

# SPATIO-TEMPORAL LOCALIZATION OF BETA TUBULIN III IN THE ORGAN OF CORTI AND IN THE SPIRAL GANGLIA BETWEEN THE EMBRYONIC DAY (E18) AND THE POST-NATAL DAY (P25) IN RAT.

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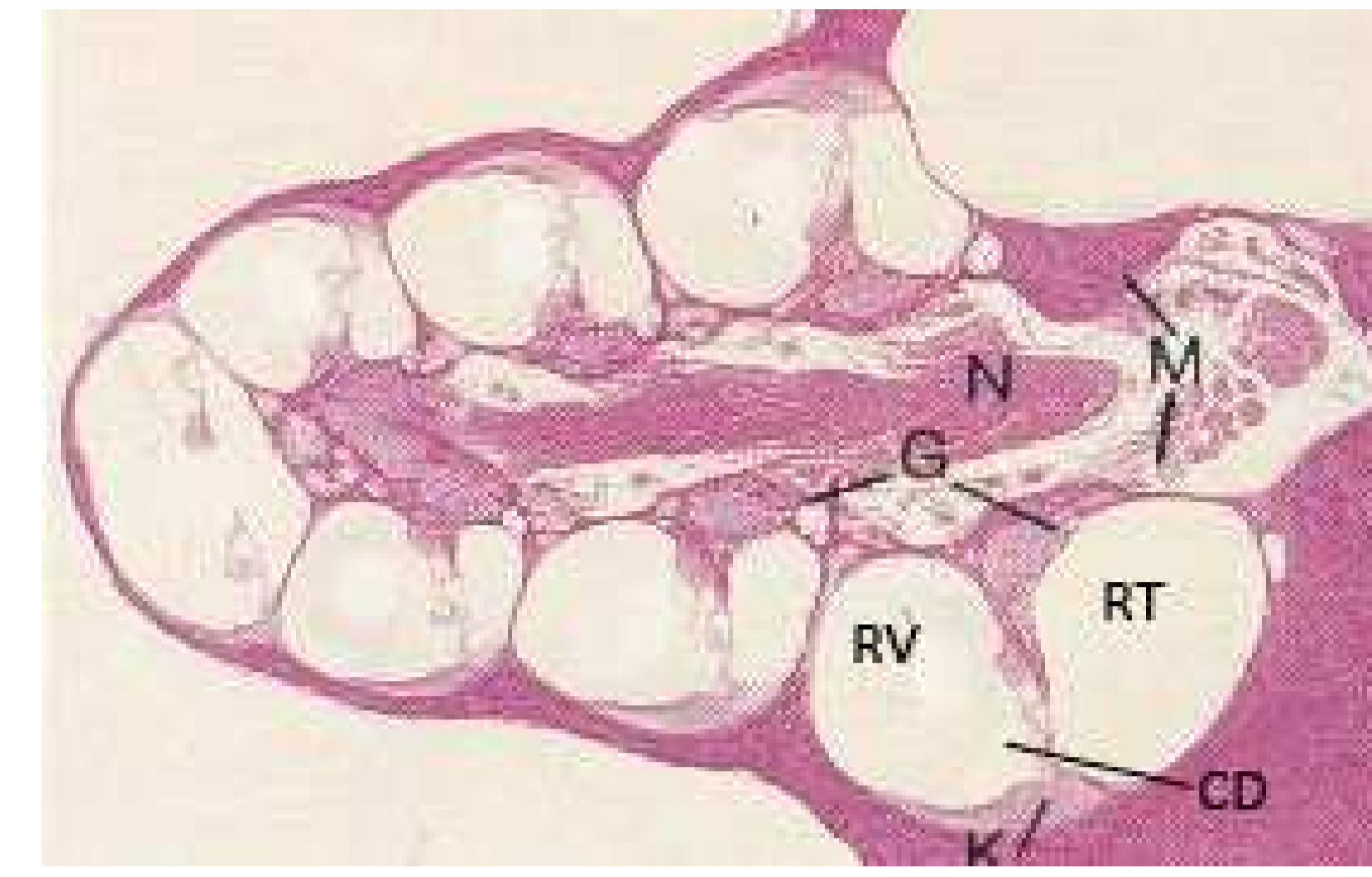


## Introduction

The mammalian auditory organ, the organ of Corti (OC), is composed of mechanosensory hair cells and nonsensory supporting cells types. Based on their morphology and physiology, at least two types of sensory cells can be identified in the OC: inner and outer hair cells.

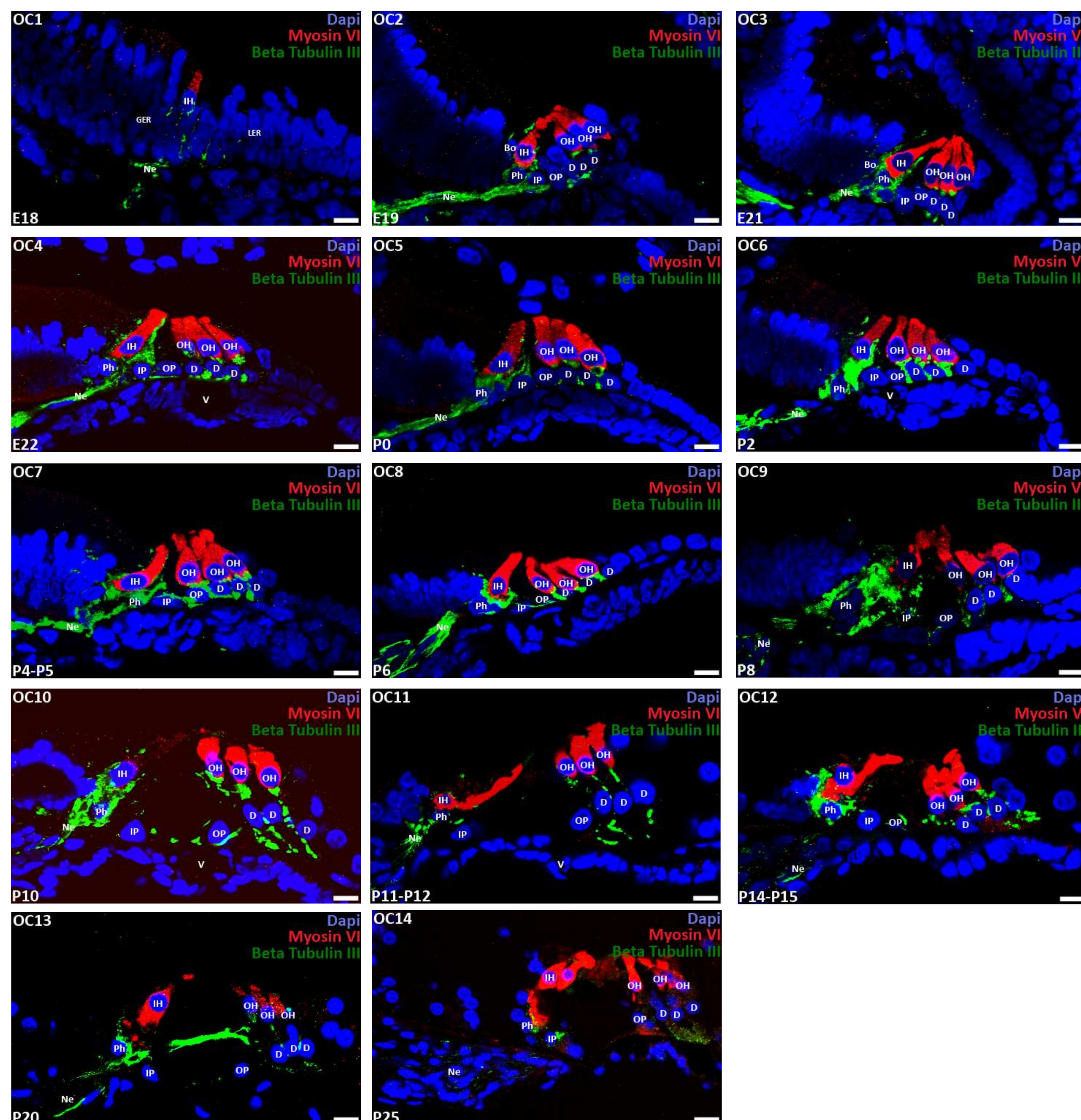
The organ of Corti is innervated by the spiral ganglia. It is composed by glial cells and by two types of neurons: type-1, innervating inner hair cells, and type-2, innervating outer hair cells.

Although the structure of the auditory organ in mature mammals is clearly established, its development is far to be elucidated. Using antibodies against beta tubulin III, typical for neural cells, we investigated by confocal microscopy the setting up of the extension innervating the hair cells and the spiral ganglia during the differentiation of the OC and the cochlea in rat from the embryonic day 18 (E18) to postnatal day 25 (P25).



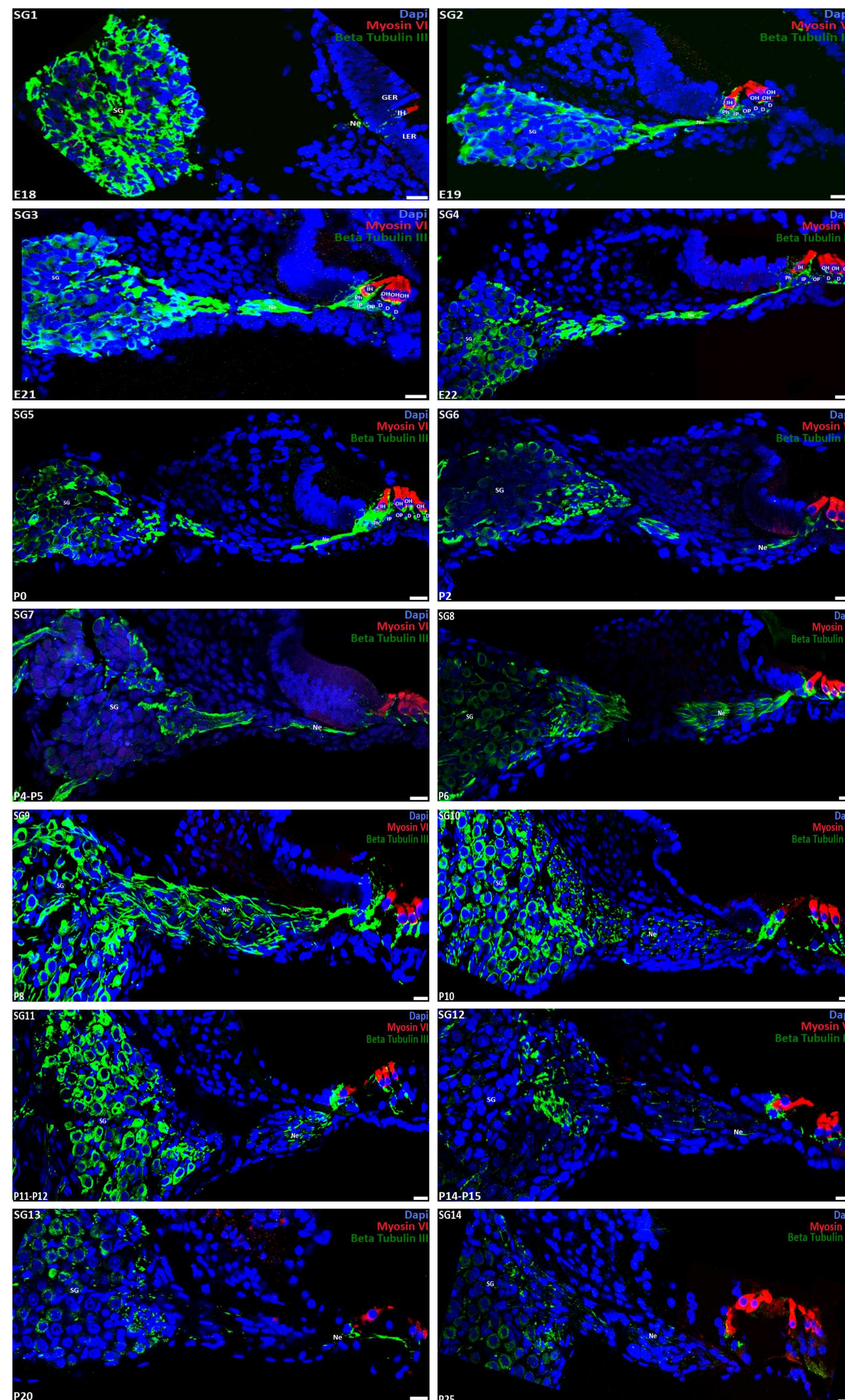
## Results

### Organ of Corti



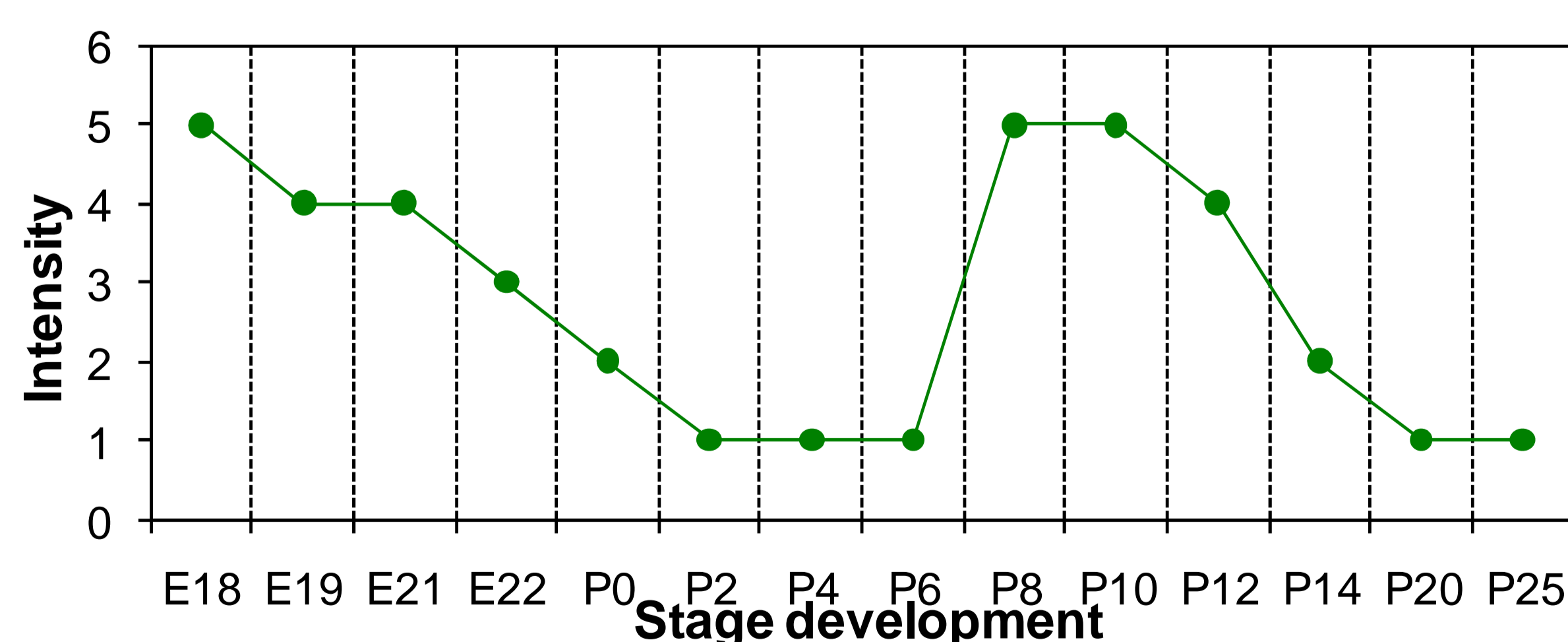
Figures OC1-OC14: Spatiotemporal distribution of beta tubulin III during the mammalian auditory organ development from E18 to P25 in the basal part of the cochlea. At E18, small beta tubulin III could only be detected in the extensions innervating the inner hair cell. At E19, the beta tubulin III is localized in the extensions innervating the inner hair cell and the two first rows of the outer hair cells. From E21 to P25, this protein is present in the extensions innervating the inner hair cell and the three rows of the outer hair cells. Bo : Border cell; D: Deiters' cells; IH: Inner hair cell; IP: Inner Pillar cell ; Ne: Neurons ; OH: Outer hair cell; OP: Outer Pillar cell. Bar: 10µm. Red: Myosin VI; Green: Tubulin beta IV; Blue: Dapi.

### Spiral ganglia



Figures SG1-SG14: Spatiotemporal distribution and intensity of beta tubulin III immuno-labeling during the mammalian spiral ganglia development from E18 to P25 in the basal part of the cochlea (Graph1). Bo : Border cell; D: Deiters' cells; IH: Inner hair cell; IP: Inner Pillar cell ; Ne: Neurons ; OH: Outer hair cell; OP: Outer Pillar cell. Bar: 10µm. Red: Myosin VI; Green: Tubulin beta IV; Blue: Dapi.

### Beta tubulin III labelling



Graph1: Evolution of the beta tubulin III intensity in the spiral ganglia between E18 and P25.

## Conclusions

These results reveal that beta tubulin III appears before birth in the nervous extensions connecting the sensory cells of the OC according to a modiolar-to-striolar gradient. In the spiral ganglia, the labelling progressively decreases during its development.