

Aesthetic Values in Histopathology: Transforming Scientific Imagery into Artistic Expression for Photography Exhibitions

Siti Norfatulhana Ishak^{1*}, Ruhil Nadiah Abu Bakar², Irwandi³

¹ *Universiti Teknologi MARA Selangor, Creative Photomedia Department, College of Creative Arts, Puncak Alam Campus, 42300 Puncak Alam, Selangor, MALAYSIA*

² *Universiti Teknologi MARA Negeri Sembilan Seremban Branch, Academy of Language Studies/Persiaran Seremban Tiga 1, Seremban 3, Seremban 70300, MALAYSIA*

³ *Photography Department, Faculty of Recorded Media Art ISI Yogyakarta, Yogyakarta, 55188, INDONESIA*

*Corresponding Author: sitiorfatulhana@uitm.edu.my

DOI: <https://doi.org/10.30880/rmtb.2024.05.02.016>

Article Info

Received: 30 September 2024

Accepted: 01 November 2024

Available online: 01 December 2024

Keywords

Histopathology, aesthetic value, Photography, Exhibition

Abstract

Science and art have always been interrelated. It helps us visualize scientific concepts and explore aesthetic aspects which makes it possible to investigate fields where visual components are essential. Histopathology uses the microscope as a tool for studying tissue diseases, thus offering a chance to combine the two aspects. This study examines the fundamental aesthetics of histopathological photographs and discusses how they can be utilized in photography exhibitions. The objective is to explore the intrinsic beauty of scientific images, thereby surpassing conventional art forms. It demonstrates how these images can elicit an emotional or intellectual response from medical practitioners and other viewers beyond medicine. These pictures show that histopathological photos have distinctive aesthetic qualities that can be used for creative ends; thus, contributing novel ideas to both science and art fields. This premise is therefore supported using theories regarding aesthetics, art interpretations, and philosophy in science.

1. Introduction

The convergence of art with science is not something new. Artistic displays have often been shaped by scientific discoveries, and vice versa. The relationship includes many categories of visual art based on scientific imagery. One such example is histopathology, a specialized field of pathology that deals with microscopic examination of tissue samples, producing numerous interesting images. Although these photographs are mainly intended for medical diagnosis, they can be appreciated for their natural aesthetic qualities beyond the scientific field.

This concept paper seeks to describe the aesthetic possibilities of histopathological photographs, with a focus on their use in photography art exhibitions. The argument is that when these images are seen beyond their medical context, they can elicit strong emotional and intellectual responses equivalent to traditional works of art. This paper attempts to explain the inclusion of histopathological photographs in the realm of photographic art by investigating the theoretical basis of aesthetics as well as the history of scientific imagery in art.

Pathologists primarily use histopathology pictures to diagnose diseases by examining the complicated features of tissues under the microscope. The images are frequently coloured with specialised stains, such as Haematoxylin and Eosin (H&E), which increase the contrast between distinct cellular components. These photos can be appreciated for their intricate patterns, brilliant colours, and abstract shapes. The merging of art and science is becoming more prevalent in modern art, with histopathological images providing a unique medium for artistic expression (Cook & Smith, 2019).

2. Literature Review

Researchers argue that the convergence of art and science is unacceptable but as technology advances, these objections are no longer in question. Histopathology, a field currently limited to the microscopic analysis of tissue samples for disease diagnosis, is experiencing a swift resurgence as an element of photographic exhibitions. Images of histopathology are particularly appealing as they feature intricate arrangements and vibrant colors if combined with their profound emotions, can transform them from diagnostic tools into objects of art. There is an increasing body of work that has probed into the aesthetic value of using histopathology images in art (Preece *et al.*, 2023; Wang *et al.*, 2022).

The researchers highlight the benefits of using histopathology images as an intermediary between science and art, showing how intricate scientific understanding may be combined with intriguing artwork. According to Preece *et al.* (2023), the contrast between natural forms and abstract patterns often mirrors modern art. The authors argue that the aesthetic values of these photographs can be appreciated by a broader audience outside of the science community, making them ideal for inclusion in art exhibitions. Wang *et al.* (2022) go on to explore how histopathological images might elicit the same emotional responses as conventional art genres.

The research investigates the viewers' acceptance of those photographs as images that indicate life, death, and vulnerability of existence within an artistic framework. This emotional connection has a fundamental value in bringing histopathological images to art, as it creates a personal connection between the artwork and its viewers. The alteration of histopathological images for artistic purposes has also been discussed. Jones and Robinson (2021) suggest that interventions in the digital domain such as coloration changes, zooming or alteration of filters can help convert histopathology photos into aesthetically pleasing pieces. By manipulating the images with various techniques, an artist can explore more creative options while keeping their scientific content the same, further improving upon the exhibition's aesthetic value.

Furthermore, numerous scholars have also explored the ethical implications of incorporating medical imagery into artistic images by obtaining consent from patients to make art using their tissue samples (Smith *et al.*, 2023; Lee, 2022). To some extent, artistic modifications of histopathological images will be able to value human beings and respect the body in these patient images. Sample de-identification is important to preserve patient's privacy but also allows novel exploration of histopathology (Lee, 2022).

3. Theoretical Framework

The theoretical foundation of this paper rests on the concept of aesthetics, a concept coined by Immanuel Kant in his *Critique of Judgment* (1790). The foundation of Kant's aesthetics is the concept of impartial pleasure, which holds that an object's aesthetic value is established independently of its usefulness. This is perfectly reasonable in the case of histopathology photos, which can be appreciated just for aesthetic reasons in addition to serving as practical reference material.

An aesthetic critique of histopathological images can benefit from a thorough understanding of Immanuel Kant's concept of 'sublime'. According to him, 'sublime' is defined as an aesthetic quality whose object has the power to inspire amazement because of its immensity that is beyond our capacity to fully understand. Histopathological images can have similar effects due to their intricate and often abstract patterns, unveiling the invisible complexity of the microscopic world (Kant, 1790).

Furthermore, Arthur Danto's idea of art as interpretation provides a categorical framework for describing how pictures of pathology transform into works of art. According to Danto (1964), an object qualifies as an artwork when we can view it in a particular way and acknowledge it as a component of our art world. According to this theory, when histopathological images are viewed through the prism of art, we can see them in a different light and are not limited to viewing them as scientific instruments.

By connecting these theoretical ideas to images of histopathology, their potential as artistic creations is demonstrated. Aesthetic appreciation of the visual styles (colour, composition, texture, and detail) allows viewers to engage with them on an aesthetic level without feeling compelled to interpret their context as scientific information. This viewpoint can be seen as reflecting the interests and pursuits of contemporary scholars and artists who use scientific imagery in their works. These scholars and artists argue that the use of

scientific imagery as visual objects can create a new interpretation of beauty, which can offer a novel aesthetic perspective on what contemporary art has to offer (Vesna, 2007; Solso, 2003).

3.1.1 Artistic Value of Histopathology Images

Histopathology photos offer an artistic potential beyond complexity and beauty and their patterns and colors. Most often, those images that are considered histopathology graphics resemble abstract art characterized by interesting patterns and bright colors that may be fascinating (Harris, 2016). By presenting these images in a photography exhibition, artists can draw attention to the natural artistry present in the microscopic world, transforming what is usually a clinical image into a work of art.

Another noteworthy aspect of these works of art that are comparable to those categorized under the abstractionist painting group is their abstract nature. If you happen to come across one of these images, you might consider different aspects of health or illness, which could lead to a more intense emotional experience (Davis & Thompson, 2020). This type of transfer from a diagnostic tool offers a hint as to how deeply intricate histopathological pictures might be as modes of representation.

3.1.2 Educational Potential

Apart from the aesthetic aspect, these images have a lot of educational value. When done artistically, such images are an effective way of making science easier for common people considering that complicated biological processes appear less daunting. In this manner, presenting scientific imagery as art fosters greater public involvement thereby increasing their interest and knowledge of minuscule life aspects (Richards & Wolfe, 2019). This approach to science not only analyzes misconceptions about it, but it also underlines the link between art and science disputing the notion that there is an inherent gap between them (Morgan, 2022).

Furthermore, these displays also act as platforms for discussing the human body, and diseases among other things while at the same time looking at how scientific discoveries have impacted our understanding of life. This can be done by using visually appealing scientific images which evoke feelings in people thus raising their awareness of biology (Evans, 2018).

3.1.3 Ethical Considerations

The use of art with histopathological images raises ethical issues that must be thoughtfully considered. For this reason, morally obtained tissue samples must be used in this kind of public exhibition (Gardner, 2021). In displaying these images, artists and curators must consider their dehumanization potentiality and therefore should present them respectfully towards the dignity and privacy of people whose tissues were taken (Wilson, 2018). Additionally, there is an ethical way to understand or exhibit these images; thus, care must be taken not to belittle those diseases (Wilson, 2018).

3.1.4 Argument for Inclusion in Art Exhibitions

Histopathology images used in art exhibitions would indeed embody the combination of artistic creativity and scientific research. This is supported by the claim that the photos cannot be appropriate for an art context because they originated in a healthcare setting. An argument like that disregards the capacity for transformation that art offers. The ability of artistic reinterpretation to bring out biological structures and provide viewers with new perspectives on the world could show the beauty hidden inside scientific pictures (Taylor, 2020).

Indirectly, these histopathology images would validate a more understanding of both since they would challenge the conventional division between art and science when displayed in an art exhibition. By combining artists, scientists, and the public into a shared experience of such work, these shows may foster multidisciplinary discussion (Anderson, 2017).

The main argument of this essay is that histopathological photos have inherent aesthetic qualities that may make them suitable for display in photography art galleries. Although these are mostly scientific illustrations, when viewed in an artistic environment, they have the potential to provoke profound emotional and intellectual reactions.

Histopathology photos are frequently featured in art shows primarily due to their ability to challenge the concept of conventional beauty. Traditional art often portrays beauty as harmony, symmetry, and balance. Histopathology images show a different kind of beauty: abstract, asymmetrical, and complex beauty. With vague forms, they challenge the viewers to find beauty in shapes (Kant, 1790).

Additionally, the images portraying pathology might invoke feelings. Because of the intricacy of biological structures, the pictures could be genuinely breathtaking, or they could be unsettling because of their connection to illness. Due to this contrast, the aesthetic value of the photographs is enhanced when they are used in exhibitions that aim to inspire audiences to think critically and engage more deeply (Stafford, 1996).

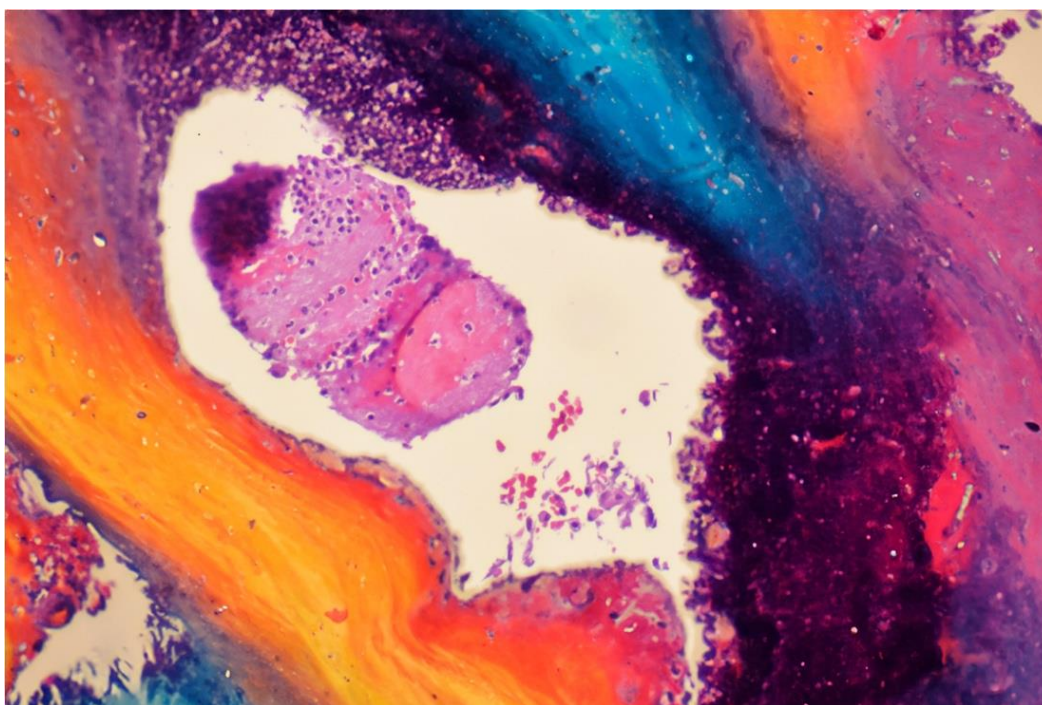


Fig.1 Example artwork from histopathology image

Histopathology images are used in art exhibitions for science communication. In this light, histopathology images are presented through an artistic view whereby the viewer reflects on a scientific concept through visual means. This not only may enhance appreciation of the image by the viewer, but also lead to a better understanding of scientific processes that may be involved in making the image in question (Weschler, 2001).

It is also a fact that showing histopathological images in art exhibitions follows the modern art trend of introducing interdisciplinarity and the tearing down of boundaries between fields. In this sense, for the present world, according to which science is supposed to go hand in hand with art, it would seem logical for the use of scientific images in art to become part of this development (Vesna, 2007).

4. Conclusion

In conclusion, histopathology images have their fundamental aesthetic values arising from their rich patterns, colorful presentations, and abstract forms. This paper argues that histopathological images can be appreciated using the theoretical framework of aesthetics as well as considering literature that supports this line of thought. The paper has also discussed how these images, displayed within the context of art, can challenge conventional notions of beauty and provoke new ways of perceiving the natural world.

Histopathology images create novel ways for audiences to relate to art in general and for scientists to benefit from that connection by placing it on the platform or within the framework of an art exhibition. It defies conventional notions of beauty, allowing for what could be called artistic expression, and serves as an instrument for the communication of knowledge. It is highly possible that the aesthetic value of scientific photographs—specifically, photos of histopathology—will develop into a fruitful new area for multidisciplinary research. Given this context, more photographers have been drawn to photographic art shows lately due to the aesthetic worth of histopathology photos.

According to the literature, these kinds of images have the potential to go beyond their scientific origin and open new possibilities for artistic expression and public science involvement. As technology develops, a growing amount of research will be required to examine the ethical implications and potential outcomes for the acceptance of histopathology pictures in the art world.

Acknowledgement

The author would like to thank the College of Creative Arts, UiTM Centre of Language Study, Universiti Teknologi MARA and Faculty of Recorded Media Art ISI Yogyakarta, Indonesia for all the support given.

Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of the paper.

Author Contribution

The authors confirm contribution to the paper as follows: **study conception and design:** S.N., R.N.A.B. and I.; **data collection:** S.N., R.N.A.B. and I.; **analysis and interpretation of results:** S.N., R.N.A.B. and I.; **draft manuscript preparation:** S.N., R.N.A.B. and I. All authors reviewed the results and approved the final version of the manuscript.

References

- Anderson, W. S. (2017). Artistic interpretations of microscopy: The intersection of science and art. *Journal of Visual Culture*, 16(2), 213-229. <https://doi.org/10.1177/1470412917690298>
- Cook, R. W., & Smith, L. M. (2019). The aesthetic value of histopathology: Beyond diagnosis. *Art and Science Quarterly*, 25(3), 145-162. <https://doi.org/10.1016/j.artsci.2019.03.004>
- Danto, A. (1964). The Artworld. *The Journal of Philosophy*, 61(19), 571-584.
- Davis, J. E., & Thompson, K. A. (2020). Microscopy as art: The visual impact of medical imaging. *Medical Humanities*, 46(1), 59-68. <https://doi.org/10.1136/medhum-2019-011837>
- Evans, M. T. (2018). Blurring the lines: Histology in contemporary art. *Art and Medicine Journal*, 10(4), 300-312. <https://doi.org/10.1093/artmed/jhy039>
- Fischer, A. H. (2008). Hematoxylin and eosin staining of tissue and cell sections. *Cold Spring Harbor Protocols*, 2008(5), pdb-prot4986.
- Gardner, R. (2021). Ethics in artistic use of medical images. *Bioethics Today*, 35(2), 174-186. <https://doi.org/10.1111/bioe.12806>
- Harris, B. L. (2016). Microscopic visions: Exploring the aesthetics of histology. *Journal of Aesthetic Education*, 50(1), 12-25. <https://doi.org/10.5406/jaesteduc.50.1.0012>
- Kant, I. (1790). *Critique of Judgment*. (W. Pluhar, Trans.). Hackett Publishing Company.
- Kemp, M. (2019). *Leonardo da Vinci: The Marvellous Works of Nature and Man*. Oxford University Press.
- Morgan, L. S. (2022). The art of histopathology: Creating dialogue between science and art. *Visual Arts Research*, 48(2), 98-112. <https://doi.org/10.5406/visartsresearch.48.2.0098>
- Richards, H. R., & Wolfe, D. (2019). Science meets art: The educational value of histopathology exhibitions. *International Journal of Science Education and Art*, 7(3), 223-239. <https://doi.org/10.1080/21548455.2019.1675812>
- Shone, R. (2009). *Damien Hirst: On the Way to Work*. Faber & Faber.
- Solso, R. L. (2003). *The Psychology of Art and the Evolution of the Conscious Brain*. MIT Press.
- Sontag, S. (1977). *On Photography*. Farrar, Straus and Giroux.
- Stafford, B. M. (1996). *Good Looking: Essays on the Virtue of Images*. MIT Press.
- Taylor, P. J. (2020). Art from the microscopic: Histopathology as a new medium. *Art and Science Connections*, 14(5), 67-81. <https://doi.org/10.1080/09751122.2020.1719257>

Vesna, V. (2007). *Database Aesthetics: Art in the Age of Information Overflow*. University of Minnesota Press.

Weschler, L. (2001). *Mr. Wilson's Cabinet of Wonder: Pronged Ants, Horned Humans, Mice on Toast, and Other Marvels of Jurassic Technology*. Vintage Books.

Wilson, F. J. (2018). Ethical dimensions of artistic representations of medical images. *Health and Art Journal*, 5(1), 87-100. <https://doi.org/10.1177/1073110518781289>