete proof of principle study by monitoring the expression of muscular atrophy in mice. Bioluminescence experiments generated robust data that correlated well with the miRNA expression pattern detected by QRT-PCR. We demonstrated that RILES also offers a temporal dimension analysis of miRNA expression that has never been reached before, which allows to collect relevant information about miRNA function that conventional monitoring methods could not do. As RILES is simple and versatile, we believe that this methodology will contribute to a better understanding of miRNA biology and could serve as a rationale for the development of novel miRNA therapeutics.

## Biography

Patrick Baril received his PhD in the year 2003 and was awarded with the Talented Young Research Investigator Award at European meeting in Cancer in the same year. After that, he joined the Cancer Research UK Institute in London to study the molecular basis of pancreatic cancer development. In the meantime, he was fascinated by the potential of molecular imaging modalities to monitor the expression of genes in physio-pathological conditions and found a novel method to monitor the spatiotemporal expression patterns of miRNAs. He was recently appointed as Lecturer in CBM lab where he conducts his own research in the field of miRNA biology and its therapy.

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