

Introduction

The **WNT5A protein** is said to be involved in processes that are responsible for the **growth, elongation, and patterning of cells** during embryonic development. Mice missing the *Wnt5a* gene, have been observed to have less bone growth, leading to a smaller body and irregular limb development.

Aim

My project involved **tracking the expression** of the WNT5A protein, to find out where exactly the protein functions, in **human embryonic tissue**. Since the **gut tube** undergoes a substantial amount of elongation before birth, I decided to focus on that, in a **CS20 (50 dpc)** human embryo.



Fig 2. 'Painting' domains in MAPaint



Fig 3. Representation of painted areas in Amira

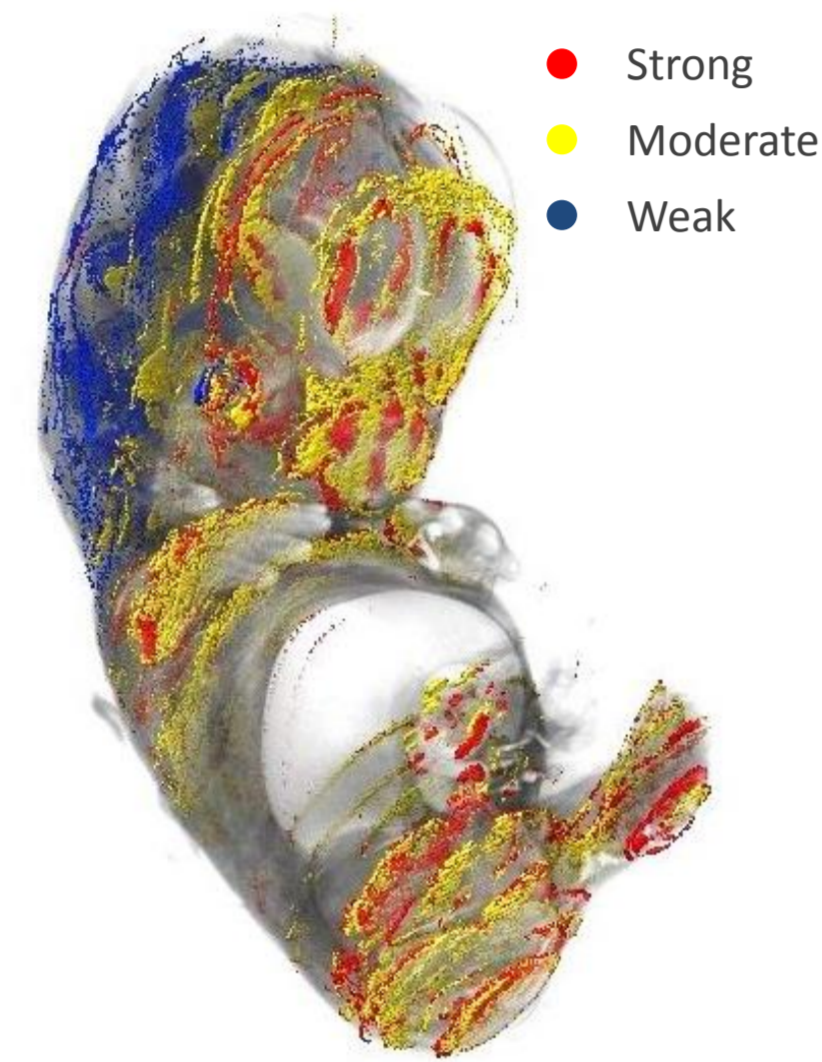
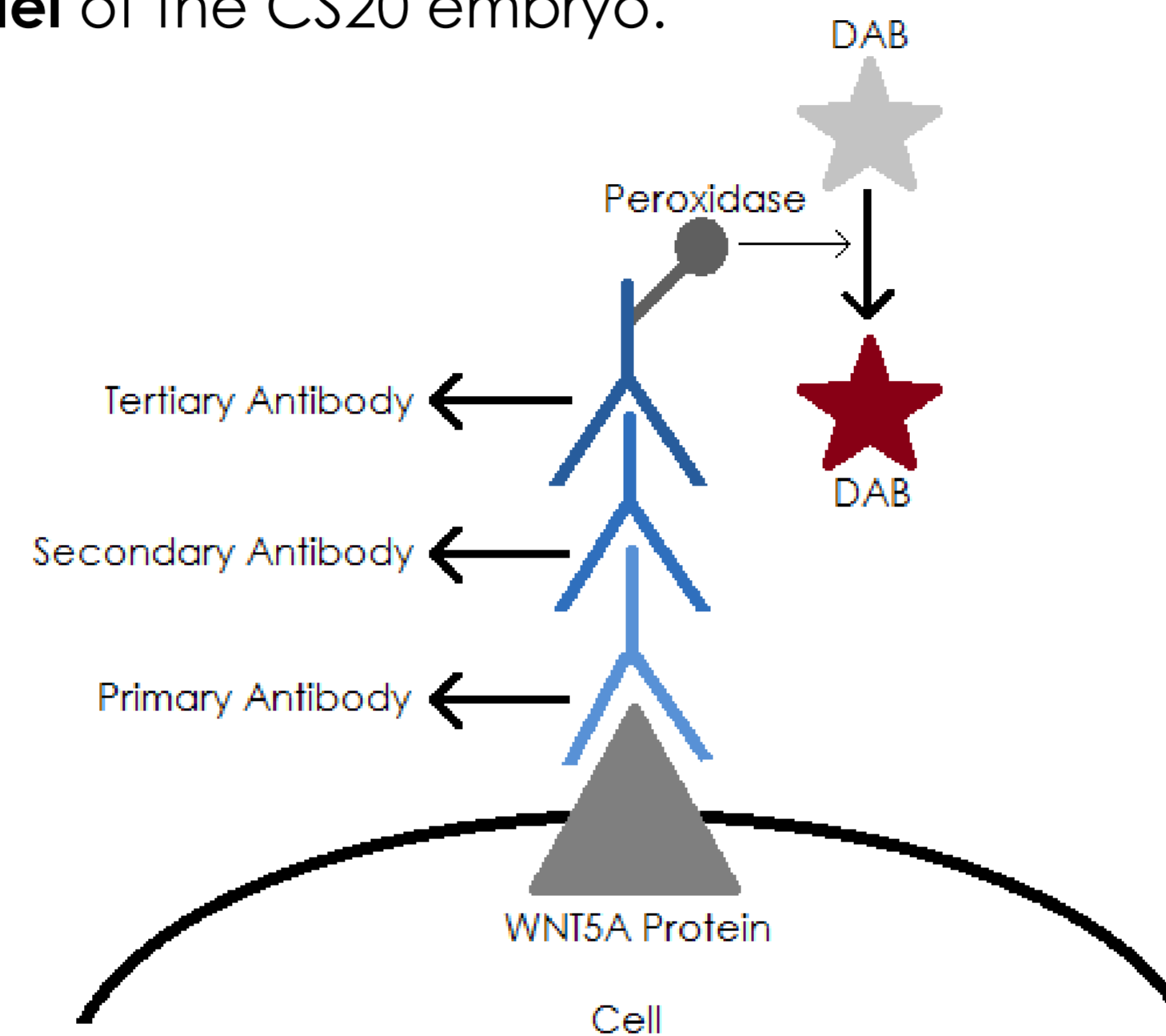


Fig 1. WNT5A Expression Pattern in a CS20 Embryo

Method

Using **Immunohistochemistry**, presence of the protein was observed, and **highlighted** in the MAPaint and Amira softwares, to pinpoint the areas of expression, in a **3D model** of the CS20 embryo.



Conclusions

Expression of the WNT5A protein was observed in a specific layer – **the epithelium** – present just outside the lumen, throughout the entire gut tube. This layer, most probably, develops into **the mucosal layer in adults**.

Intensity of protein expression was constant throughout this layer.

Expression was also noted in **other organs**, especially the heart and liver.



Fig 4. WNT5A Expression in the Stomach (Foregut)



Fig 5. WNT5A Expression in the Intestinal Loops (Midgut)



Fig 6. WNT5A Expression in the Anus (Hindgut)



Fig 7. WNT5A Expression in a Transversely Sectioned CS20 Embryo

Discussion

- Stages **preceding CS20** could be observed to detect the presence of the WNT5A protein, which might signify the **onset of growth and elongation** in the gut tube.
- Stages **proceeding CS20** could be measured for expression, in case the protein levels fall, which might indicate when growth reaches a standstill. This might signify the **approximate extent of growth required before birth**.
- **In situ hybridization** could be performed to find out the **location of the mRNA**. This could give a **spatio-temporal profile** (varying expression with place and time) of the expression of the *Wnt5a* gene.