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Research projects:

Aldosterone, vascular and renal effects studied in human tissue and transgenic mice.

Role of non-L-type calcium channels for blood pressure regulation and kidney function studied in human and mice.

Area of Interest

The main interests of the lab are the vasculature, kidney function and blood pressure regulation. The evidence from our animal research form basis for our translational research using human material. The vascular effects of aldosterone are complex and include both dilatory responses and constrictor effects. A preponderance of constrictor versus dilator responses to aldosterone could be involved in the detrimental vascular actions of the hormone and clinical observations underline the substantial adverse effects of aldosterone on cardiovascular function. We have recently observed that aldosterone affects vascular contractility through histamine release. We focus on this novel phenomenon in human and mouse blood vessels. Furthermore, we investigate the association of aldosterone with normo-physiological and pathological states. It is studied in *in vivo* animal models and blood vessels from hypertensive and diabetic patients. Calcium channel blockers are widely used for treatment of hypertension as they inhibit voltage-gated calcium channels (Cav). The family of Cav consists of several subfamilies and we have previously elucidated the involvement of T-type Cav in contraction and relaxation of blood vessels. We investigate the importance of these channels in kidney function, blood vessels function and blood pressure regulation in man and mouse.

Methods and Techniques:

- Perfused resistance blood vessels and vessel myography
- Microdissection of nephron segments and microvessels
- PCR, Western, Co-immunoprecipitation, immunolocalization
- Cell culture,
- Aldosterone measurements
- Confocal microscopy/Ca^{2+}-imaging/ NO-measurements using DAF-FM
- Human kidney tissue and blood vessel (renal, mammary and brain) studies
- Blood pressure and renal function (GFR, RPF) measurements in conscious mice
- Pharmacological intervention with drug delivery in mice
- Transgenic and knock-out mice
- Metabolic cage studies of mice

The group:

Professor, Pernille B. Lærkegaard Hansen
Assistant professor, Per Svenningsen
Assistant professor, Henrik Diemke
Ph.d Student, Anne D. Thuesen
Ph.d Student, Line A. Mortensen
MD, Stine Finsen

Pregraduate student, Emil Dalgaard
Master Student, Kristina Lyngsoe
Bachelor Student, Louise Rasmussen
Technician, Kenneth Andersen
Technician, Vivi Monrad
Technician; Kristoffer Rosenstand

Publications:
Status 2014: 57 publications in for example JCI, PNAS, Circ Res. H-index 22.

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Hansen PB, Poulsen CB, Walter S, Marcussen N, Cribbs LL, Skøtt O, Jensen BL. Functional importance of L- and p/q-type voltage-gated calcium channels in human renal vasculature. Hypertension. 2011 Sep;58(3):464-70.

Schjerning J, Uhrenholt TR, Svenningsen P, Vanhoutte PM, Skott O, Jensen BL, Hansen PB. Histamine-dependent prolongation by aldosterone of vasoconstriction in isolated small mesenteric arteries of the mouse. Am J Physiol Heart Circ Physiol. 2013 Apr 15;304(8):H1094-102

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