

# Evidence of the p75 pan-neurotrophic receptor in platelets and comparison to the isoform found in brain

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## INTRODUCTION

### Platelets

- Crucial to thrombosis & haemostasis
- Share similarities with neurons

### Brain-derived neurotrophic factor (BDNF)

- Involved in learning and memory through the tropomyosin receptor kinase B (TrkB) and the **p75 pan-neurotrophic receptor (p75<sup>NTR</sup>)**
- 100-1000x more abundant in platelets
- Blood and brain levels dysregulated in many neurological diseases

### p75<sup>NTR</sup> receptor

- Two isoforms (full-length and truncated)
- Many types of post-translational modifications

## RESEARCH QUESTIONS

- Do platelets express p75<sup>NTR</sup>?
- Does this receptor bear similarities to the receptor found in the brain?
- Could platelets be used as peripheral biomarkers of neuronal health?

## METHODS

### Western Blotting

- Denaturing and reducing conditions
- Antibodies raised against the intracellular and extracellular domains

### Enzymatic Deglycosylation

- Removal of all N-glycans with PNGase F
- Removal of simple O-linked glycans with protein deglycosylation mix II from New England Biolabs

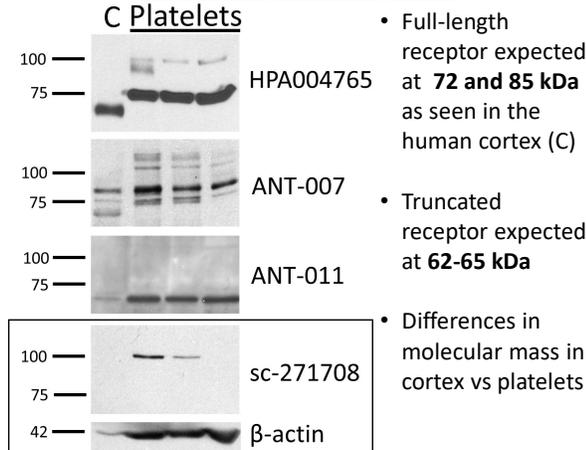
### Flow Cytometry & Confocal Microscopy

- Fixation in 1% paraformaldehyde
- Permeabilization with 0.1% Triton X-100

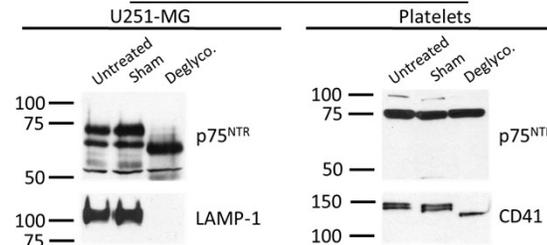
## RESULTS

### A band consistent with p75<sup>NTR</sup> is seen

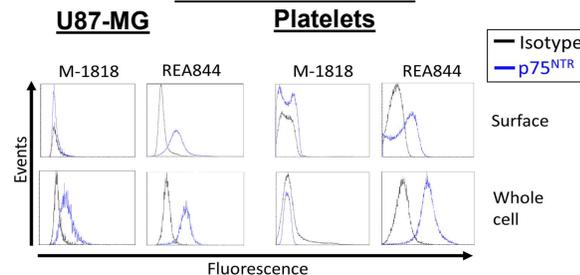
#### in human platelet lysates



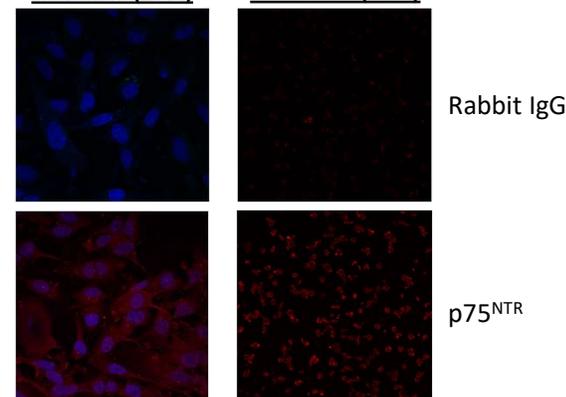
### Differences in mass suggests different post-translational modifications



### p75<sup>NTR</sup> is expressed at the platelet membrane and inside the cells



### U87-MG (20X)      Platelets (63X)



## DISCUSSION

- Antibody-based methods suggest p75<sup>NTR</sup> may be present, but give divergent results
- A more robust method of protein identification (e.g. mass spectroscopy) is required to confirm protein identity

## CONCLUSIONS

- Platelets appear to express the full-length p75<sup>NTR</sup> isoform
- Antibodies should be carefully characterized to study this receptor outside of the central nervous system
- Platelets as peripheral biomarkers of neuronal health: not ready for prime time

## FUTURE WORK

- Investigate the function and signaling of p75<sup>NTR</sup> in human platelets
- Determine the potential role of this receptor in platelet biology

## ACKNOWLEDGMENTS

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Québec



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