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## Proteomic profiling of plasma and tissue proteins associated to mammographic breast density using the Karma cohort

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Following age, mammographic density (MD) is considered one of the strongest risk factors for breast cancer. Despite the association between MD and breast cancer risk, little is known about the underlying histology and biological basis of breast density. To better understand the mechanisms behind MD we conducted large-scale proteomic analyses of blood plasma using two sample sets comprising 729 and 600 women, and assessed morphology, proliferation and hormone receptor status through immunohistochemical staining in breast tissues from 160 women. Plasma and tissue protein expressions and morphology was assessed in relation to absolute area-based breast density. All samples were collected from non-diseased women as part of the KARMA (Karolinska mammography project for risk prediction for breast cancer) project. The KARMA study is a population-based prospective cohort with the overarching goal to reduce the incidence and mortality of breast cancer by focusing on individualized prevention and screening. Plasma profiling revealed 20 proteins with linear associations to MD. These proteins have previously been described in processes of tissue homeostasis, DNA repair, cancer development and/or progression in MD. In breast tissue, high MD was associated with higher amount of stroma and epithelium and less amount of fat, but was not associated with a change in epithelial proliferation or receptor status. Increased expression of both epithelial progesterone receptors and stromal oestrogen receptors was associated with a greater proportion of stroma, suggesting hormonal involvement in regulating breast tissue composition. Our current data is indicative of the mechanistic processes underlying MD and provide insights into the aetiology of MD as a prominent risk factor for breast cancer.

### Biography

Marika Gabrielson has completed her PhD in experimental breast cancer studies in 2013 from the University of Örebro, Sweden, and is currently conducting Postdoctoral studies at Karolinska Institutet in Stockholm, Sweden. She is part of the KARMA study scientific board. She is also Project Manager of tissue collection and experimental work with the overarching goal to identify protein and hormone markers of mammographic density and breast cancer risk.

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