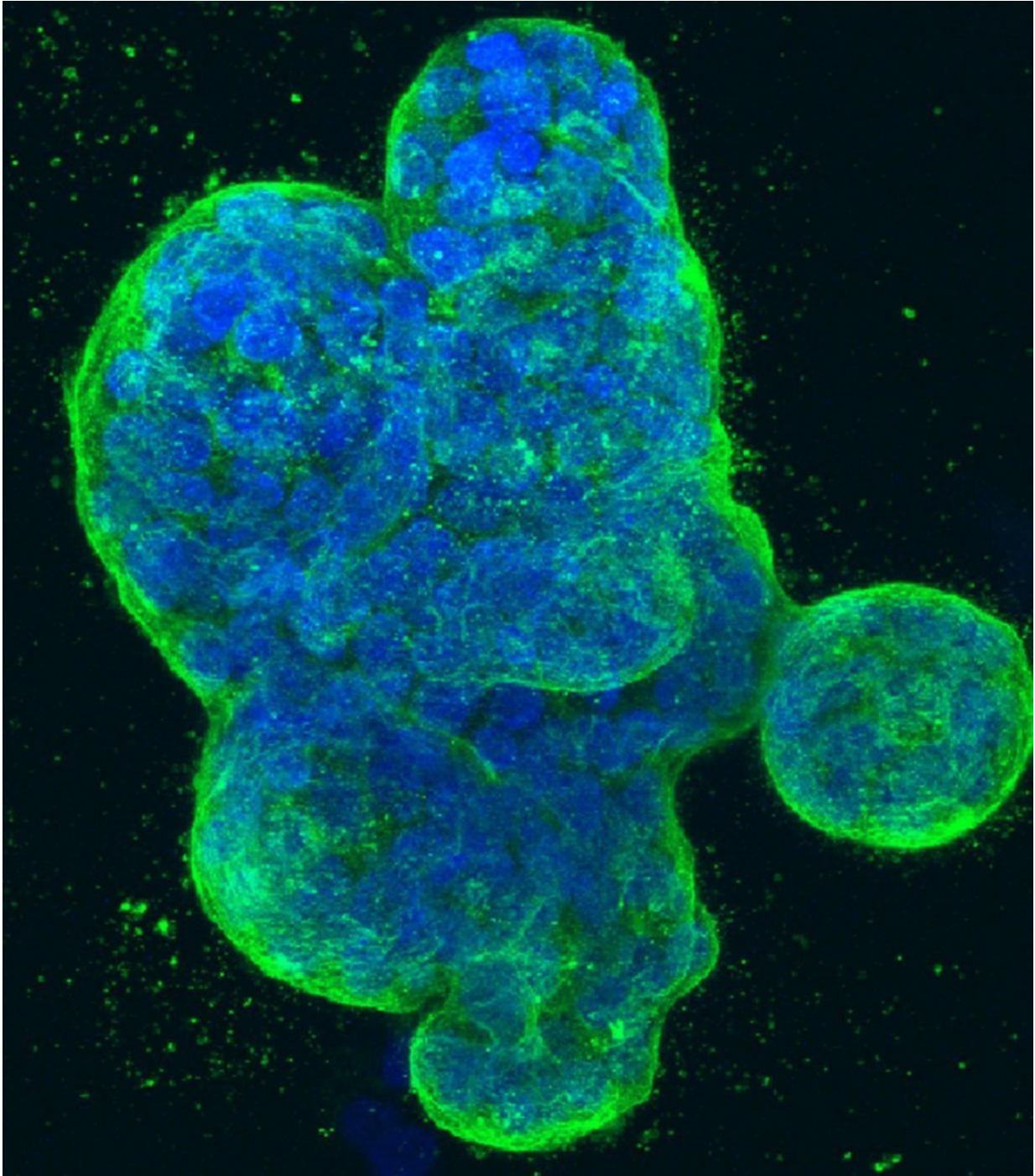


Women who are 'larks' have a lower risk of developing breast cancer

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Three-dimensional culture of human breast cancer cells, with DNA stained blue and a protein in the cell surface membrane stained green. Image created in 2014 by Tom Misteli, Ph.D., and Karen Meaburn, Ph.D. at the NIH IRP.

Women who are "larks", functioning better at the beginning of the day than the end of the day, have a lower risk of breast cancer, according to new research presented at the 2018 NCRI Cancer Conference today.

The study of several hundred thousand women, which was investigating whether the way people sleep can contribute to the development of breast [cancer](#), also found some evidence for a causal link between sleeping for longer and breast cancer.

Dr. Rebecca Richmond, a research fellow in the Cancer Research UK Integrative Cancer Epidemiology Programme and the MRC Integrative Epidemiology Unit at the University of Bristol, UK, and colleagues looked at data from 180,215 women enrolled with the UK Biobank project, and 228,951 women who had been part of a genome-wide association study of breast cancer conducted by the international Breast Cancer Association Consortium (BCAC), which has the largest collection of genetic data on women with breast cancer obtained so far.

"Using genetic variants associated with people's preference for morning or evening, sleep duration and insomnia, which had previously been identified by three recent UK Biobank genome-wide association studies, we investigated whether these sleep traits have a causal contribution to the risk of developing breast cancer," she said.

The team used a method called 'Mendelian randomisation', which uses genetic variants associated with possible [risk factors](#), such as sleep characteristics, to investigate whether they are involved in causing diseases such as breast cancer.

The Mendelian randomisation analysis, which included data from BCAC of 122,977 cases of breast cancer and 105,974 women without the disease (the controls), found that a preference for mornings reduced the risk of breast cancer by 40% compared with being an evening type (an

'owl'). It also found that women who slept longer than the recommended seven to eight hours had a 20% increased risk of the disease per additional hour slept.

Analysis of data obtained from the UK Biobank women (2,740 new cases of breast cancer and 149,064 controls), found similar results; morning preference reduced the risk of breast cancer by 48%. Mendelian randomisation analysis of these data revealed that approximately one less person per 100 will develop breast cancer if they have a morning preference compared to people who have an evening preference. There was less evidence of an association with either insomnia or sleep duration on risk of breast cancer in this study.

Dr. Richmond said: "We would like to do further work to investigate the mechanisms underpinning these results, as the estimates obtained are based on questions related to morning or evening preference rather than actually whether people get up earlier or later in the day. In other words, it may not be the case that changing your habits changes your risk of breast cancer; it may be more complex than that.

"However, the findings of a protective effect of morning preference on [breast cancer risk](#) in our study are consistent with previous research highlighting a role for night shift work and exposure to 'light-at-night' as risk factors for breast cancer.

"We also found some evidence for a causal effect of increased [sleep duration](#) and sleep fragmentation on breast cancer, assessed using objective measurements of sleep obtained from movement monitors worn by around 85,000 UK Biobank participants.

"The method of Mendelian randomisation applied in this research is particularly useful at identifying causal risk factors for disease since the genetic variants identified in relation to the sleep traits are not likely to

be influenced by any external or environmental factors, nor by the development of cancer, and can therefore be used to determine cause and effect relationships."

The researchers believe their findings have implications for policy-makers and employers. Dr. Richmond said: "These findings have potential policy implications for influencing sleep habits of the general population in order to improve health and reduce risk of breast cancer among women."

Dr. Richmond and her colleagues are planning to investigate the mechanisms underlying the effects of different sleep characteristics on the risk of developing breast cancer. "We would like to use genetic data from large populations to further understand how disrupting the body's natural body clock can contribute to breast cancer risk," she said.

Ms Cliona Clare Kirwan, from the University of Manchester, who is a member of the NCRI Breast Clinical Studies Group and who was not involved in this research, said: "These are interesting findings that provide further evidence of how our body clock and our natural sleep preference is implicated in the onset of breast cancer.

"We know already that night shift work is associated with worse mental and physical health. This study provides further evidence to suggest disrupted sleep patterns may have a role in cancer development. The use of Mendelian randomisation in this study enables the researchers to examine the causal effect on [breast cancer](#) of different sleep patterns by looking at the variations in particular genes already known to be associated with sleep characteristics. This helps to avoid misleading conclusions that could have been affected by confounding factors."

More information: Abstract no: Poster 1822. "Investigating causal relationships between sleep characteristics and risk of breast cancer: a

Mendelian randomization study". Silent theatre 2, Tuesday 6 November.
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