



Universiteit
Leiden
The Netherlands

Non-invasive assessment of human brown adipose tissue: development of robust imaging methods to facilitate clinical translation

Sardjoe Mishre, A.S.D.

Citation

Sardjoe Mishre, A. S. D. (2023, September 5). *Non-invasive assessment of human brown adipose tissue: development of robust imaging methods to facilitate clinical translation*. Retrieved from <https://hdl.handle.net/1887/3638467>

Version: Publisher's Version

License: [Licence agreement concerning inclusion of doctoral thesis in the Institutional Repository of the University of Leiden](#)

Downloaded from: <https://hdl.handle.net/1887/3638467>

Note: To cite this publication please use the final published version (if applicable).

REFERENTIES

1. Cypess AM, Lehman S, Williams G, et al. Identification and importance of brown adipose tissue in adult humans. *N Engl J Med*. 2009;360(15):1509-1517. doi:10.1056/NEJMoa0810780
2. Van Marken Lichtenbelt WD, Vanhommerig JW, Smulders NM, et al. Cold-activated brown adipose tissue in healthy men. *N Engl J Med*. 2009;360(15):1500-1508. doi:10.1056/NEJMoa0808718
3. Virtanen KA, Lidell ME, Orava J, et al. Functional Brown Adipose Tissue in Healthy Adults. *N Engl J Med*. 2009;360(15):1518-1525. doi:10.1056/nejmoa0808949
4. Hanssen MJW, Hoeks J, Brans B, et al. Short-term cold acclimation improves insulin sensitivity in patients with type 2 diabetes mellitus. *Nat Med*. 2015;21(8):863-865. doi:10.1038/nm.3891
5. Oikonomou EK, Antoniadou C. The role of adipose tissue in cardiovascular health and disease. *Nat Rev Cardiol*. 2019;16(2):83-99. doi:10.1038/s41569-018-0097-6
6. Becher T, Palanisamy S, Kramer DJ, et al. Brown adipose tissue is associated with cardiometabolic health. *Nat Med*. 2021;27(1):58-65. doi:10.1038/S41591-020-1126-7
7. Schilperoort M, Hoeke G, Kooijman S, Rensen PCN. Relevance of lipid metabolism for brown fat visualization and quantification. *Curr Opin Lipidol*. 2016;27(3):242-248. doi:10.1097/MOL.0000000000000296
8. Neves EB, Vilaça-Alves J, Nogueira IRA, Reis VMH. Influence of Subcutaneous Fat Layer in Skin Temperature. *Motricidade*. 2015;11(4):120-126. doi:10.6063/MOTRICIDADE.5999
9. Karampinos DC, Weidlich D, Wu M, Hu HH, Franz D. Techniques and Applications of Magnetic Resonance Imaging for Studying Brown Adipose Tissue Morphometry and Function. *Handb Exp Pharmacol*. 2019;251:299-324. doi:10.1007/164_2018_158
10. Wu M, Junker D, Branca RT, Karampinos DC. Magnetic Resonance Imaging Techniques for Brown Adipose Tissue Detection. *Front Endocrinol (Lausanne)*. 2020;11:421. doi:10.3389/FENDO.2020.00421/FULL

7.3 LIST OF PUBLICATIONS

In 2019

1. Nahon KJ, Janssen LGM, **Sardjoe Mishre ASD**, Bilsen MP, van der Eijk JA, Botani K, Overduin LA, Ruiz JR, Burakiewicz J, Dzyubachyk O, Webb AG, Kan HE, Berbée JFP, van Klinken JB, van Dijk KW, van Weeghel M, Vaz FM, Coskun T, Jazet IM, Kooijman S, Martinez-Tellez B, Boon MR, Rensen PCN. The effect of mirabegron on energy expenditure and brown adipose tissue in healthy lean South Asian and European men. *Diabetes, Obesity and Metabolism*. 2020 Nov;22(11):2032-2044. doi: 10.1111/dom.14120.

In 2020

2. Janssen LGM, Nahon KJ, Bracké KFM, van den Broek D, Smit R, **Sardjoe Mishre ASD**, Koorneef LL, Martinez-Tellez B, Burakiewicz J, Kan HE, van Velden FHP, Pereira Arias-Bouda LM, de Geus-Oei LF, Berbée JFP, Jazet IM, Boon MR, Rensen PCN. Twelve weeks of exenatide treatment increases [¹⁸F]fluorodeoxyglucose uptake by brown adipose tissue without affecting oxidative resting energy expenditure in nondiabetic males. *Metabolism*. 2020 May;106:154167. doi: 10.1016/j.metabol.2020.154167.

3. Abreu-Vieira G, **Sardjoe Mishre ASD**, Burakiewicz J, Janssen LGM, Nahon KJ, van der Eijk JA, Riem TT, Boon MR, Dzyubachyk O, Webb AG, Rensen PCN, Kan HE. Human Brown Adipose Tissue Estimated With Magnetic Resonance Imaging Undergoes Changes in Composition After Cold Exposure: An in vivo MRI Study in Healthy Volunteers. *Frontiers in Endocrinology*. 2020 Jan 9;10:898. doi: 10.3389/fendo.2019.00898.

4. Nahon KJ, Janssen LGM, **Sardjoe Mishre ASD**, Bilsen MP, van der Eijk JA, Botani K, Overduin LA, Ruiz JR, Burakiewicz J, Dzyubachyk O, Webb AG, Kan HE, Berbée JFP, van Klinken JB, van Dijk KW, van Weeghel M, Vaz FM, Coskun T, Jazet IM, Kooijman S, Martinez-Tellez B, Boon MR, Rensen PCN. The effect of mirabegron on energy expenditure and brown adipose tissue in healthy lean South Asian and European men. *Diabetes, Obesity and Metabolism*. 2020 Nov;22(11):2032-2044. doi: 10.1111/dom.14120.

In 2021

5. van de Velde NM, Hooijmans MT, **Sardjoe Mishre ASD**, Keene KR, Koeks Z, Veeger TTJ, Alleman I, van Zwet EW, Beenakker JM, Verschuuren JJGM, Kan HE, Niks EH. Selection Approach to Identify the Optimal Biomarker Using Quantitative Muscle MRI and Functional Assessments in Becker Muscular Dystrophy. *Neurology*. 2021 Aug 3;97(5):e513-e522. doi: 10.1212/WNL.0000000000012233.

6. Naarding KJ, Keene KR, **Sardjoe Mishre ASD**, Veeger TTJ, van de Velde NM, Prins AJ, Burakiewicz J, Verschuuren JJGM, van der Holst M, Niks EH, Kan HE. Preserved thenar

muscles in non-ambulant Duchenne muscular dystrophy patients. *Journal of Cachexia, Sarcopenia and Muscle*. 2021 Jun;12(3):694-703. doi: 10.1002/jcsm.12711.

In 2022

7. **Sardjoe Mishre ASD**, Martinez-Tellez B, Acosta FM, Sanchez-Delgado G, Straat ME, Webb AG, Kan HE, Rensen PCN, Ruiz JR. Association of shivering threshold time with body composition and brown adipose tissue in young adults. *Journal of Thermal Biology*. 2022 Aug;108:103277. doi: 10.1016/j.jtherbio.2022.103277.

8. Straat ME, Martinez-Tellez B, **Sardjoe Mishre ASD**, Verkleij MMA, Kemmeren M, Pelsma ICM, Alcantara JMA, Mendez-Gutierrez A, Kooijman S, Boon MR, Rensen PCN. Cold-Induced Thermogenesis Shows a Diurnal Variation That Unfolds Differently in Males and Females. *The Journal of Clinical Endocrinology and Metabolism*. 2022 May 17;107(6):1626-1635. doi: 10.1210/clinem/dgac094.

9. **Sardjoe Mishre ASD**, Straat ME, Martinez-Tellez B, Mendez Gutierrez A, Kooijman S, Boon MR, Dzyubachyk O, Webb A, Rensen PCN, Kan HE. The Infrared Thermography Toolbox: An Open-access Semi-automated Segmentation Tool for Extracting Skin Temperatures in the Thoracic Region including Supraclavicular Brown Adipose Tissue. *Journal of Medical Systems*. 2022 Nov 2;46(12):89. doi: 10.1007/s10916-022-01871-7.

7.4 CURRICULUM VITAE

Aashley Siromeni Devi Sardjoe Mishre was born on the 2nd of February 1995, and grew up in The Hague, the Netherlands. After graduating from Lyceum Ypenburg in the Hague in 2013, she continued with the bachelor medical natural sciences at the Vrije Universiteit van Amsterdam. After obtaining her bachelor's degree, she studied the research master medical natural sciences and she chose the medical physics track. As part of her master, she followed internships at the VU medical center and Philips. After finishing her master in July 2018, Aashley started her PhD training at the Leiden University Medical Center at the department of Radiology and the division of Endocrinology at the department of Medicine. During her PhD project, she focused on improving the methodology for studying supraclavicular brown adipose tissue (BAT) activity in human adults. Her findings provided further insight into the role of BAT and body composition during cold exposure in human adults, as well as the development of non-invasive methods to improve the reliability of supraclavicular BAT assessments.

7.4 CURRICULUM VITAE

Aashley Siromeni Devi Sardjoe Mishre was born on the 2nd of February 1995, and grew up in The Hague, the Netherlands. After graduating from Lyceum Ypenburg in the Hague in 2013, she continued with the bachelor medical natural sciences at the Vrije Universiteit van Amsterdam. After obtaining her bachelor's degree, she studied the research master medical natural sciences and she chose the medical physics track. As part of her master, she followed internships at the VU medical center and Phillips. After finishing her master in July 2018, Aashley started her PhD training at the Leiden University Medical Center at the department of Radiology and the division of Endocrinology at the department of Medicine. During her PhD project, she focused on improving the methodology for studying supraclavicular brown adipose tissue (BAT) activity in human adults. Her findings provided further insight into the role of BAT and body composition during cold exposure in human adults, as well as the development of non-invasive methods to improve the reliability of supraclavicular BAT assessments.

7.5 DANKWOORD

Graag wil ik iedereen bedanken die heeft meegewerkt aan dit proefschrift. Ik ben erg dankbaar voor de fijne samenwerking binnen de afdeling Radiologie en de sectie Endocrinologie van de afdeling Interne Geneeskunde. Ik wil alle proefpersonen bedanken voor hun deelname aan de studies. Zonder hun deelname waren de studies in dit proefschrift niet mogelijk geweest. Ik wil mijn copromotor Hermien Kan en promotoren Andrew Webb en Patrick Rensen bedanken voor de begeleiding, ondersteuning en ervaring die ik heb opgedaan tijdens mijn PhD traject. Ik wil graag al mijn collega's bedanken voor de leuke en gezellige tijd in het LUMC alsmede de wetenschappelijke ondersteuning. Tenslotte wil ik mijn ouders (Premood & Sandra), mijn zus en zwager (Maresha & Satiesh), mijn nichtje en neefje (Soedharseni & Avinesh) en mijn man Wiresh, bedanken voor de steun, motivatie en liefde.