

## **Alterations of protein expression of phospholamban, ZASP and plakoglobin in human atria in subgroups of seniors.**

Ulrich Gergs<sup>a\*</sup>, Winnie Mangold<sup>a</sup>, Frank Langguth<sup>a</sup>, Mechthild Hatzfeld<sup>b</sup>, Steffen Hauptmann<sup>c</sup>, Hasan Bushnaq<sup>d</sup>, Andreas Simm<sup>d</sup>, Rolf-Edgar Silber<sup>d</sup>, Joachim Neumann<sup>a</sup>

<sup>a</sup>Institut für Pharmakologie und Toxikologie, Medizinische Fakultät, Martin-Luther-Universität Halle-Wittenberg, 06097 Halle (Saale), Germany

<sup>b</sup>Institut für Pathophysiologie, Medizinische Fakultät, Martin-Luther-Universität Halle-Wittenberg, 06097 Halle (Saale), Germany

<sup>c</sup>Institut für Pathology, Medizinische Fakultät, Martin-Luther-Universität Halle-Wittenberg, 06097 Halle (Saale), Germany

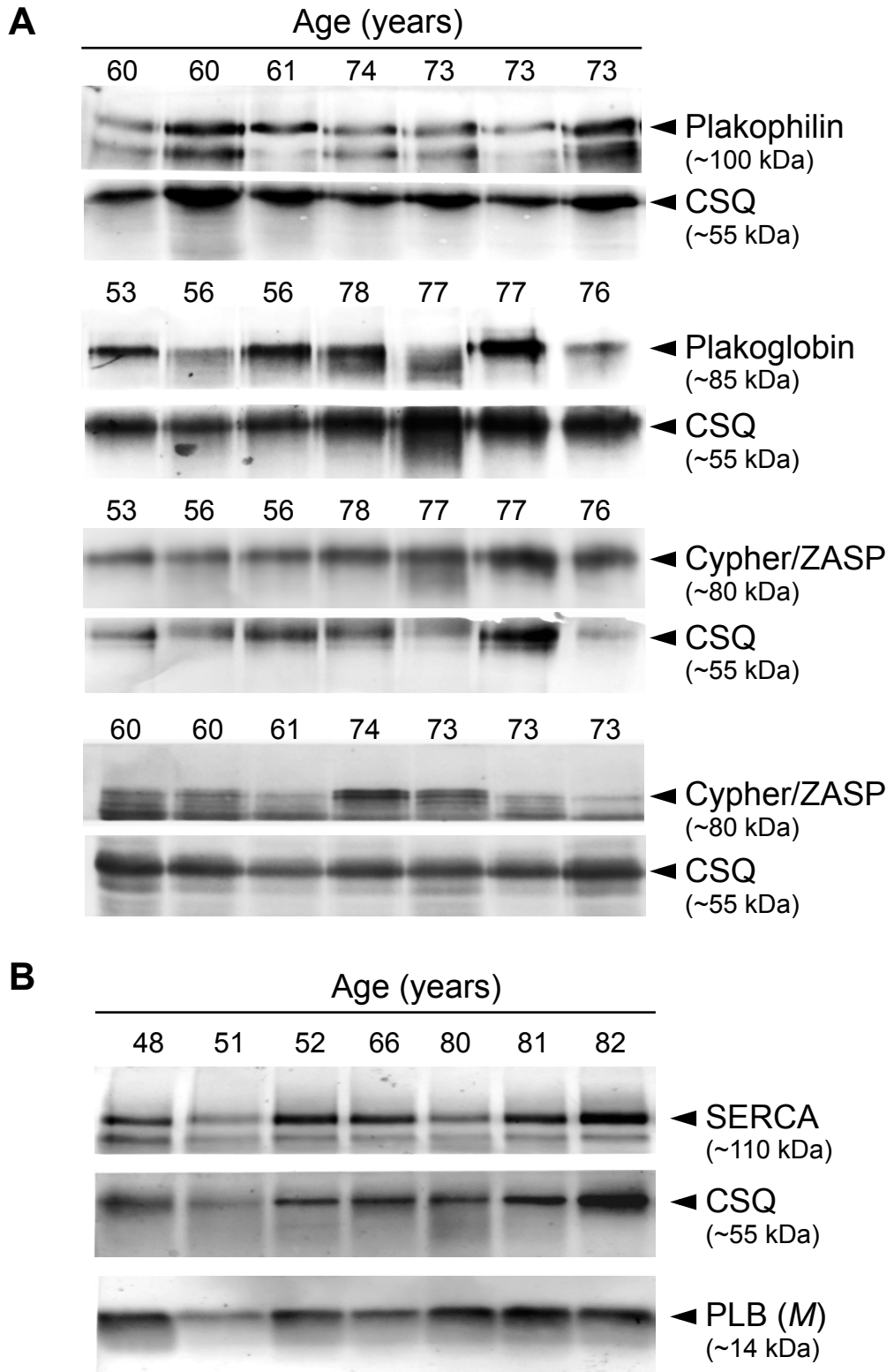
<sup>d</sup>Klinik für Herz- und Thoraxchirurgie, Medizinische Fakultät, Martin-Luther-Universität Halle-Wittenberg, 06097 Halle, Germany

Short title: Protein expression in human atria

\*Corresponding author: Ulrich Gergs, Institut für Pharmakologie und Toxikologie, Medizinische Fakultät, Martin-Luther-Universität Halle-Wittenberg, Magdeburger Str. 4, 06112 Halle (Saale), Germany

Tel.: +49-345-557 4093, Fax: +49-345-557 1835, E-mail: [ulrich.gergs@medizin.uni-halle.de](mailto:ulrich.gergs@medizin.uni-halle.de)

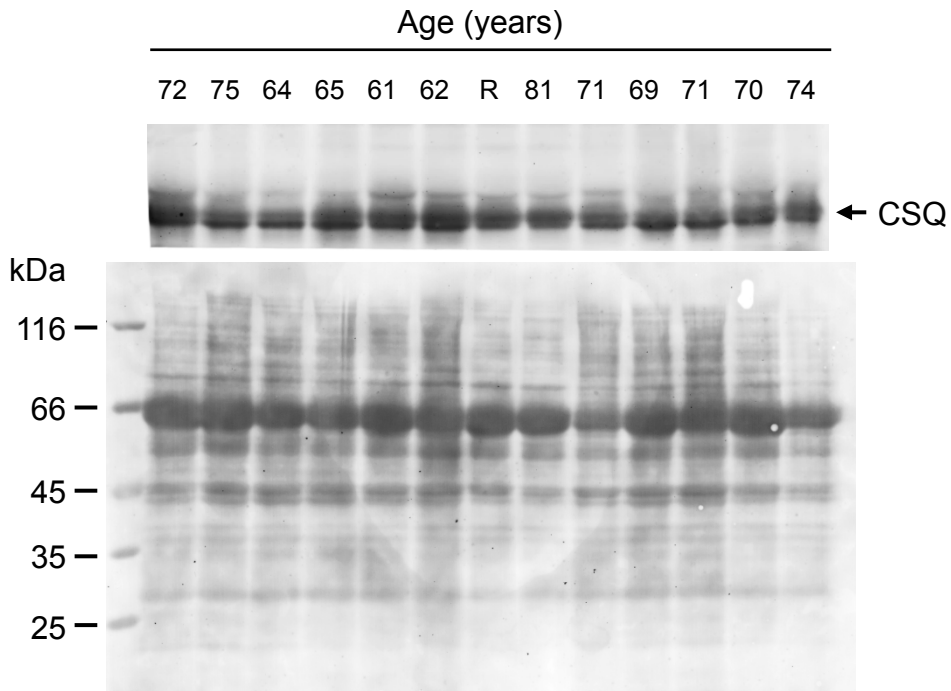
## Supplementary Figures



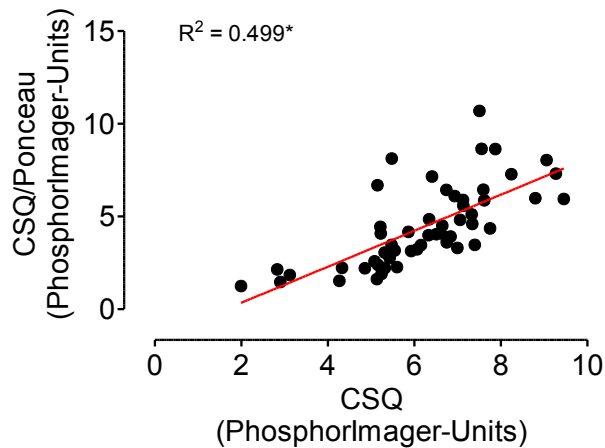
**Figure S1.** Examples of original Western blotting experiments. Expression of (A) plakophilin, plakoglobin, and the Z-band protein cypher 1 (Cypher/ZASP) and of (B) sarcoplasmic reticulum  $\text{Ca}^{2+}$ -ATPase (SERCA) and phospholamban (PLB) in human right atrium from patients of different age as indicated. Calsequestrin 2 (CSQ) expression was used as loading control. The corresponding CSQ blots are shown. These examples demonstrate the scattering of the Western blot experiments as discussed in the section “study limitations”.

# Supplementary Figures

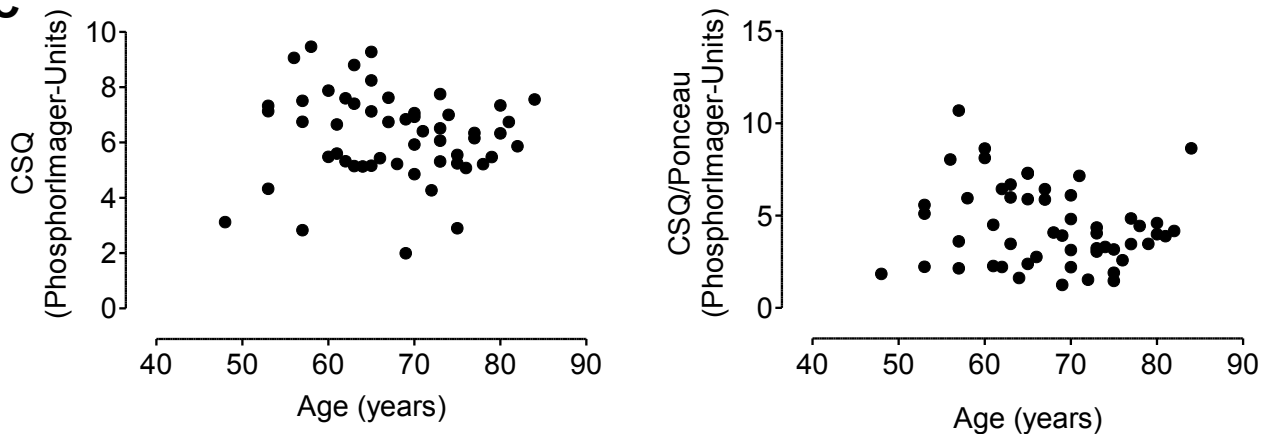
**A**



**B**

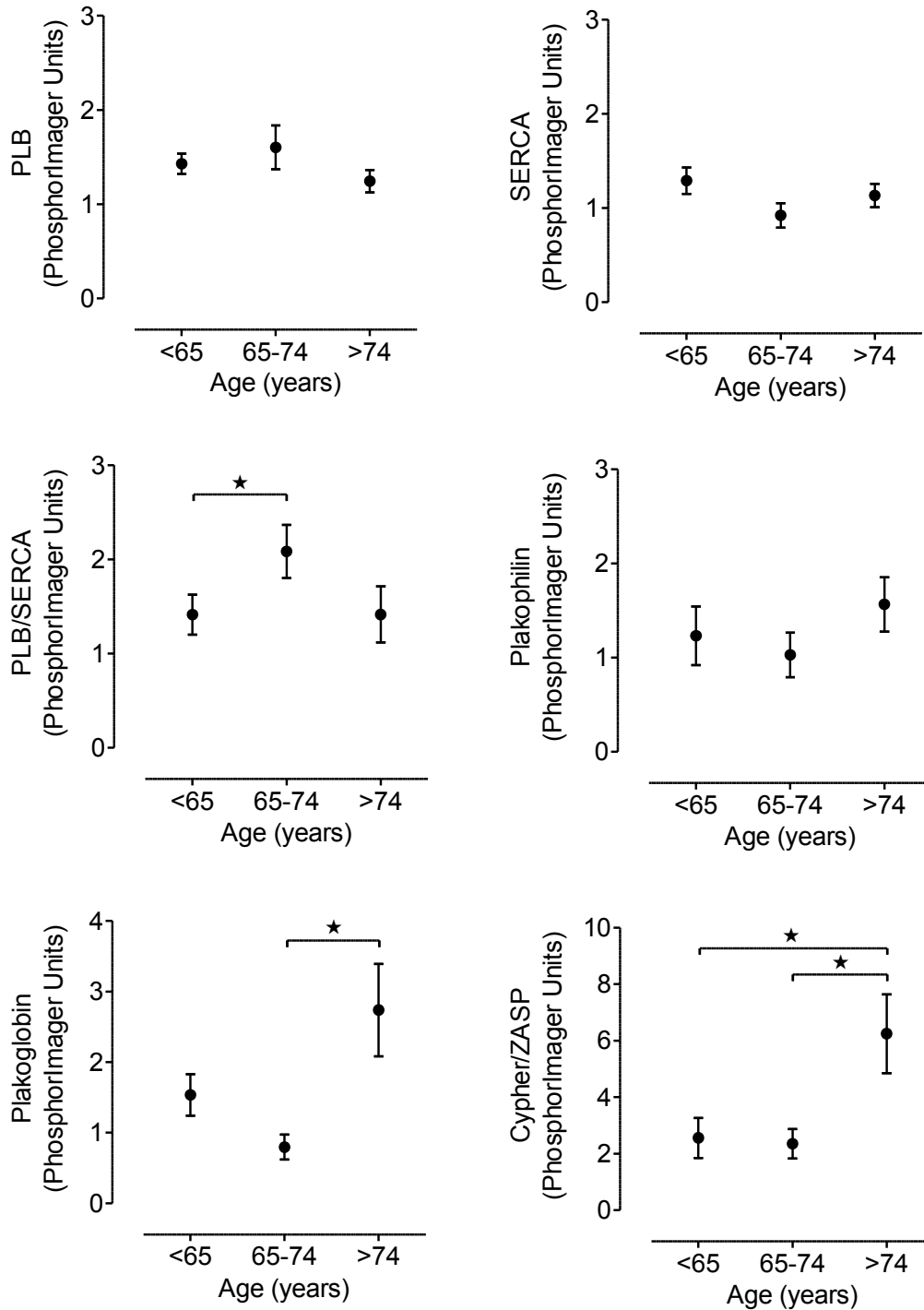


**C**



**Figure S2.** Expression of cardiac calsequestrin 2 (CSQ) in human right atrium. **(A)** One representative Western blot experiment for CSQ and the corresponding Ponceau S staining of the membrane. **(B)** Correlation of CSQ with CSQ normalized to Ponceau S staining. **(C)** Correlation of CSQ and normalized CSQ with age demonstrating no age-dependent CSQ expression in human right atrium. \* indicates a significant correlation ( $p < 0.05$ ).  $N(\text{total}) = 53$ .

## Supplementary Figures



**Figure S3.** Expression of phospholamban (PLB), sarcoplasmic reticulum  $\text{Ca}^{2+}$ -ATPase (SERCA), the ratio of PLB and SERCA (PLB/SERCA), plakophilin, plakoglobin, and the Z-band protein cypher 1 (Cypher/ZASP) in human right atrium. Protein expression data  $\pm$  SEM are categorized into three commonly used intervals. Ordinates are protein expression, normalized to cardiac calsequestrin in arbitrary PhosphorImager units versus age (abscissae). \*indicates a significant difference ( $p < 0.05$ ) between age groups calculated by ANOVA followed by Bonferroni's multiple comparison test.  $N(\text{total}) = 53$ ,  $N(<65) = 20$ ,  $N(65-74) = 19$ ,  $N(>74) = 14$ .

## Supplementary Tables

Table S1: Characteristics of patients included in the study.

Age (years)	NYHA	EF (%)	CCS	Statins	ASS	ACE inhibitor	AT1 receptor antagonist	β-Blocker
48	II - III	55	2	1	1	1	0	Metoprolol
51	II - III	65	2	1	1	1	0	Bisoprolol
52	II	60	2	0	0	0	0	Metoprolol
53	II	57	2	1	0	1	0	Metoprolol
53	II	52	2	1	1	1	0	Metoprolol
53	II	72	2	0	1	0	1	Metoprolol
56	II	65	1-2	1	1	1	0	Metoprolol
56	II	58	3	1	1	1	0	Metoprolol
57	II	76	3	1	0	1	0	Metoprolol
57	II	50	3	1	1	1	0	Bisoprolol
57	II	67	2	0	1	0	0	Bisoprolol
58	III	63	2	1	0	0	0	Metoprolol
60	II	60	2	1	1	1	0	Metoprolol
60	II	80	2	1	1	1	0	Bisoprolol
60	I	78	2-3	0	1	1	0	Bisoprolol
61	II	63	2	0	1	1	0	Metoprolol
62	III	40	2	1	0	1	0	Metoprolol
63	II	60	2	1	1	0	0	Metoprolol
63	II	70	2	1	1	1	0	Metoprolol
63	II	89	2	1	0	0	1	Metoprolol
65	II - III	55	2-3	1	1	1	0	Metoprolol
65	II	55	2	1	0	0	0	Metoprolol
65	II	71	3	0	1	1	0	Metoprolol
66	II	61	4	1	0	0	0	Bisoprolol
67	II	58	2	1	1	1	0	Bisoprolol
67	II	78	2	0	1	0	0	Metoprolol
68	II	35	2	0	1	1	0	Metoprolol
69	II	71	2	0	1	1	0	Carvedilol
69	II	72	2	1	1	0	0	Bisoprolol
70	II	75	2	1	1	1	0	Metoprolol
70	III	58	2	1	1	1	0	Metoprolol
70	II	65	3	1	1	0	0	Bisoprolol
70	II	74	2	1	1	1	0	Metoprolol
71	II	66	2-3	0	0	0	1	Metoprolol
73	II	62	2	1	0	0	0	Carvedilol
73	II	60	2	1	0	1	0	Metoprolol
73	II	46	2	1	0	0	0	Metoprolol
73	II	73	2	1	1	1	0	Metoprolol
74	II - III	35	2-3	1	1	1	0	Metoprolol
75	II	49	2	1	1	1	0	Metoprolol
75	II	44	2	1	1	0	1	Carvedilol
75	II	75	2-3	1	1	1	0	Metoprolol
76	I	74	2	0	0	1	0	Bisoprolol
76	II	70	2	1	1	1	0	Bisoprolol
77	III	50	2	1	1	1	0	Metoprolol
77	II	65	4	0	0	1	0	Metoprolol
78	II	55	2	1	1	1	0	Metoprolol
79	II	62	3	1	1	1	0	Carvedilol
80	I	71	1	1	0	1	0	Metoprolol
80	II	70	3	0	1	1	0	Bisoprolol
81	II	60	2	1	1	0	0	Bisoprolol
82	II	56	2	0	1	1	0	Metoprolol
84	I	60	4	1	1	1	0	Metoprolol

NYHA, New York Heart Association classification of heart failure

EF, left ventricular ejection fraction in %

CCS, Canadian Cardiovascular Society angina class

ASS, acetylsalicylic acid

ACE, angiotensin-converting enzyme

AT1 receptor, angiotensin II receptor type 1

In the columns for medications, "1" means yes and "0" means no.