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Novel strategies to investigate lipoprotein metabolism and combat cardiometabolic disease

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LIST OF PUBLICATIONS

1. **Ying Z***, van der Schatte Olivier A*, Pereira PM, Kooijman EJM, Ge X, Afkir S, Van Velden FHP, Pereira Arias-Bouda LM, van der Wildt B, Beaino W, Kooijman S, Windhorst AD[#] and Rensen PCN[#]. Development of a glycerol tri[¹⁸F]oleate tracer that outperforms [¹⁸F]fluorodeoxyglucose in tracing the metabolic activity of brown adipose tissue with PET-CT imaging. *In preparation*.
2. Kovynev A*, **Ying Z***, Lambooi JM, Guigas B, Rensen PCN and Schönke M. Late exercise training outperforms early exercise training in attenuating non-alcoholic fatty liver disease. *In preparation*.
3. Li S, **Ying Z**, Gentenaar M, Rensen PCN, Kooijman S, Visser J, Meijer OM and Kroon J. Glucocorticoid receptor antagonism improves glucose metabolism in a mouse model of chronic dihydrotestosterone exposure. *Submitted*.
4. Kovynev A*, **Ying Z***, Lambooi JM, van der Zande HJP, Guigas B, Rensen PCN and Schönke M. Early but not late exercise training in mice exacerbates hepatic inflammation in developing non-alcoholic fatty liver disease. **Journal of Clinical and Translational Hepatology 2023**; 11: 1282-1285.
5. **Ying Z***, van Eenige R*, Ge X, van Marwijk C, Lambooi JM, Guigas B, Giera M, de Boer JF, Coskun T, Qu H, Wang Y, Boon MR, Rensen PCN and Kooijman S. Combined GIP receptor and GLP1 receptor agonism attenuates NAFLD in male APOE*3-Leiden.CETP mice. **eBioMedicine 2023**; 93: 104684.
6. van Eenige R*, **Ying Z***, Tramper N, Wiebing V, Siraj Z, de Boer JF, Lambooi JM, Guigas B, Qu H, Coskun T, Rensen PCN and Kooijman S. Combined glucose-dependent insulinotropic polypeptide receptor and glucagon-like peptide-1 receptor agonism attenuates atherosclerosis severity in APOE*3-Leiden.CETP mice. **Atherosclerosis 2023**; 372: 19-31.
7. **Ying Z***, van Eenige R*, Beerepoot R, Boon MR, Kloosterhuis NJ, van de Sluis B, Bartelt A, Rensen PCN and Kooijman S. Mirabegron-induced brown fat activation does not exacerbate atherosclerosis in mice with a functional hepatic ApoE-LDLR pathway. **Pharmacological Research 2023**; 187: 106634.
8. **Ying Z**, Tramper N, Zhou E, Boon MR, Rensen PCN and Kooijman S. Role of thermogenic adipose tissue in lipid metabolism and atherosclerotic cardiovascular disease: lessons from studies in mice and humans [review]. **Cardiovascular Research 2023**; 119: 905-918.
9. Schönke M, **Ying Z**, Kovynev A, In het Panhuis W, Binnendijk A, van der Poel S, Pronk ACM, Streefland TCM, Hoekstra M, Kooijman S and Rensen PCN. Time to run: Late rather than early exercise training in mice remodels the gut microbiome

and reduces atherosclerosis development. **The FASEB Journal** **2023**; 37: e22719.

10. Li Z, Zhou E, Liu C, Wicks H, Yildiz S, Razack F, **Ying Z**, Kooijman S, Koonen DPY, Heijink M, Kostidis S, Giera M, Sanders IMJG, Kuijper EJ, Smits WK, van Dijk KW, Rensen PCN and Wang Y. Dietary butyrate ameliorates metabolic health associated with selective proliferation of gut *Lachnospiraceae* bacterium 28-4. **JCI insight** **2023**; 8: e166655.
11. Straat ME*, Jurado-Fasoli L*, **Ying Z**, Nahon KJ, Janssen LGM, Boon MR, Grabner GF, Kooijman S, Zimmermann R, Giera M, Rensen PCN and Martinez-Tellez B. Cold exposure induces dynamic changes in circulating triacylglycerol species, which is dependent on intracellular lipolysis: A randomized cross-over trial. **eBioMedicine** **2022**; 86: 104349.
12. **Ying Z**, Boon MR, Coskun T, Kooijman S and Rensen PCN. A simplified procedure to trace triglyceride-rich lipoprotein metabolism *in vivo*. **Physiological Reports** **2021**; 9: e14820.
13. van Eenige R, **Ying Z**, Tambyrajah L, Pronk ACM, Blomberg N, Giera M, Wang Y, Coskun T, van der Stelt M, Rensen PCN and Kooijman S. Cannabinoid type 1 receptor inverse agonism attenuates dyslipidemia and atherosclerosis in APOE*3-Leiden.CETP mice. **Journal of Lipid Research** **2021**; 62: 100070.
14. Zhou E, Li Z, Nakashima H, Liu C, **Ying Z**, Foks AC, Berbée JFP, van Dijk KW, Rensen PCN and Wang Y. Hepatic scavenger receptor class B type 1 knockdown reduces atherosclerosis and enhances the antiatherosclerotic effect of brown fat activation in APOE*3-Leiden.CETP mice. **Arteriosclerosis, Thrombosis, and Vascular Biology** **2021**; 41: 1474-1486.

*,#Authors contributed equally.

CURRICULUM VITAE

Zhixiong Ying was born on December 23rd, 1992, in Nanping, Fujian province, China. In June 2011, he obtained his high school diploma at The Senior School of Nanping, China.

In September 2011, he started his bachelor's study at Nanjing Agricultural University, Nanjing, China, and majored in Animal Science. Four years later, he graduated and obtained his bachelor degree (with honors). In September 2015, at the same university, Zhixiong enrolled in the master's program, Animal Nutrition and Feed Science. For his master's thesis, he joined the group of Prof. dr. Tian Wang and worked on a 3-year research project entitled 'Effects of dietary methionine restriction on glucose metabolism and insulin sensitivity in intrauterine growth retarded pigs'. In June 2018, he graduated and obtained his master's degree (with honors).

In 2018, Zhixiong was granted a scholarship from China Scholarship Council, which allowed him to start his PhD training in the group of Prof. dr. Patrick Rensen within the Division of Endocrinology at the Department of Medicine of the Leiden University Medical Center in the Netherlands. Under the supervision of Prof. dr. Patrick Rensen, dr. Sander Kooijman and dr. Mariëtte Boon, he focused on exploring novel strategies to investigate and combat cardiometabolic diseases. The majority of his doctoral research, which is presented in this thesis, was completed by 2022.

In February 2023, Zhixiong started as a post-doctoral researcher at Amsterdam University Medical Center under the supervision of dr. Piter Bosma, focusing on etiology and therapeutic strategies of liver diseases.

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