

## Transposon-host interaction using *Sleeping Beauty* transposon as a model system

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*Sleeping Beauty* (SB) is a DNA transposon, a member of the Tc1/mariner-superfamily of transposable elements. It contains a single open reading frame encoding the SB transposase flanked by the Inverted Terminal Repeats (IRs), which are the recognition sites for the SB protein that catalyzes the transposition reaction via a “cut & paste” mechanism. Previous work has shown that the transcription of SB transposase is driven by its own promoter in its 5' untranslated region (5' UTR) region. Furthermore, an evolutionarily conserved host protein, HMG2L1, has been shown to up-regulate the transcriptional activity from the 5' UTR of SB transposase by a protein-DNA interaction. We used the SB transposon system as a tool to study the transcriptional control of transposase expression in vertebrates. We have shown that SB transposon gets differentially regulated in germ cells and somatic cells, since we know that the insertions in germ cells are more likely to be passed to the next generation and therefore, transposons have a better chance to self-perpetuate. Hence, further experiments were focused on studying the differential expression of the host factor, HMG2L1, and as envisaged, the results showed that the expression of HMG2L1 is highly upregulated in germ cells compared to somatic cells. To summarize, we have presented an experimental proof for the direct involvement of host factor HMG2L1 in regulating the expression of the SB transposase, and that the cell specific expression of HMG2L1 controls the spatiotemporal expression of SB transposon.

### Biography

Anantharam Devaraj is a molecular stem cell biologist with over a decade of experience. Anantharam worked on models from fly to mouse in reputed institutes and universities and made contributions by publishing more than 10 international papers in the area of stem cell and gene therapy. Very well-versed with use of transposons for genome editing. Anantharam did his PhD with DAAD fellowship in molecular genetics from Max-Delbrück Center under the supervision of Dr. Zsuzsanna Izsvak. After his PhD, Anantharam took up post-doctoral research position at Centre for Neural Circuits and Behavior, University of Oxford. At present, Anantharam is working as an Assistant Professor at King Khalid University, Abha, Saudi Arabia from December 2017. With his immense experience in understanding the key concepts of basic research and applied sciences, Anantharam is working in stem cell department to make the way for mesenchymal stem cells from bench to bed.

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