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SGLT2 independent effects of the SGLT2 inhibitor empagliflozin

Focus on the heart

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PhD portfolio

PhD student Name: Sha Chen
 PhD period: 2020 - 2024
 PhD supervisor Name: Coert J. Zuurbier

1. PhD training

	Year	Workload (ECTs)
General courses:		
• Scientific writing in English	2019	1.5
• Practical biostatistics	2019	1.4
Specific courses:		
• Research Data Management	2020	0.4
• Advanced topics in biostatistics	2021	1.5
• Laboratory Animals Science	2022	3.9
• Systematic reviews	2022	0.7
• Presentations:		
• Sodium Glucose Cotransporter-2 Inhibitor Empagliflozin Reduces Infarct Size Independently of Sodium Glucose Cotransporter-2 (Oral presentation at European society of Cardiology, Barcelona, Spain).	2022	1
• Exploring Empagliflozin direct cardiac effects reveals a role for RSK inhibition: EMPA reduced hypertrophy through RSK/NHE-1 inhibition. (Poster presentation at Annual Amsterdam Cardiovascular Sciences Symposium, Amsterdam, the Netherlands).	2022	0.5
• Sodium Glucose Cotransporter-2 Inhibitor Empagliflozin Reduces Infarct Size Independently of Sodium Glucose Cotransporter-2. (Oral presentation at Rembrandt Symposium, Leiden, Netherlands).	2022	1

- **Exploring Empagliflozin direct cardiac effects reveals a role for RSK inhibition: EMPA reduced hypertrophy through RSK/NHE-1 inhibition** ((Poster presentation at International Society for Heart Research, Berlin, Germany). 2022 0.5
- **Empagliflozin prevents diastolic and systolic dysfunction in heart failure** (Poster presentation at America heart association, Philadelphia, the United States). 2023 0.5
- **Exploring Empagliflozin direct cardiac effects reveals a role for RSK inhibition: EMPA reduced hypertrophy through RSK/NHE-1 inhibition** (Poster presentation at Dutch German Joint Meeting, Wurzburg, Germany). 2023 0.5
- **Empagliflozin prevents diastolic and systolic dysfunction in heart failure and reduces cardiac NHE1 activity, independent of SGLT2** (Oral presentation at Annual Amsterdam Cardiovascular Sciences Symposium, Amsterdam, the Netherlands). 2023 1
- **Empagliflozin prevents heart failure and reduces cardiac infarction independent of SGLT2** (Oral presentation at European Association for the Study of Diabetes, Oxford, the United Kingdom). 2023 1
- **Empagliflozin prevents heart failure through inhibition of the NHE1-NO pathway, independent of SGLT2** (Poster presentation at Cost action MetaHeart CA 22169, Antalya, Turkey). 2024 0.5

(Inter)national conferences:

- Cost action Cardioprotection CA16225 2021 0.3
- Rembrandt Symposium, Leiden, Netherlands 2022 1
- European society of Cardiology, Barcelona, Spain 2022 1

- Annual Amsterdam Cardiovascular Sciences Symposium, Amsterdam, the Netherlands 2022 0.3
- International Society for Heart Research, Berlin, Germany 2022 1
- Annual Amsterdam Cardiovascular Sciences Symposium, Amsterdam, the Netherlands 2023 0.3
- Dutch German Joint Meeting, Wurzburg, Germany 2023 1
- European Association for the Study of Diabetes, Oxford, the United Kingdom 2023 1
- America heart association, Philadelphia, the United States 2023 1
- Cost action MetaHeart CA 22169 2024 1

Others:

- LEICA weekly progress meetings 2020-2024 12

2. Teaching

	Year	Workload (ECTs)
Master internship, Wageningen University, Wageningen	2021	2.5
Master internship, University of Amsterdam, Amsterdam	2022	2.5
Master internship, University of Amsterdam, Amsterdam	2023	2.5
Master internship, University of Amsterdam, Amsterdam	2024	2.5

3. Peer-reviewed publications

	Year
Published	

- Zhang H, Uthman L, Bakker D, Sari S, Chen S, Hollmann MW, Coronel R, Weber NC, Houten SM, van Weeghel M, Zuurbier CJ. **Empagliflozin Decreases Lactate Generation in an NHE-1 Dependent Fashion and Increases α -Ketoglutarate Synthesis From Palmitate in Type II Diabetic Mouse Hearts.** Front Cardiovasc Med. 2020 Dec 4;7:592233. 2020
- Chen S, Coronel R, Hollmann MW, Weber NC, Zuurbier CJ. **Direct cardiac effects of SGLT2 inhibitors.** Cardiovasc Diabetol. 2022 Mar 18;21(1):45. 2022
- Chen S*, Wang Q*, Christodoulou A*, Mylonas N, Bakker D, Nederlof R, Hollmann MW, Weber NC, Coronel R, Wakker V, Christoffels VM, Andreadou I, Zuurbier CJ. **Sodium Glucose Cotransporter-2 Inhibitor Empagliflozin Reduces Infarct Size Independently of Sodium Glucose Cotransporter-2.** Circulation. 2023 Jan 17;147(3):276-279. * Equally contributed 2023
- Chen S, Schumacher CA, Van Amersfoort SCM, Fiolet JWT, Baartscheer A, Veldkamp MW, Coronel R, Zuurbier CJ. **Protease XIV abolishes NHE inhibition by empagliflozin in cardiac cells.** Front Physiol. 2023 Jul 26;14:1179131. 2023
- Chen S, Overberg K, Ghouse Z, Hollmann MW, Weber NC, Coronel R, Zuurbier CJ. **Empagliflozin mitigates cardiac hypertrophy through cardiac RSK/NHE-1 inhibition.** Biomed Pharmacother. 2024 Mar 23;174:116477. 2024

Under Revision

- Sha Chen, Qian Wang, Diane Bakker, Xin Hu, Liping Zhang, Inge van der Made, Anne M. Tebbens, Csenger Kovácsházi, Zoltán Gircz, Gábor B Brenner, Peter Ferdinandy, Gert Schaart, Anne Gemmink, Matthijs K.C. Hesselink, Mathilde R. Rivaud, Markus W Hollmann, Nina C Weber, Esther E. Creemers, Ruben Coronel, MD, Coert J Zuurbier. **SGLT2-independent mechanisms of protection against heart failure by Empagliflozin.** 2024

In preparation

- Sha Chen*, Xin Hu*, Qian Wang, Diane Bakker, Inge van der Made, Markus W Hollmann, Nina C Weber, Esther E. Creemers, Ruben Coronel, MD, Coert J Zuurbier. **Empagliflozin improves heart failure via the modulation of glycolysis.** * Equally contributed 2024

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