

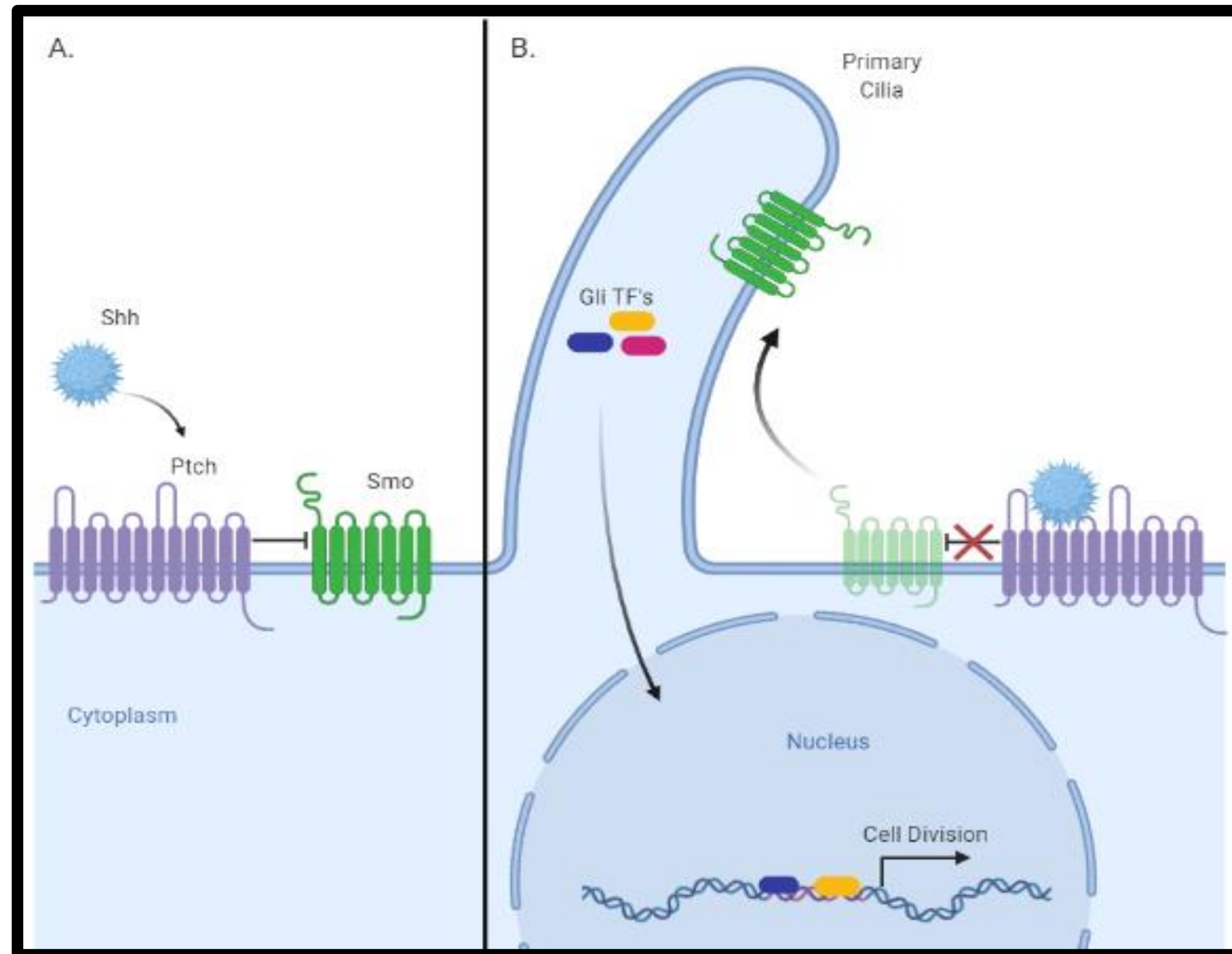
The Post-transcriptional Regulator Musashi Binds Sonic Hedgehog mRNA in the Developing Mouse Palate

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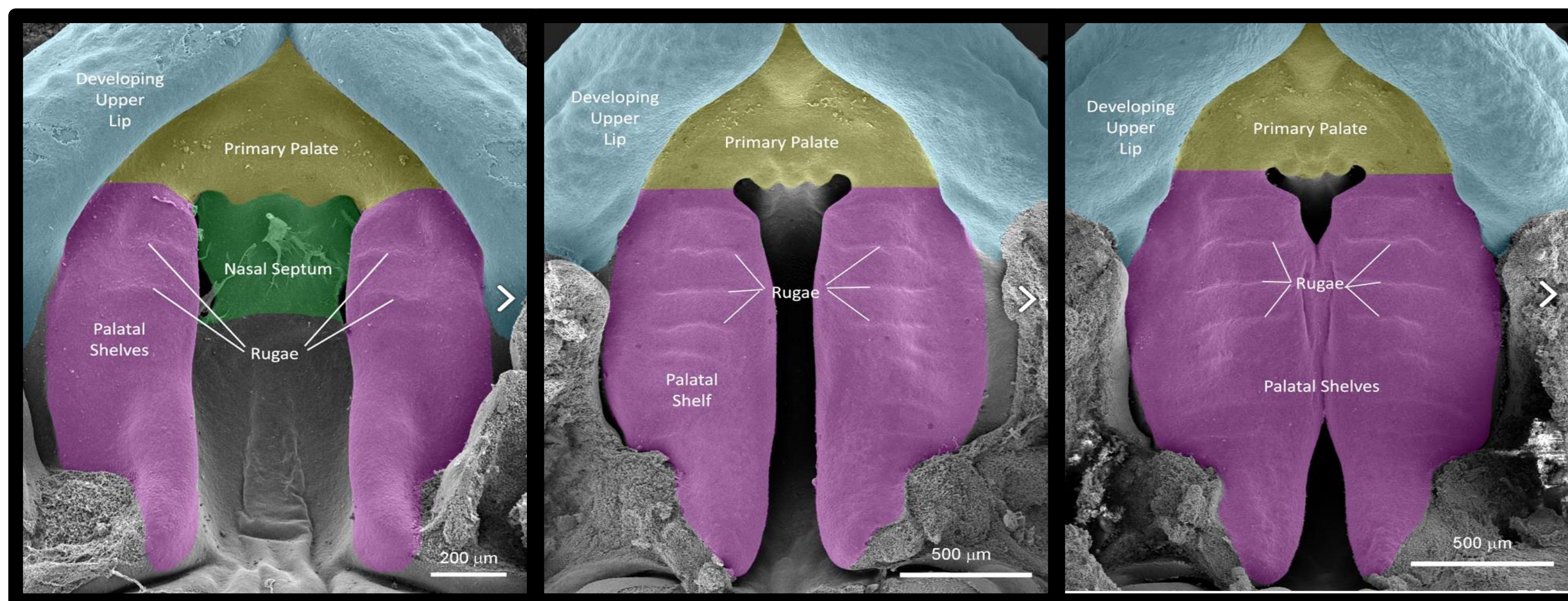
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Introduction

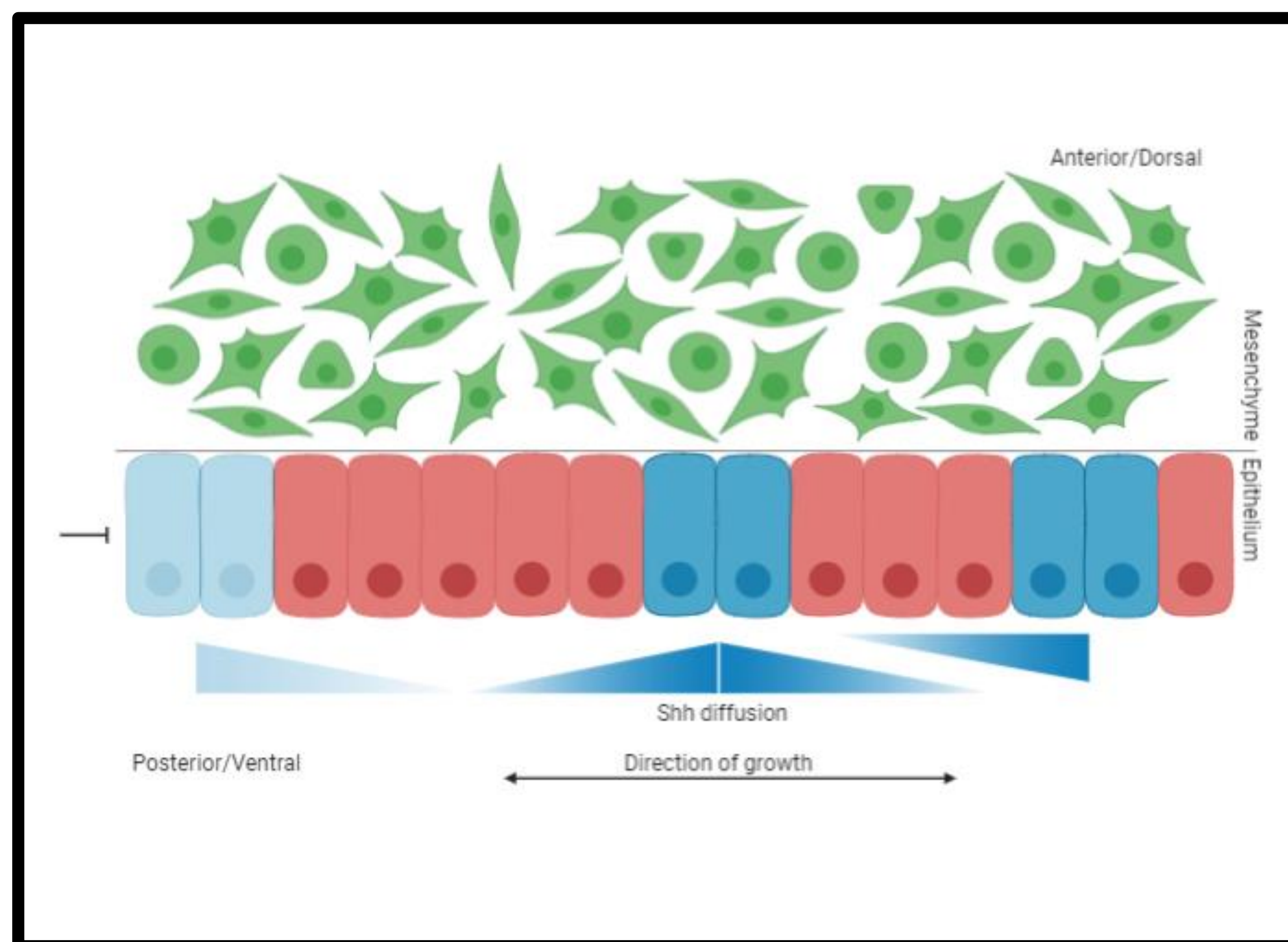
- The Shh pathway is essential for embryonic patterning during early stages of development.
- Shh is a powerful mitogen that must be tightly regulated due to its mutagenic potential.
- Its production must be limited to growth zones.



- Shh* is only expressed in the rugae of palatal shelves

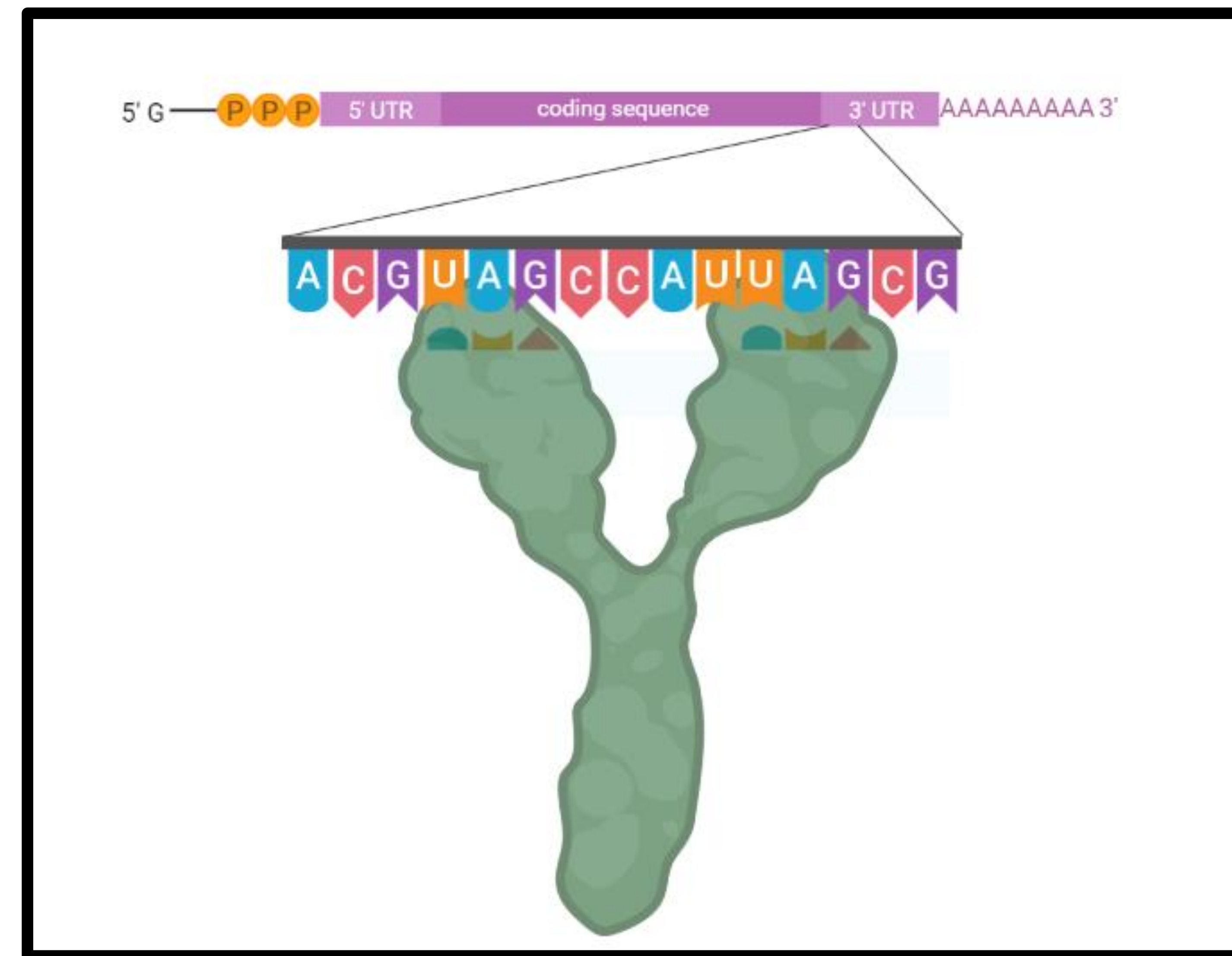


- SHH proteins diffuse from the rugae, resulting in anterior/posterior oriented tissue growth.

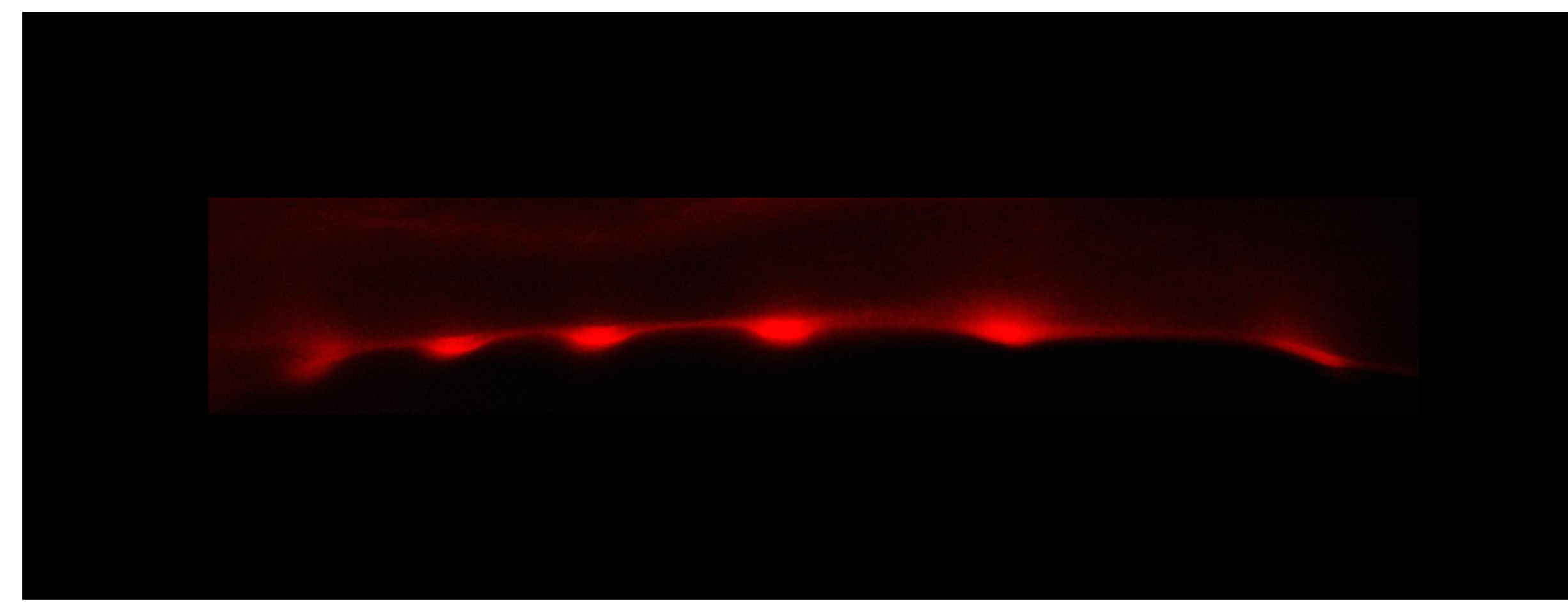


- Mammalian rostral length strongly correlates with number of palatal rugae.

- Shh mRNA contains three musashi binding elements within its 3'UTR.



- MSI production occurs only in palatal rugae, where *Shh* mRNA is produced.

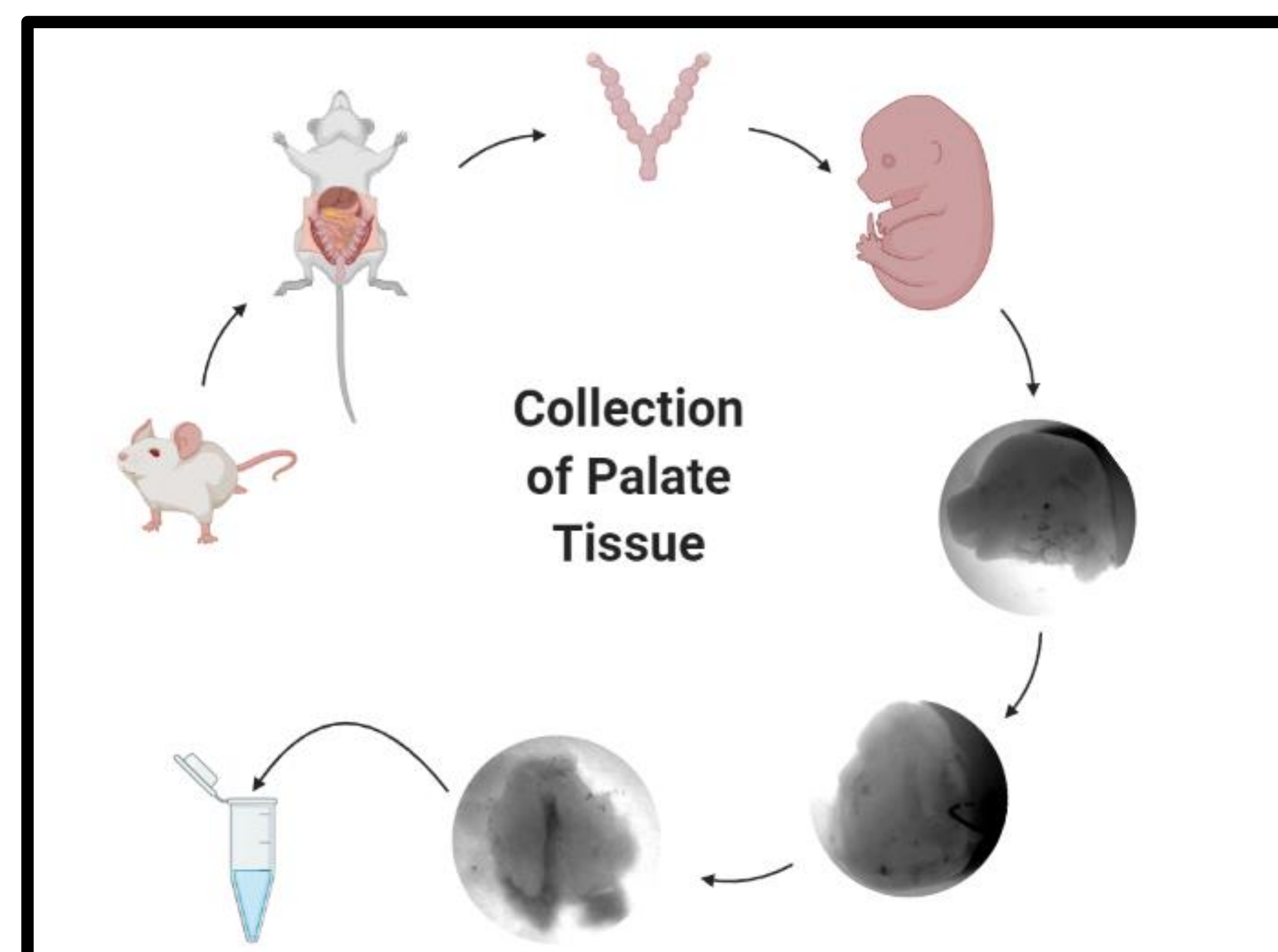


Hypothesis

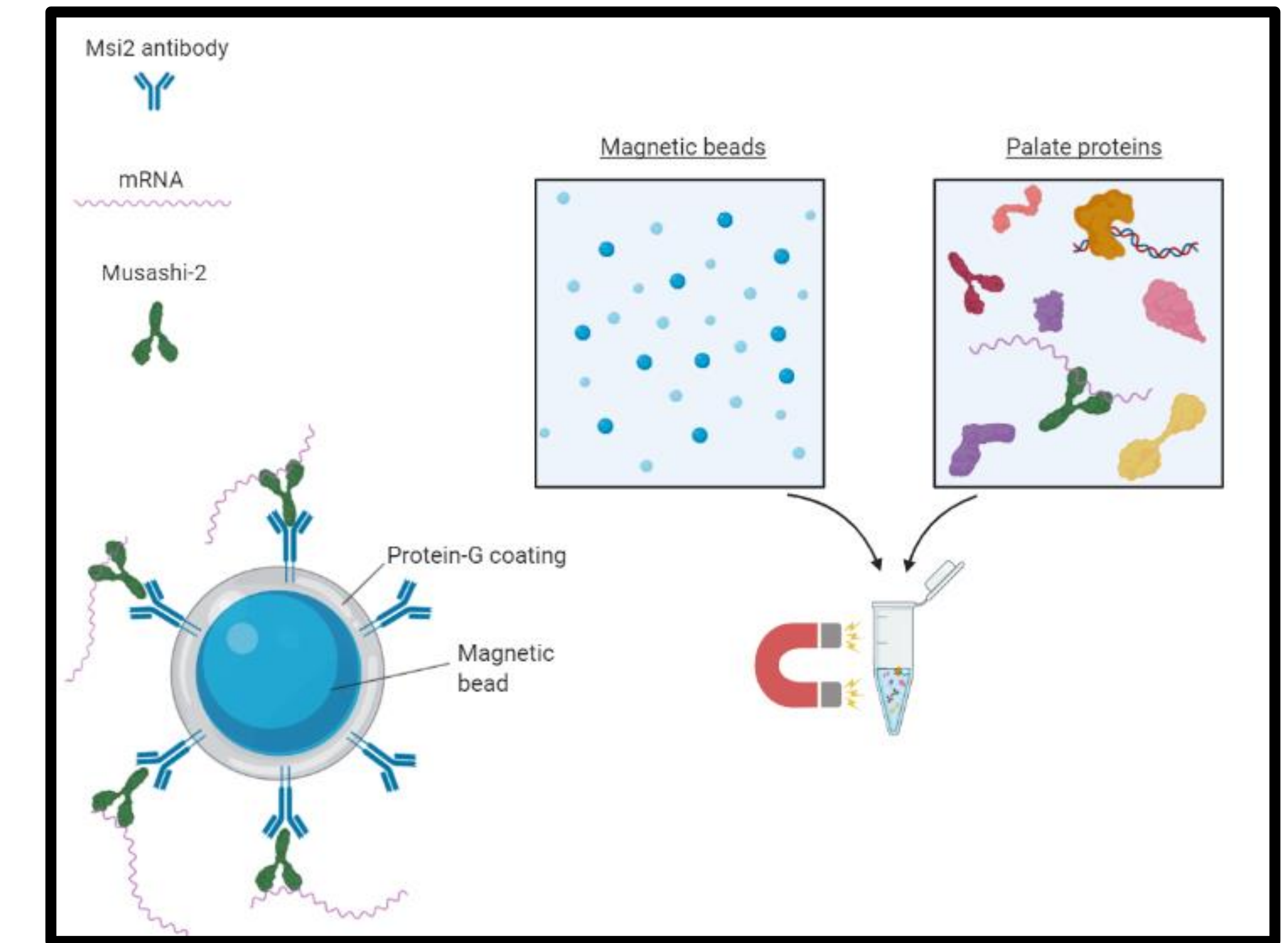
The RNA-binding protein, musashi, post-transcriptionally regulates *Shh* mRNA in the developing mouse palate.

Methods

- Palatal tissue was collected from E14.5 mouse embryos

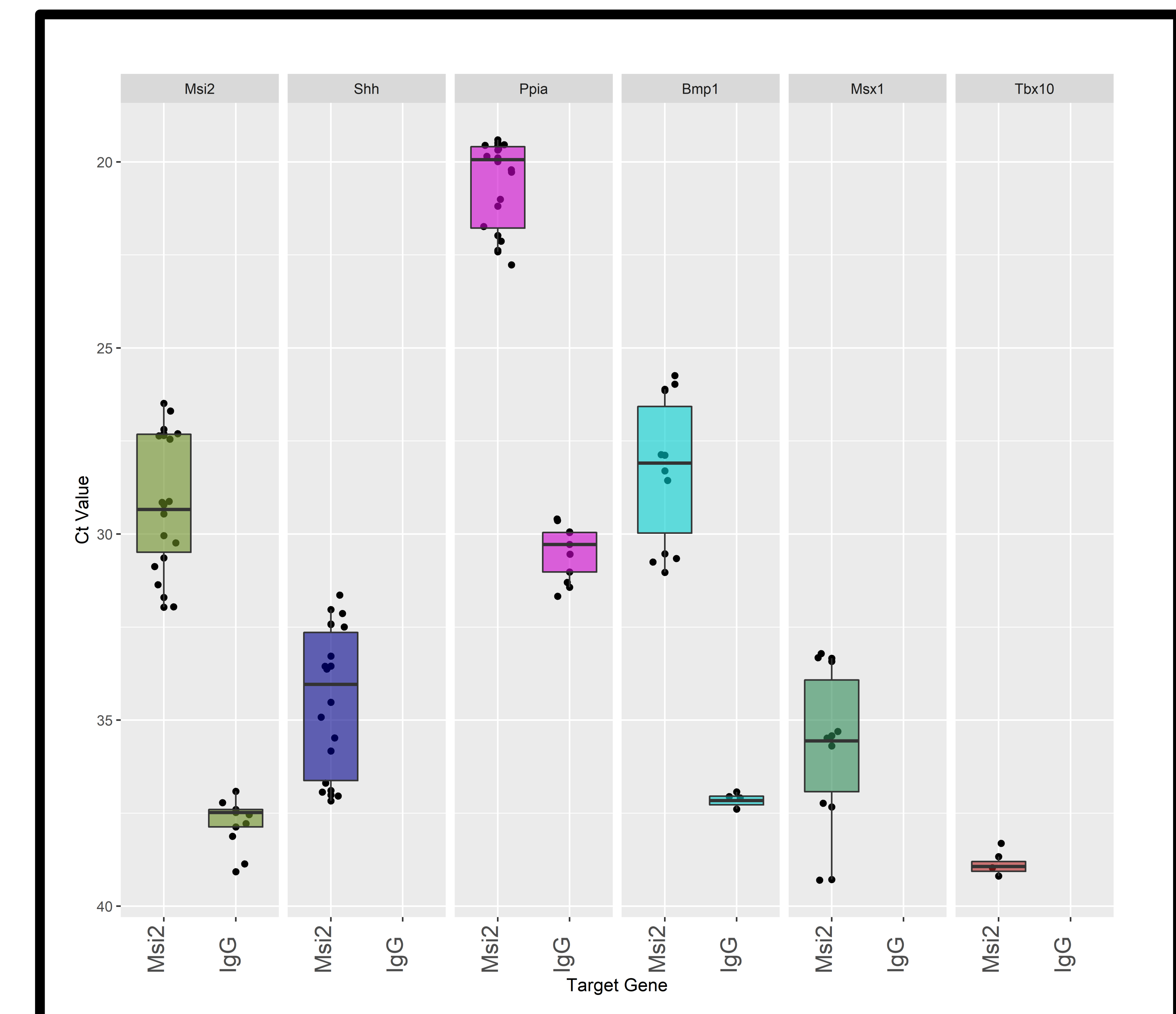


- RNA-immunoprecipitation with MSI antibodies and Dynabeads was performed.



Results

- RIP-qPCR confirmed that MSI binds transcripts containing MBEs in the growing palate.



Future Work

- Gene expression assays involving site-directed-mutagenesis.
- Analysis of degree and directionality change of translation induced by MSI-binding.
- NGS sequencing of RIP products.
- Assembly of MSI-bound mouse palate transcriptome
- Construct a gene interaction network of MSI-regulated transcripts.