

## Isolation and Characterization of Putative Liver-specific Enhancers in Proboscis Monkey (*Nasalis larvatus*)

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### ABSTRACT

Enhancers are indispensable DNA elements responsible for elevation of gene transcriptional efficiency that regulates biological processes tightly at various developmental stages, linking them to numerous genetic diseases. Discovering the enhancer landscape of the genome will not only benefit mankind, but also aid in conservation researches involving endangered non-human primates such as the proboscis monkey. As one of the most ancient colobine endemic to Borneo Island, the proboscis monkey offers a wide spectrum of unique and exclusive characteristics that distinguish it from other primates. This study has successfully isolated 13 liver-specific enhancers from this primate and tested for their activities in HepG2 and A549 cell line. The TFBS-enriched regions such as pairs of AP-1, clusters of C/EBP- $\beta$  and triplets of HNF-1 in enhancers contributed to enhancer activities whereas huge clusters of HNF-3 $\beta$  possess suppressing effects, but generally these regions contributed to the cell specificities of enhancers. It is hoped that this study serves as a stepping stone in knowledge enrichment on this primate and future conservation researches.

*Keywords:* Computational approach, conservation, enhancer, liver, proboscis monkey

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### INTRODUCTION

Enhancers are DNA elements capable of elevating transcriptional efficiency of the genes they regulate regardless of their orientation and locality in the genome (Khoury & Gruss, 1983; Lim et al., 2018a). There are many roles that require the involvements of the enhancers for the determination of phenotypes especially