

# A breast cancer tumor consisted of a spore-sac fungus (Ascomycotina)

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## Abstract

**Introduction:** Is cancer caused by cell degeneration or may it be that tumor formation in such cases may depend on various forms of plant infestation (e.g. mycoses)? My previous research and its findings have shown that microbiological growth occurs in the calluses that occur in tissues associated with cancer diseases. Other researchers have also observed non-human growth in cancer samples, but they have assumed that the samples must have been contaminated. **Materials and method:** At the Department of Pathology at the Sahlgrenska University Hospital in Gothenburg a hard lump in one of a female patient's breasts was discovered. The diagnosis breast cancer was determined and the breast was removed surgically. The tumor found during surgery was divided into six samples that were prepared for microscopy. **Results:** The microscopy revealed structures in the samples that were consistent with identical structures found in spore-sac fungi. The probability that the structures found in this study would not be parts of a spore-sac fungus is miniscule. **Conclusion:** The morphological structures in the samples in this study are fully consistent with the characteristic features of the spore-sac fungus division. The depicted findings thus show that cancer can be fungal growth. It is therefore necessary to widen cancer research and the paradigm it is based upon and involve mycologists in it.

Keywords: Cancer; Breast cancer; Fungi; Fungus; Fungal growth; Ascomycotina; Mycology

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## 1. Introduction

Is cancer caused by one, for various reasons, disrupted cellular machinery of a previously healthy cell which thereby has increased its proliferation rate and thus has the ability to cause growth (tumor formation) in a tissue, or may it be that tumor formation in such states of the disease may depend on various forms of plant infestation (e.g. mycoses), which suddenly takes hold and begins to grow in a tissue and brings along changes of and in it?

I have for special reasons been given further causes to investigate whether it would be possible to relate to the latter way. My previous research and its findings have clearly shown that microbiological growth occurs in the calluses that occur in tissues associated with cancer diseases<sup>1,2</sup>. Other researchers have also observed non-human growth in cancer samples, but they have assumed that the samples must have been contaminated.

## 2. Materials and Method

A female patient discovered a hard lump in one of her breasts. At the Sahlgrenska University Hospital in Gothenburg the diagnosis breast cancer was determined and quite soon thereafter the breast was surgically removed and chemotherapy was started. In connection with the operation I managed to get six cancer samples that had been prepared at the Department of Pathology, at the Sahlgrenska University Hospital. The samples showed how this cancer appeared morphologically. I could immediately see that the samples consisted of a spore-sac fungus that grew in the sample which as a whole appeared to consist of such a fungus<sup>3</sup>.

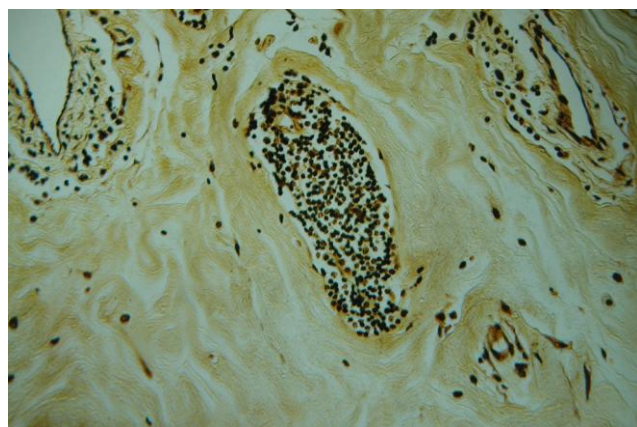
The microscope used in the study was an Olympus Inverted System Microscope IX70, equipped with a 100 Watt halogen lamp. The microscopy was performed in light field and interference contrast. The pictures were taken with a Nikon Coolpix 990 digital camera.

Later on, the samples were demonstrated at Radiumhemmet at the Karolinska University Hospital in Solna/Stockholm where Professor Lindskog argued that what was seen in the sample were cancer cells. However he suggested a contact with a mycologist for further analysis and judgment of the samples. Such an examination and analysis was then carried through at the Department of Biological and Environmental Sciences at the University of Gothenburg. There, the staff have experience from studying different forms of fungal growth. The researchers at this botanical institute judged that the samples in its entirety could be composed of a spore-sac fungus.

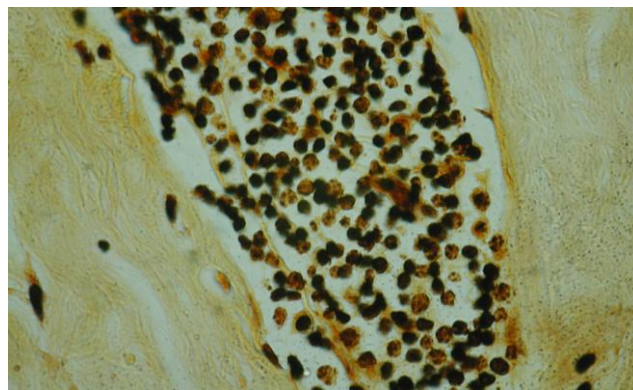
### 3. Results

For those who don't know anything about and do not have any experience of mycology, it is almost impossible to understand how anyone can argue that a tumor tissue – as in this case – can consist of a spore-sac fungus. To get the idea that it could be that way, it is necessary to be able to know the way of development of the spores of such fungi. Since this was familiar to me, I found during the microscopy of the cancer samples that the morphological structure and the architecture of the samples in all probability showed that the samples contained something that could be a form of spore-sac containers with spore-sacs, which is typical for medically important spore-sac fungi<sup>4,5</sup>.

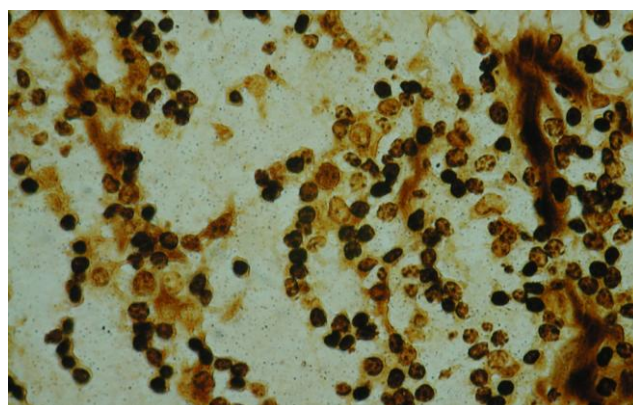
The morphological structures and architecture of the samples presented in this article are displayed in the five following figures.



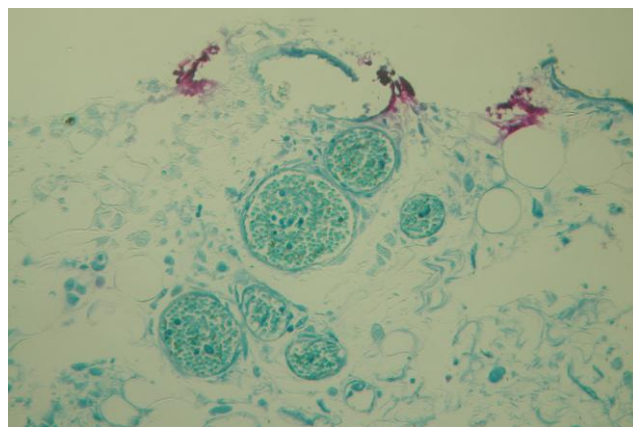
**Figure 1.** 100x magnification. Dyeing: Warthin-Starry. The picture shows a section of a container in pristine condition, lying in the solid tumor tissue (in mycology called an ascocarp, in the shape of a cleistothecium – a ball-shaped container), such a container can contain millions of small, circular structures.



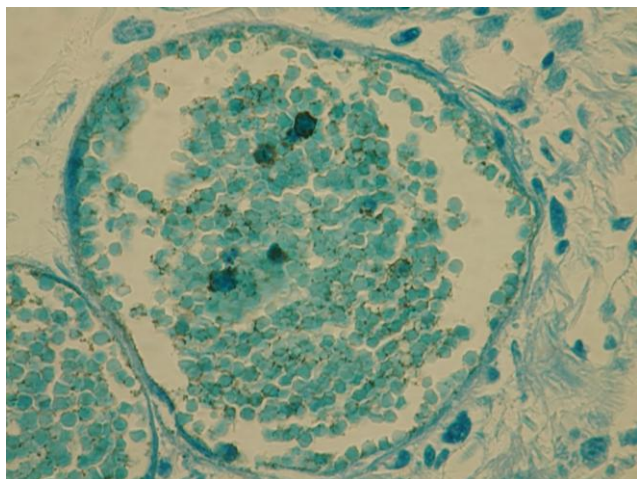
**Figure 2.** 1200x magnification. Dyeing: Warthin-Starry. The same container as in Figure 1 is depicted in Figure 2. There is a number of small particles visible in some of the round structures in this container. To the right, at the bottom of the picture, seeding of detached, somewhat smaller particles is seen in the tumor tissue that is surrounding the container.



**Figure 3.** 1200x magnification. Dyeing: Warthin-Starry. Detached small, round structures are displayed. Small particles are visible in several of these circular structures. Seeding of similar particles are visible in the surrounding tumor substance, outside the exposed structures.



**Figure 4.** 100x magnification. Dyeing: Fites. A section through six clearly visible, separated containers resting in the surrounding tumor substance and containing myriads of similar, small, round structures such as those displayed in Figure 1.



**Figure 5.** 1200x magnification. Dyeing: Fites. A section through a container. A container in pristine condition contains myriads of small structures. In several of these are seen – as in Figure 2 and 3 – small particles, which here seem to be about to leave the small, round structures.

#### 4. Discussion

The tumor morphology in the figures 1, 2, 3, 4 and 5, is displaying all the characteristics of the medical spore-sac fungi. Analogously to how such fungi are described in the mycological literature, the above described containers with small, round structures look just like ascocarps, formed as cleistothecia (ball-shaped spore-sac containers). The small, round structures in the ascocarps look like spore-sacs (asci) and the small particles in the asci, in their turn, look like spores. In Figure 3 the small spore-sacs are seen, freely lying in the tumor substance, which is another unique feature of spore-sac fungi. Overall, this should be the last stage in the process of development of spores in a spore-sac fungus. The spores that seem to leave the spore-sacs (see Figure 2, 3 and 5) and which also occur in the surrounding tissue of the ascocarps, may be spores that have spread from the spore-sacs out to the surrounding tissue.

The signs described in this article that a tumor tissue could be the result of a growing spore-sac fungus mean that the tumor substance in such cases would host ascocarps which, so to speak, are held in place by the tumor substance itself. To understand it all a little better, it can be compared to the way how a nuclear house (core) in an apple is held in place by the surrounding fruit substance.

The spores have a single set of chromosomes and also have the ability to create mycelia containing nuclei of either female or male sex. Therefore a

mycelium can fertilize another mycelium, which occurs when a male mycelium creates a connection (a small bridge) to a female mycelium. Through this connection a nucleus migrates from a cell in the male mycelium over to the female mycelium to fuse with the nucleus of one of its cells. This is an example of such a sexual reproduction that occurs in spore-sac fungi. Such a type of fusion is followed by a number of divisions of the new nucleus. The division process leads to eight new nuclei formed from the original nucleus and represents the number of particles or spores that are finally to be found in the spore-sacs <sup>6</sup>.

The substance that contains all ascocarps is formed by the spore-sac fungus itself and the substance consists of a vegetative tissue material that in the sick patient's tissues is causing calluses – tumors – containing all spore-sac containers (Figure 4). Overall, this can be said to be the fruiting body of the spore-sac producing fungus. The fruiting body grows slowly into itself and can in time be palpated as a resistance in the tissue. This is reminiscent of how a truffle mushroom grows in the form of clods below the soil surface. In this context it should be of interest as the truffle mushroom also is a spore-sac fungus.

It has not been possible to find the associated mycelia to such a spore-sac fungus but doing so is not necessary in order to be able to definitively confirm that what was found in this patient and diagnosed as cancer growth was actually a spore-sac fungus.

#### 5. Conclusion

What, in this case by routine, was classified and described as cancer can very well be mycoses, which does not seem to be known by the publicly funded healthcare.

The probability that the, in this scientific article, depicted structures do not constitute a spore-sac fungus is extremely small. The morphological structures in the samples in this study are fully in accordance with the characteristic features of spore-sac fungi. The depicted findings thus show that cancer tumors very well can be fungal growth, a statement also supported by the obvious smell of decay that large tumors bring along. Therefore, health care staff and medical researchers must be open-minded about the possibility that cancer may very well consist of fungi. Thus there is reason to involve mycologists in cancer research.

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