

Rembrandt's Bathsheba did not have breast cancer after all: Scientists cast new light on famous painting

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In 1654, Rembrandt van Rijn painted his famous Bathsheba, which depicts King David's wife naked at her bath. The painting has been regarded as an icon for breast cancer since the 1980s, after two Australian surgeons had interpreted the blue mark on her breast as breast cancer and wrote an article about it. Now, with the help of computer simulations, researchers from the MIRA research institute at the University of Twente have demonstrated that it is 'highly unlikely' that the blue mark on Bathsheba's breast really was caused by the disease. Not that the information is really of any use to the patient: she died several centuries ago. The results of the research are published in the *Journal of Biophotonics*.

The model posing as the bathing Bathsheba is very probably Hendrickje Stoffels, Rembrandt's lover. A notable aspect of the painting is that the underside of her breast is blue, and that a swelling can be seen under her left armpit. Two Australian surgeons concluded from this that the woman who modelled for the portrait was almost certainly suffering from breast cancer. Since then, the painting has become a well-known symbol of the disease.

Computer simulation

Scientists at the University of Twente working on the properties of [human tissue](#) wanted to know whether indeed it was possible for a tumour to be responsible for the colour of the breast. They simulated millions of photons ('[light particles](#)') with different wavelengths, which were fired onto a breast with a tumour. They then looked at how many photons came back, and what colour the human brain would assign to the returning light.

Highly unlikely

It appeared from the simulations – after the computer had spent 700 hours doing the calculations – that blue colouring of this kind could only be caused by [breast cancer](#) if the tumour were located one to three millimetres under the skin. In practice, breast [cancer tumours](#) are located much deeper, and deeper tumours do not show any colour. The researchers from the University of Twente therefore concluded that it was 'highly unlikely' that the colour was caused by a [tumour](#) in the breast. For Bathsheba and Hendrickje Stoffels of course, it is all purely academic. Both have been dead for centuries.

Ongoing research

According to Srirang Manohar of the Biomedical Photonic Imaging department of the MIRA research institute, this research project was initially driven by curiosity, although it is also very relevant to another research project currently underway in the department. This project, under the leadership of Professor Wiendelt Steenbergen, is conducting research into, and developing techniques for, the medical application of light for the purpose of detecting cancer, among other things. Manohar states that the painting research project will enable them understand complex light-tissue interactions that form the basis of optical applications in biology and health.

The article, by Michelle Heijblom et al, is titled 'Monte Carlo simulations shed light on Bathsheba's suspect breast'.

Provided by University of Twente

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