

Endocytic receptors in health & disease

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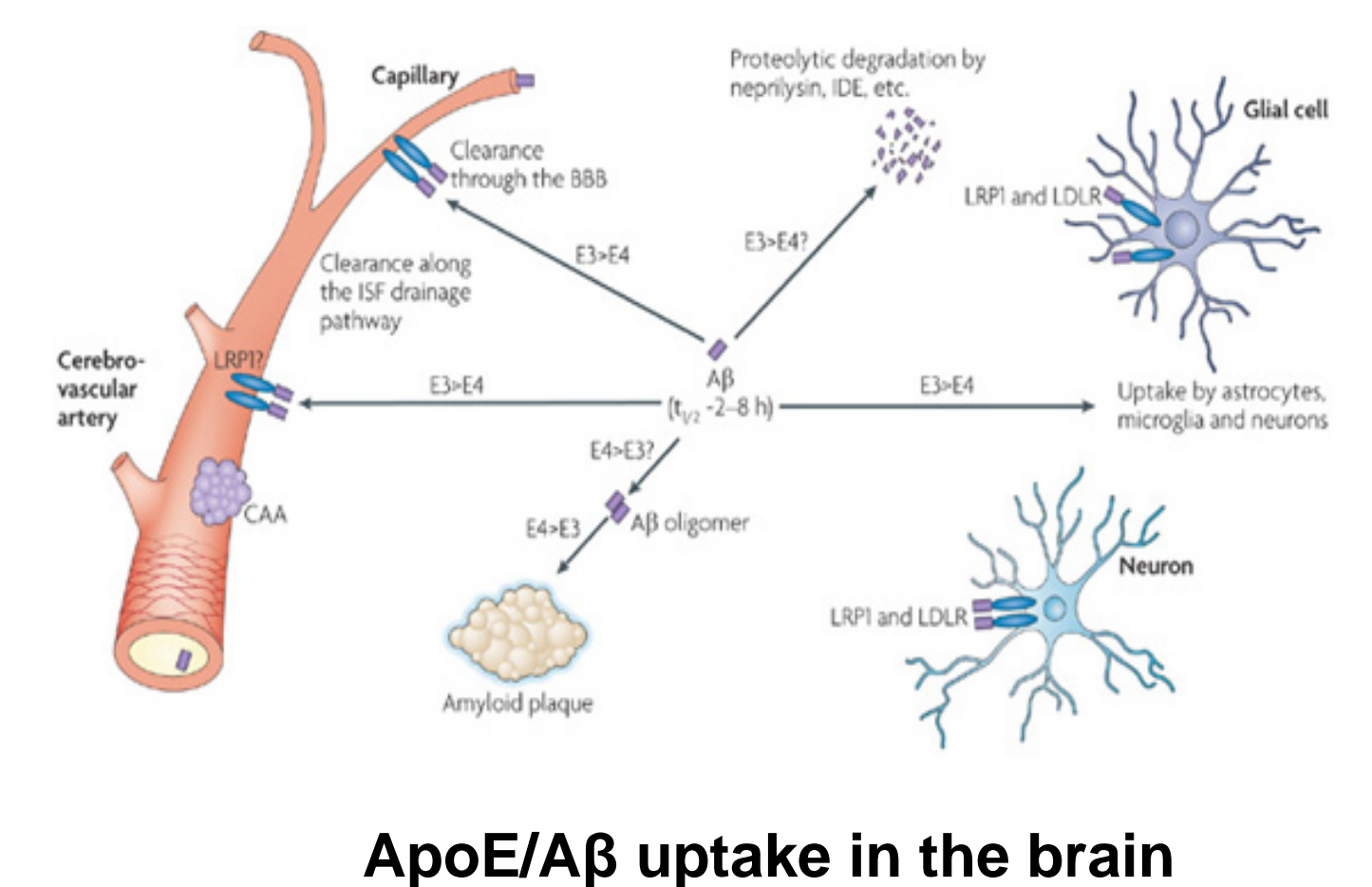
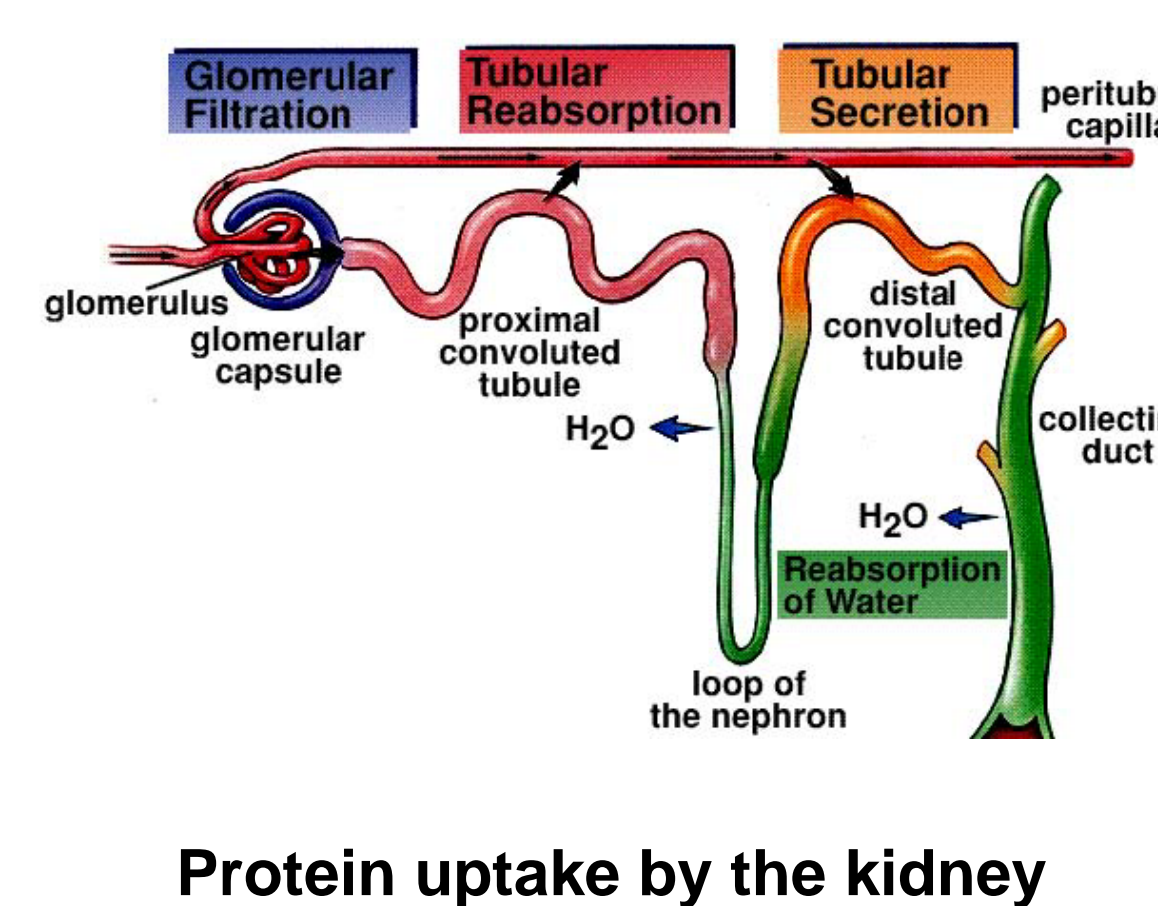
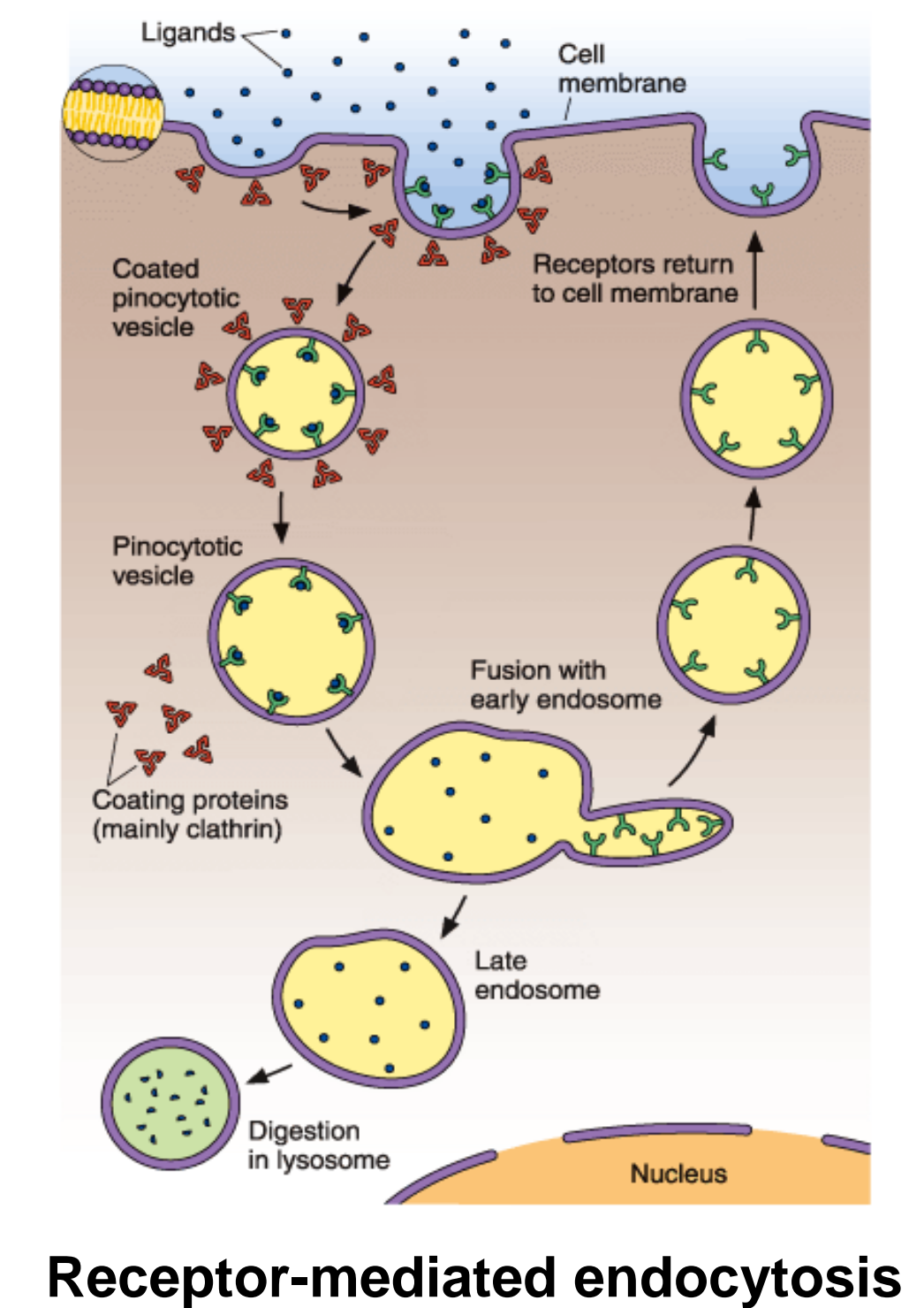
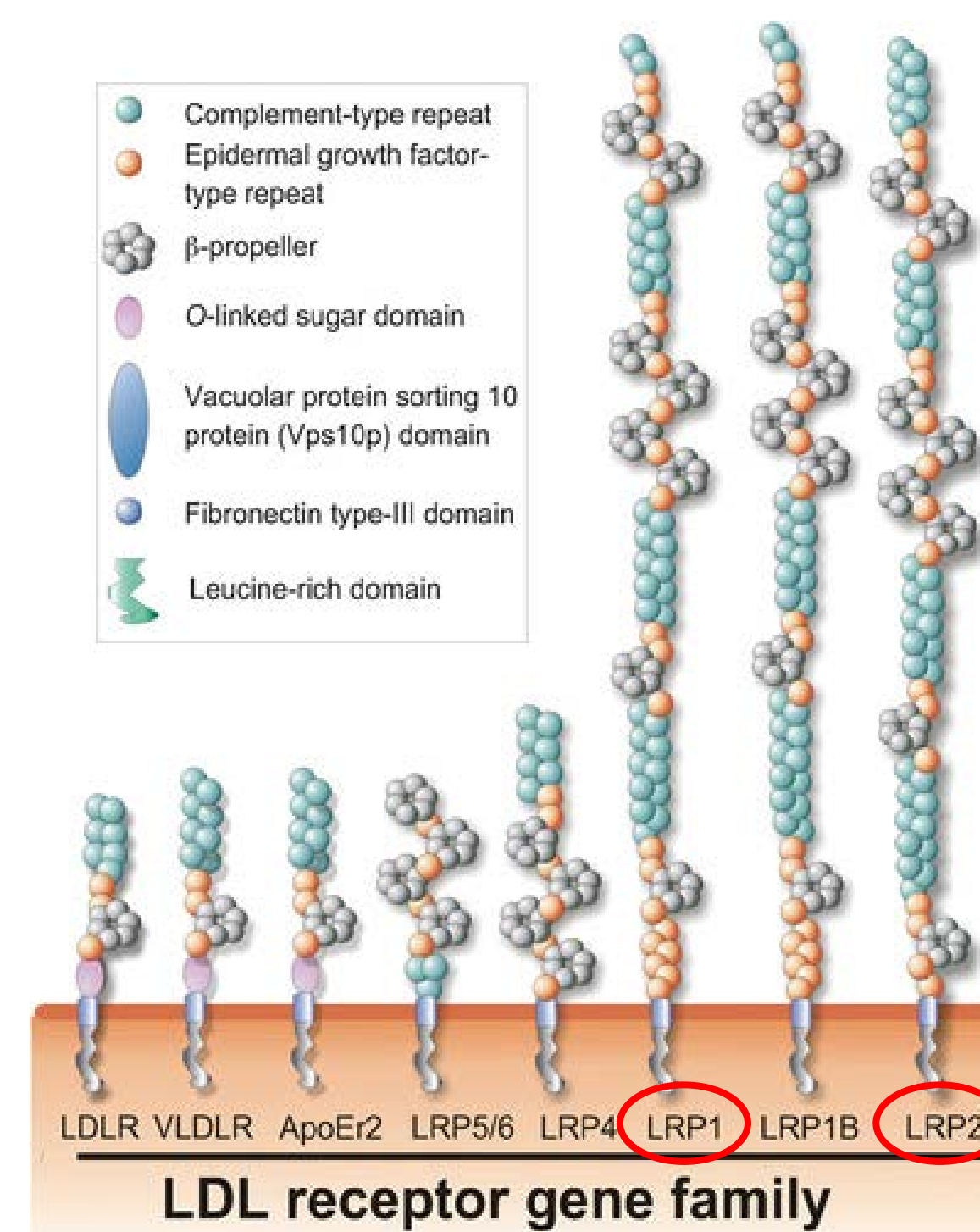


Background

Receptor-mediated endocytosis is the main mechanism whereby cells take up essential metabolites and signaling molecules. Consequently, dysfunction of endocytic receptors cause many devastating diseases in humans.

My research focuses on the functional characterization of endocytic receptors of the LDL receptor family, in particular LRP1 and LRP2 (megalin), elucidating the significance of the receptor pathways for development of kidney disease, hypertension, and neurodegenerative disorders.

We aim to study these processes at the molecular, cellular and organism level using transgenic animal models. Understanding the molecular mechanisms of these diseases has the potential to provide new treatment strategies. We collaborate with clinicians to translate our discoveries for the benefit of patients.



Projects and techniques

We study the involvement of endocytic receptor pathways in two main areas. In the first, we characterize the role of endocytic receptors in kidney disease and blood pressure regulation by the kidney. In the second, we explore endocytic pathways in neurons that may contribute to the underlying causes of Alzheimer's disease.

CURRENT PROJECT AREAS:

I) Receptor-mediated endocytosis in the kidney

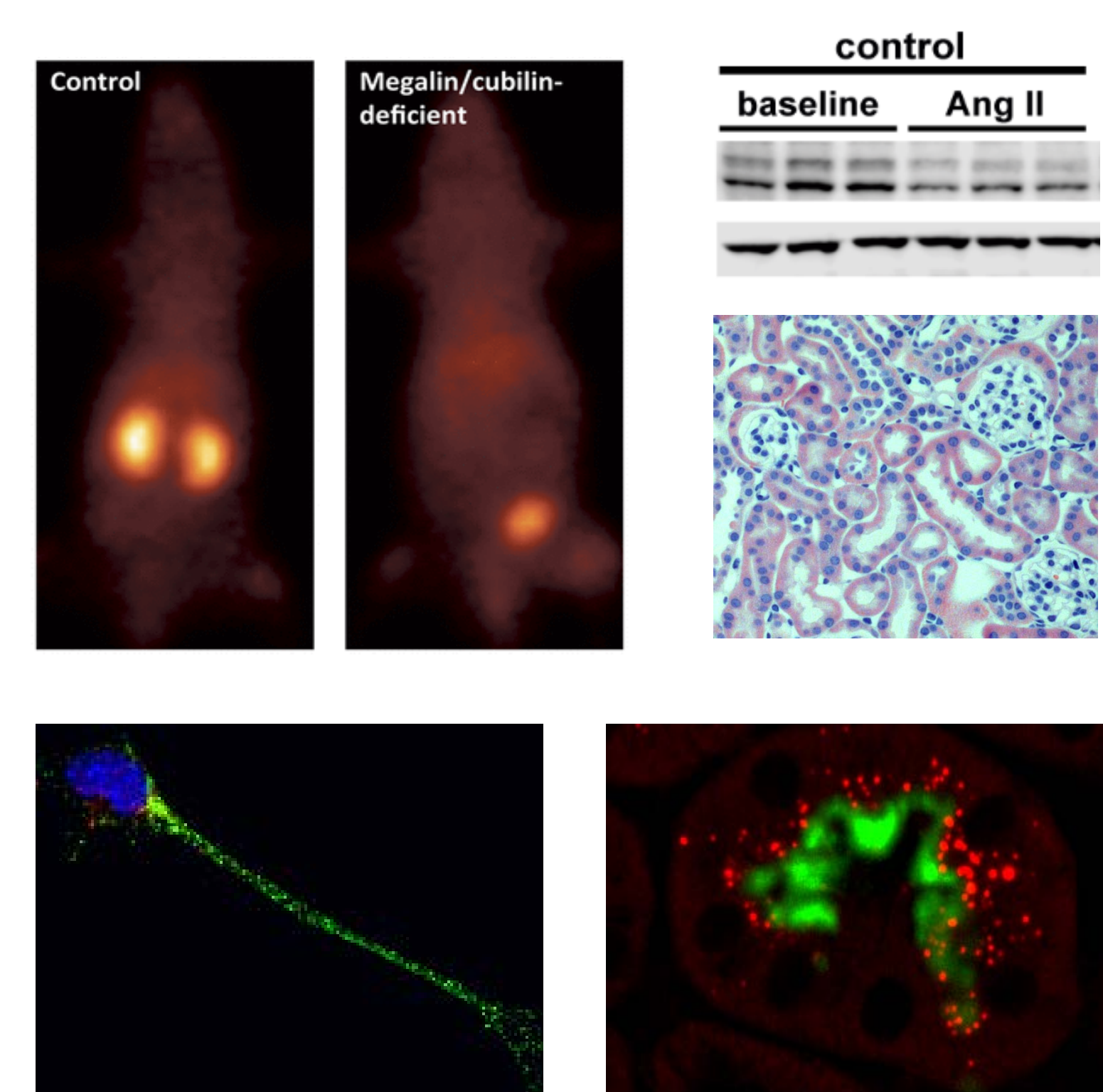
- Megalin receptor and chronic kidney disease
- Megalin receptor and blood pressure regulation

II) Receptor-mediated endocytosis in neuronal ApoE/A β uptake

- ApoE isoform effects on receptor function
- ApoE isoform effects on A β uptake by endocytic receptors

APPLIED TECHNIQUES:

We utilize a wide range of *in vitro* and *in vivo* techniques, including transgenic mouse models, tissue analysis by immunohistochemistry (light and confocal microscopy), protein analysis by Western blotting and ELISA, RNA sequencing (qRT-PCR, transcriptional analysis), culturing of cell lines and primary cells.



References

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- Christensen EI, Birn H, Storm T, Weyer K, Nielsen R. Endocytic receptors in the renal proximal tubule. *Physiology* (2012) 27(4):223-36