

Expression of human somatostatin receptors and glucose transporters in carotid artery stenosis and aneurysms

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07-12-2018



Background

- Positron emission tomography (PET) imaging using ^{18}F -fluorodeoxyglucose (FDG) is a common technique to detect vessel wall metabolism as well as inflammation and it's mediated by various 14 types of glucose transporters (GLUTs)
- Somatostatin receptors (SSTRs) are potential more specific receptors for detecting inflammation
- Our objective: defining expression of GLUTs and SSTRs in atherosclerotic plaque and aneurysm; investigate SSTRs (and GLUT3) as a possible more specific target for vessel wall metabolism diagnostic than GLUT1

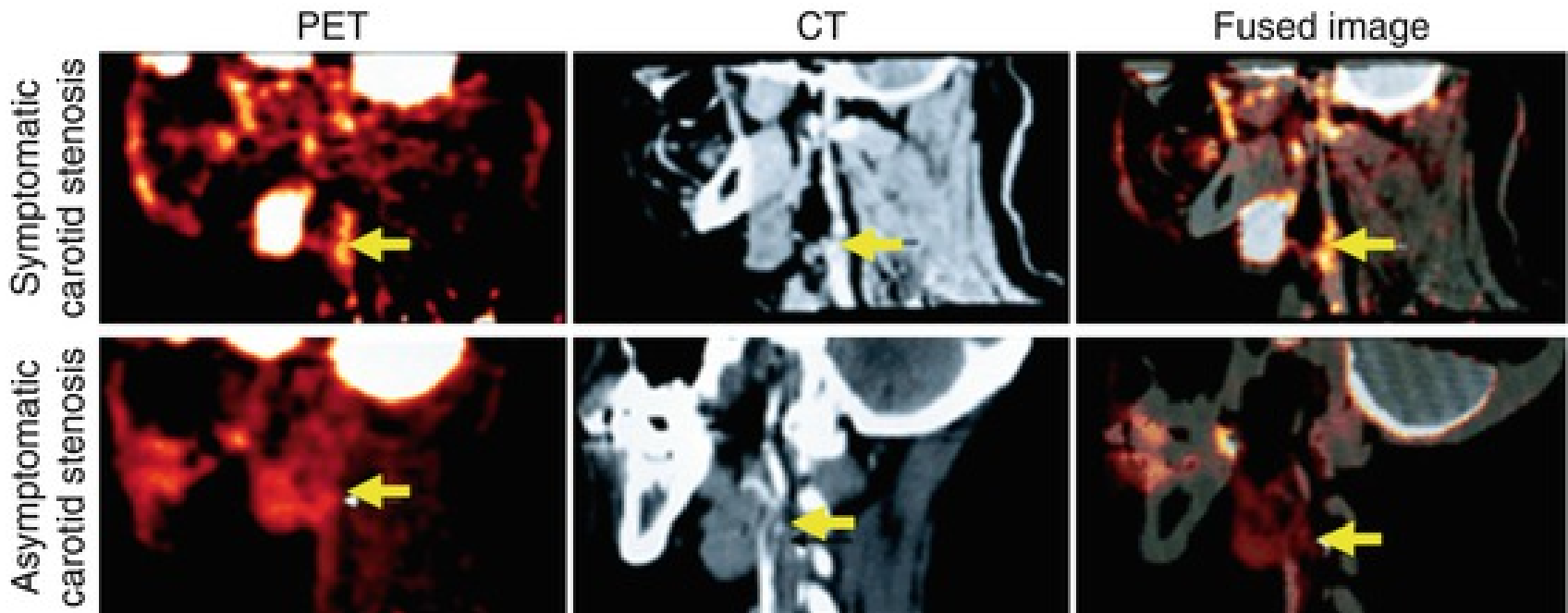
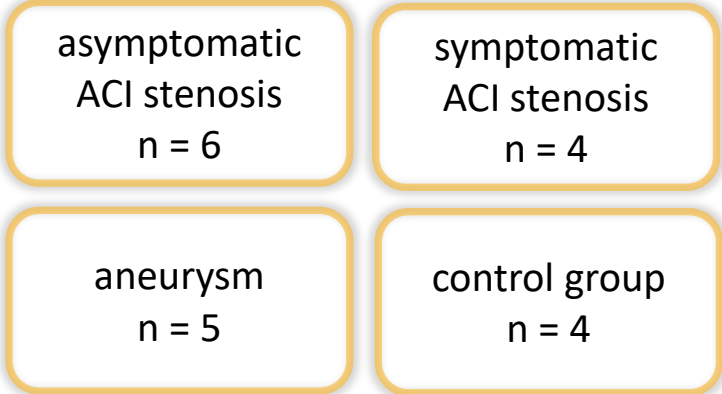


Fig. 1: <https://radiologykey.com/petct-imaging-of-inflammation-and-calcification/#CR21>, 2017-09-26

Methods



- Atherosclerotic plaques from patients with symptomatic and asymptomatic internal carotid artery stenosis collected during carotid endarterectomy
- Aneurysms: Abdominal aorta, A. poplitea, A. renalis
- Control group: Aorta; A. femoralis superfic.; A. subclavia; A. axillaris

cDNA synthesis

semiquantitative PCR

real-time PCR

SSTR1 - 5
GLUT1, 3

SSTR2, 3
GLUT1, 3

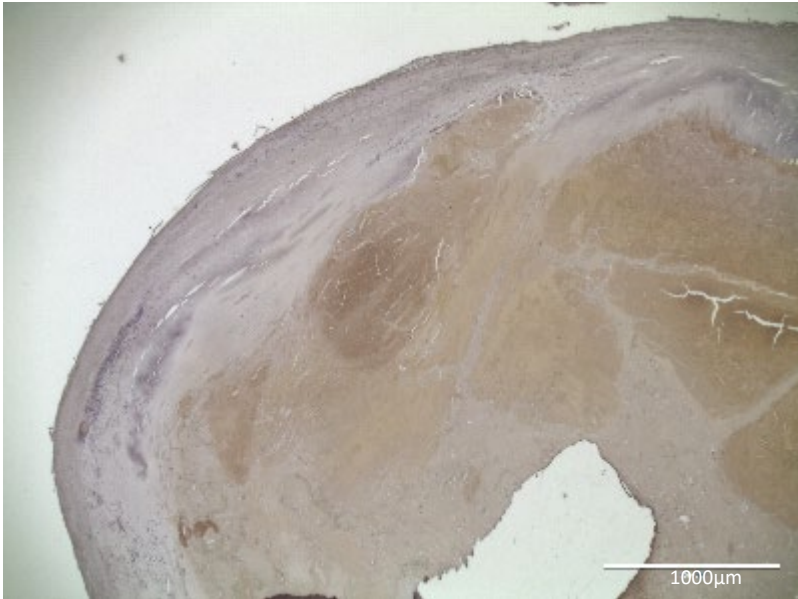


Fig 2: SSTR2 immunohistochemistry of an artery carotis interna plaque of

Results semiquantitative PCR

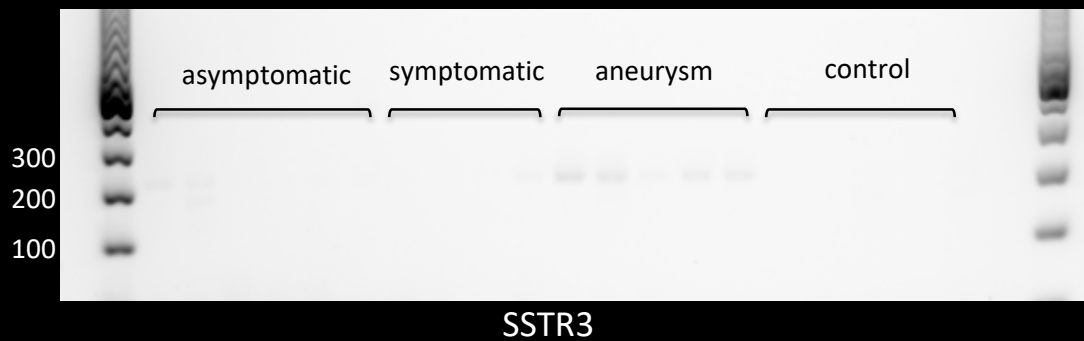
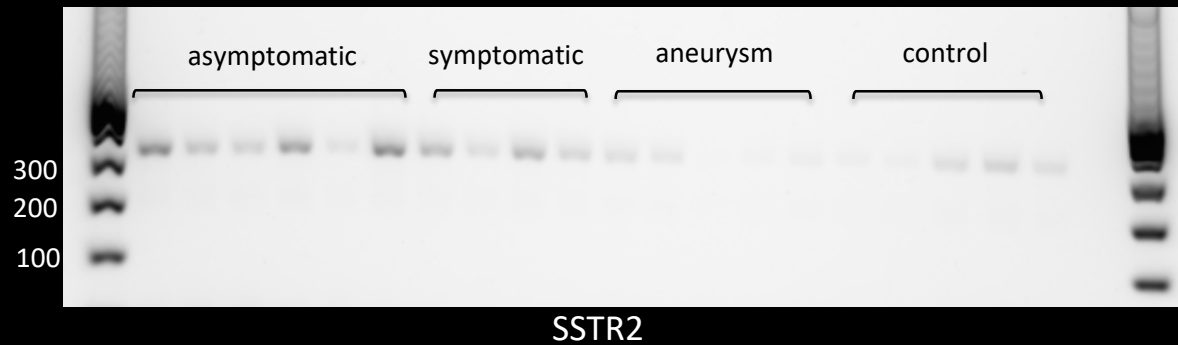
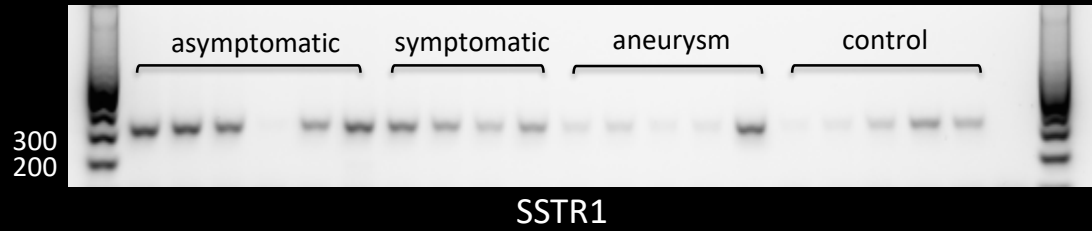


Fig 3-5: results of semiquantitative PCR of SSTR 1-3 of asymptomatic, symptomatic, Aneurysm and control group

Results – SSTR2 and SSTR3 expression

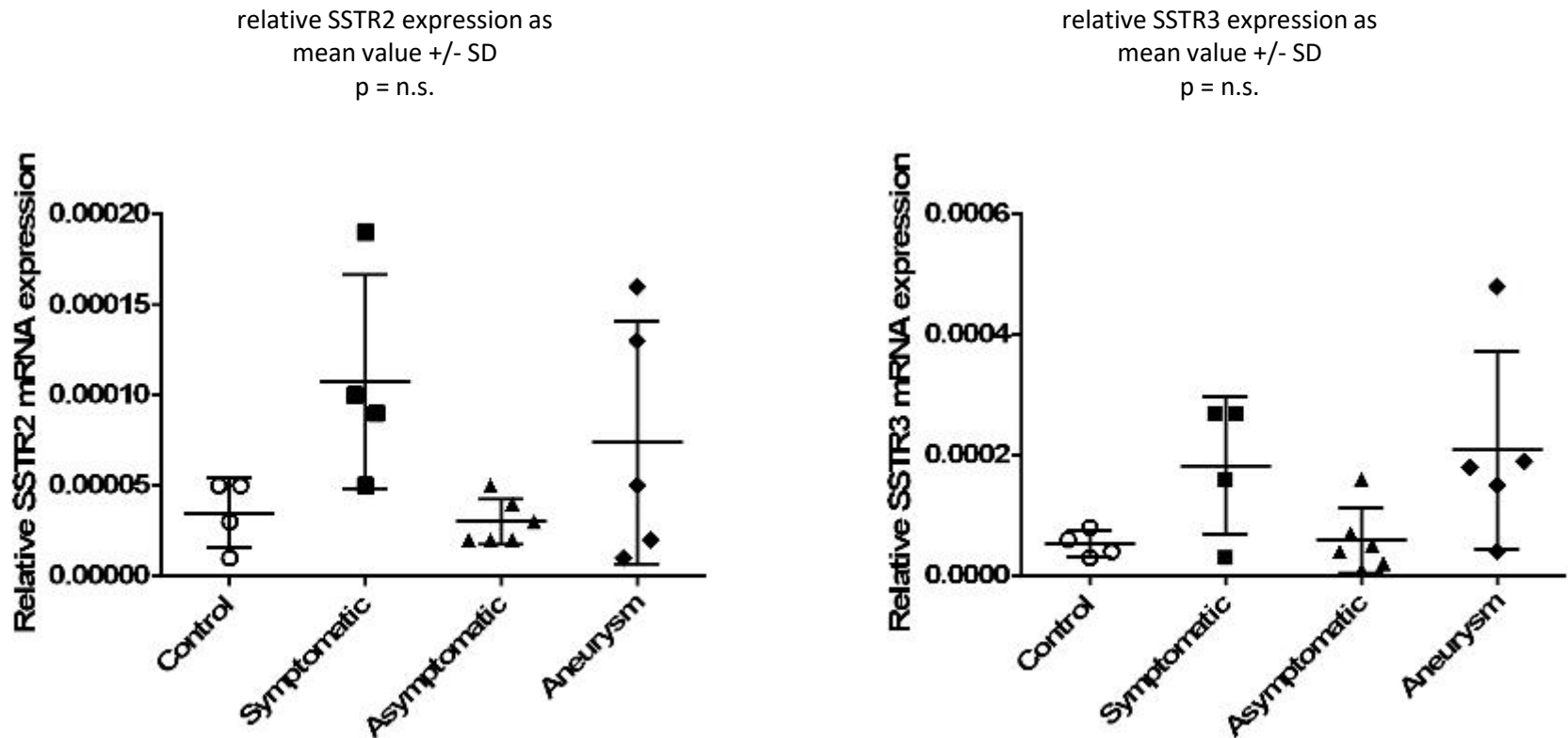
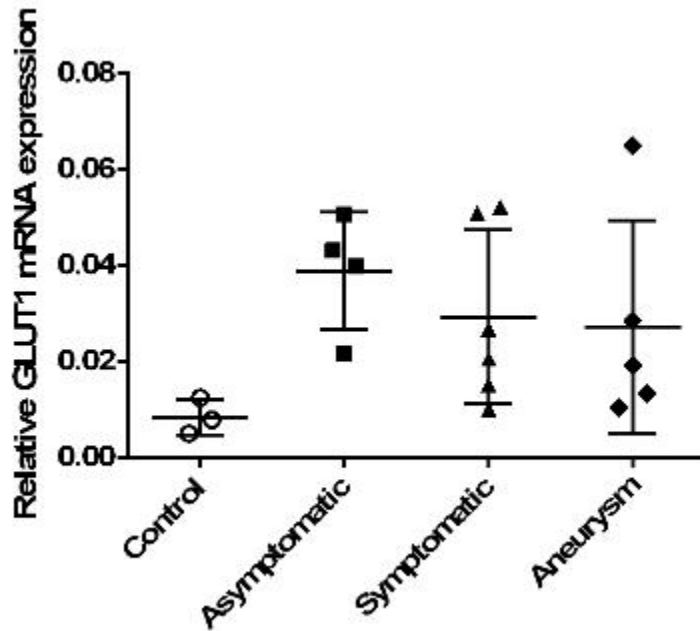


Fig 6 + 7: relative SSTR2 and SSTR3 mRNA expression as mean value +/- SD in controls, symptomatic and asymptomatic patients and Aneurysms; p = n.s. Statistic test: One-way ANOVA & Holm-Sidak; post hoc test

Results – GLUT1 and GLUT3 expression

relative GLUT1 expression as
mean value +/- SD
p = n.s.



relative GLUT3 expression as
mean value +/- SD

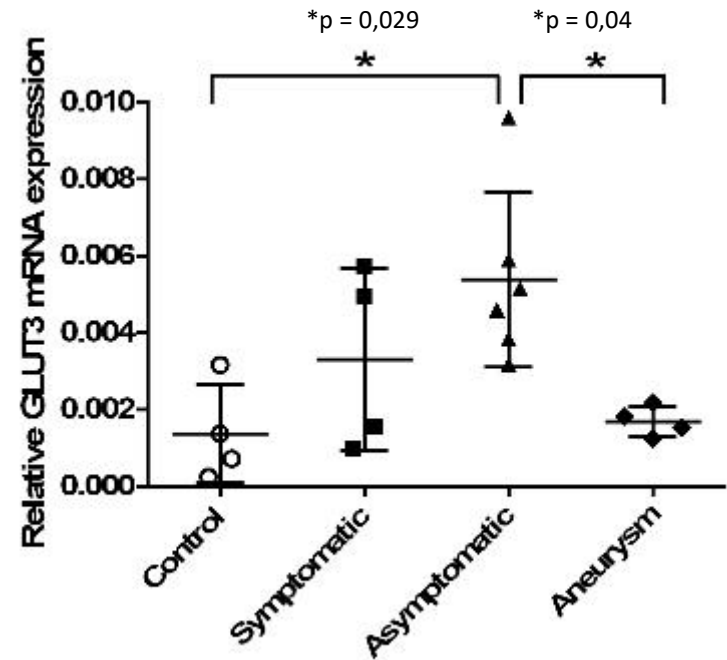


Fig 8 + 9: relative GLUT1 and GLUT3 mRNA expression as mean value +/- SD in controls, symptomatic and asymptomatic patients and Aneurysms; Control compared to asymptomatic p= 0.029; Asymptomatic compared to Aneurysm p= 0.04
Statistic test: One-way ANOVA & Holm-Sidack; post hoc test

Conclusion and preliminary results

- SSTR2 gene expression is not significantly increased compared to controls
- SSTR2 gene expression differed between symptomatic and asymptomatic patients in carotid artery stenosis
- GLUT3 gene expression is significantly increased in asymptomatic patients compared to controls and aneurysms
- Future directions:
 - Analysis of further samples to increase the number of analyzed patients
 - Evaluation of the exact cellular localization and of a disease-stage dependent expression is necessary

Acknowledgements to



- Prof. Dr. Christian Reeps
- Prof. Dr. Henning Morawitz
- Dr. Steffen Wolk
- Dr. Stefanie Tietze
- Dr. Anja Hofmann
- Pamela Sabarstinski



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Disclosure

Speaker name:

Joachim Schmidt

I have the following potential conflicts of interest to report:

- Consulting
- Employment in industry
- Stockholder of a healthcare company
- Owner of a healthcare company
- Other(s)

- I do not have any potential conflict of interest