



Michaelina Wautier's self-portrait—Iconodiagnostic and hermeneutic analysis of arthritis in a rediscovered Flemish painter

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Iconodiagnosis is a term coined for a medical humanistic approach and refers to the scientific practice of identifying medical conditions by pattern recognition in artistic representations of the human body [1, 2]. The approach is based on a hermeneutic cycle in which medical observations are linked to explanations and in a next step of reasoning to a deep understanding through the inclusion of the historical and sociocultural context [3]. Numerous interrelationships exist between art and rheumatology, as the symptoms of rheumatic diseases were frequently depicted by painters, and many such observations can be found in works of the Flemish school [4, 5]. Michaelina Wautier (1614–1689) was one of the great Flemish painters, although her work has not been sufficiently appreciated over the centuries. New scientific insights into the first of her presumed two self-portraits were recently gained as the result of an exhibition (2025–2026) at the Kunsthistorisches (Historical Art) Museum in Vienna [6].

Her early self-portrait (c. 1650) which is in private ownership and has been loaned to this exhibition, de-

picts the 36-year-old painter at work (Fig. 1). Her right hand shows inflammatory swelling of the metacarpophalangeal joints and the ulnar side of the wrist. The small hyperpigmented spots on her face can be regarded as an indicator of the realistic manner in which she portrayed herself.

Another painting dated for the time between 1655 and 1659 is titled “The Triumph of Bacchus” (Fig. 2) and is part of the collection of the Kunsthistorisches Museum (where it was restored in 1968). Here, a female figure on the right side of the canvas has been interpreted as representing a second self-portrait, in which the artist depicted herself in an idealized manner [7, 8]. In this painting, the visible left hand appears normal (Fig. 2). Bacchus is lying drunken in a cart in the center of the painting and his face shows changes similar to rosacea, a skin disorder which is elicited by or can be worsened by alcohol: this attests to the painter's familiarity with medical conditions as well as to her realistic depiction of the figures in this painting.

The swelling on the (first) self-portrait is consistent with active rheumatoid arthritis (RA). Several differential diagnoses for this arthritic swelling should be considered in light of the historical period and lifestyle of the seventeenth century. The first is psoriatic arthritis, which can resemble RA clinically in many patients; however, no skin or nail abnormalities suggestive of psoriasis can be identified in the self-portrait. Another differential diagnosis would be infectious mimics of RA, most importantly Poncet's disease which would be unlikely to subside, just as RA usually does not spontaneously remit [11]. It is a reactive arthritis due to *Mycobacterium tuberculosis* and can present as symmetric polyarthritis in up to 40% of patients [12]. Furthermore, viral arthritis can be considered but this would have usually resolved rapidly with no residual joint damage, so it would not have been necessary to depict the swollen hand. Acute rheumatic fever and

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Fig. 1 **a** Michaelina Wautier's first self-portrait with swelling of her right hand typical for rheumatoid arthritis. **b** The classical anatomic distribution is ulnar-sided wrist swelling due to tenosynovitis of the extensor carpi ulnaris tendon (arrow), and swelling over her metacarpophalangeal joints, particularly on the third and fourth fingers (arrowheads)

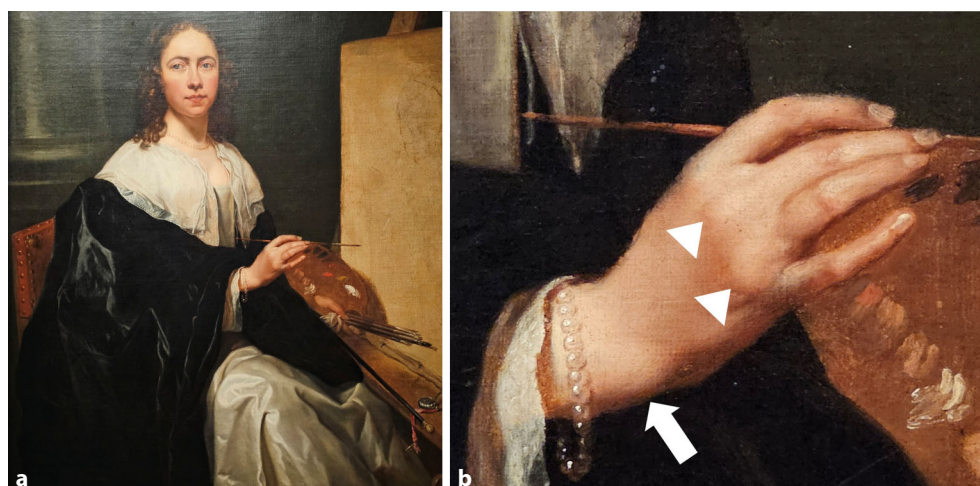


Fig. 2 **a** Second assumed self-portrait of this painter. **b** It shows her left hand appearing normal without inflammatory swelling (enlarged detail, Kunsthistorisches Museum Vienna, Online Collection, nv. Nr. Gemäldegalerie, 3548, reprinted with permission)



post-streptococcal arthritis are also usually transient; while usually affecting the large joints, they can occasionally involve the hands. Finally, arthritis associated with a connective tissue disease, such as systemic lupus erythematosus or myositis would mimic RA but in the painting there are no signs of skin changes typical for any of these diseases.

Another important differential diagnosis is gout, in this context referred to as saturnine gout secondary to chronic lead exposure [13]. In the hands, this would lead to monosodium urate depositions predominantly in the wrist, the tendons, and the interphalangeal joints but there are no signs of tophi which often accompany symmetric polyarthritic presentations of gout and also the typical erythema of gouty joints is missing. Furthermore, gout is uncommon in premenopausal women.

Besides gout, lead exposure can present as osteoarthritis or more commonly as lead neuropathy. None of these abnormalities are visible on the self-portrait, but lead exposure has been associated with activation of the immune and inflammatory system and suggested to be an environmental risk factor for RA [14]. It should be noted that physicians at that

time found it difficult to reliably distinguish between gout and other joint diseases. Although Hippocrates (460–370 BC), with his keen powers of observation, had written aphorisms on gout and distinguished it from other forms of arthritis, this knowledge was lost over time [15]. It was not until 1683 that the English physician Thomas Sydenham (1624–1689), himself afflicted with gout, successfully established this differential diagnosis [16] and it was not until 1800 that RA was first described by Landré-Beauvais [17, 18].

Thus, RA is the most likely diagnosis when looking at Michaelina Wautier's self-portrait. The fact that she apparently stopped painting in 1659 at the age of 45 years might be consistent with the assumption of functional impairment caused by RA. She died in 1689 at the age of 75 years and no information regarding her health status in later life is available [9]. It remains unclear whether RA, a usually painful and potentially disabling systemic disease may have influenced her artistic activity or lifestyle. An additional piece of information could be provided by her handwriting, which does not appear to have been significantly affected, as demonstrated by her signature on a notarial deed dated 1682 [19]. Of note, a review of Wautier's

biography revealed no history of autoimmune disease in her family, nor were any suggestive findings identified in other sources, such as her brother Charles Wautier's possible self-portrait [9, 10].

The symptoms of RA usually present bilaterally and symmetrically, affecting both hands. It is a chronic disease for which in Wautier's days no remedy was available. Spontaneous remission of RA is very rare and over a period of several years one would expect to see not only continued swelling but also significant joint damage, such as malalignment and atrophy of the interosseous muscle of the hand which, indeed, is also already slightly discernible in her self-portrait (Fig. 1).

To explain the discrepancy between the first and the presumed second self-portrait from a medical viewpoint, three possible explanations should be considered. First, the arthritis seen in the first self-portrait is not RA, instead she suffered from another of the abovementioned differential diagnoses. A second option is that Michaelina Wautier idealized her appearance in the Bacchus painting, thereby concealing the swellings of her hands. The depiction of the woman in the painting would be more of a self-representation than a self-portrait; however, this would be in contrast with the realistic painting style of the other figures in her painting, so why should she then be idealizing her own appearance? The third possibility is that the presumed second self-portrait represents a different woman. Not only the lack of hand deformities suggests this latter possibility but also the lack of the facial pigmented spots in the Bacchus-painting, the difference in hair color (brown vs. blond) and the difference in the forehead (high vs. low) would support this assumption. If one, therefore, follows the third option, the riddle is not why Wautier's arthritis is not visible in the second painting but who the woman shown in the Bacchus masterpiece really was? Indeed, in this respect it has been noted that the facial features in the two portraits "show just as many differences as similarities" [20].

A nonmedical perspective requires a broader view and takes into account that differing self-perceptions may also have influenced how the painter depicted her hands [21]. The allegorical nature of such paintings, in which much is conveyed symbolically, should therefore be taken into account. The representation of the woman in the painting "The Triumph of Bacchus" has been classified as a historicising portrait, in which the genres of the individual portrait and history painting are combined [7]. The painter drew inspiration from antique sculptures of bacchantes or Amazons, who were both frequently depicted in Roman art [22]. According to this concept, a self-portrait represents more of a narrative about the artist herself, aimed at conveying a specific message, than a realistic picture [3, 23, 24]. But then again: why are other persons depicted so realistically in this painting?

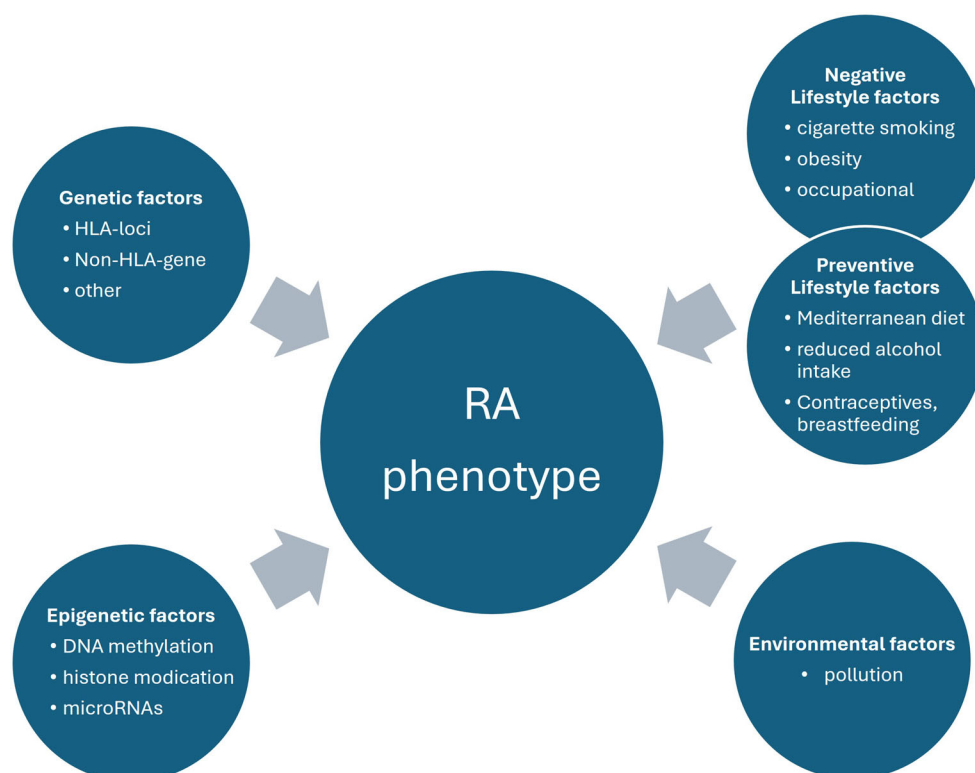
Coming back to the medical perspective, the search for explanations for the swelling in Michaelina Wautier's hand could be supported by a hermeneutic approach. Analyzing the probability of the disease, only few painters from the seventeenth to the twentieth centuries have been suspected of having had RA. Albrecht Dürer, Peter Paul Rubens, Auguste Renoir, and Raoul Dufy are among those in whom this diagnosis has been proposed or established [25]. Compared to the approximate estimate of RA prevalence (which is today in the order of 0.5–1% of the general population), it does not appear to be significantly higher in this occupational group; however, it is remarkable that, with the exception of Niki de St. Phalle, female painters have not been suggested to have suffered from RA even though the prevalence of RA is 2–3-fold higher in women than in men [26, 27].

The cause and pathogenesis of RA is regarded as multifactorial [28]. Aside from genetic predisposition and autoimmune mechanisms, environmental triggers have been suggested. One potential occupational trigger is exposure to toxic substances contained in artists' pigments [29]. Exposure to heavy metals can promote arthritis by altering metallothionein metabolism, damaging mitochondrial DNA, and impairing glutathione synthesis, thereby increasing oxidative stress (Fig. 3; [30]). Some of these metals, including lead, can also increase production of proinflammatory cytokines, such as interleukin 1 (IL-1) and IL-6 as well as the expression and function of inflammatory enzymes such as cyclooxygenases [31].

In recent studies using radiography, X-ray fluorescence analysis, and X-ray spectrometry to analyze the pigments employed by Michaelina Wautier, a wide variety of substances were identified, thereby documenting her exposure to potentially toxic substances [32]. As she also scratched the colors with her fingernails, she had direct skin contact with them [32].

Painting with these vibrant colors enables a high degree of plasticity while maintaining a high level of detail, and this could support the hypothesis why such substances could have contributed to the development of RA in painters. The pigments contained mainly lead white as well as low concentrations of calcium, potassium, iron, manganese, copper, mercury and arsenic [32, 33]. Lead white is a lead carbonate formed by the reaction of lead with acids which has been used in painting since prehistoric times [34]. Painters were increasingly aware of the toxic effects of lead as the term "colica pictorum" (painter's colic) was coined which started to be understood in the seventeenth century by physicians [35]. Recently, lead was shown to be associated with the development of RA according to an environmental study about areas with high air pollution [36]. In a recent study about occupational lead exposure, changes of immunological markers, including circulating cytokine levels and leukocyte counts were demonstrated [37]. In another study, a significant positive correlation between lead,

Fig. 3 Pathogenetic mechanisms of RA (modified after [28])



cadmium and RA outcome was found [38]. Mercury compounds can also induce autoimmune reactions as demonstrated in experimental studies [39]. In a study about toxic element exposure of RA patients in the population of Dublin/Ireland it was shown that the mean values of arsenic, cadmium, mercury, and lead were significantly higher in scalp hair and blood samples of RA patients as compared to healthy controls [40].

Other toxic substances, such as crystalline silica can also be considered but were not found in the chemical analysis of Michaelina Wautier's paintings; however, she and her brother were part of the Brussels artists' network, which also included sculptors; painters used plaster casts as models, and, as Wautier's painting "Young Man Smoking a Pipe" shows, smoking was not uncommon [8, 41]. In view of the general living and working conditions in the cities of that time, environmental factors might have to be taken into account in the development of RA in a similar way as they are today.

The limitation of this analysis lies in the scarcity of information available about this painter and her work [21]. As her arthritic swelling is documented in only one painting, our hypothesis can be classified as a level II ("probable") diagnostic certainty in accordance with the iconodiagnosis guidelines [42]. Another limitation of our approach is that it aims to explain the observation of a swollen hand in a painting as evidence of a specific medical disorder. This can be seen only as one part of a hermeneutic inter-

pretation for understanding the broader artistic and historical context of the paintings.

In conclusion, this iconodiagnostic approach suggests that occupational exposure to toxic pigments could have contributed to the development of rheumatoid arthritis in Michaelina Wautier. This hypothesis is based on the clinical appearance of the arthritic swelling and its differential diagnoses, historical information on the artist's lifestyle and potentially hazardous working conditions and current knowledge of the multifactorial pathogenesis of RA. The observations and explanations of Michaelina Wautier's self-portrait could not only shed some more light on the life of this extraordinary woman but also raise awareness of the potential role of environmental substances in the development of RA.

Data availability All data supporting the findings of this work are included in the article.

Declarations

Conflict of interest F.Kainberger and J.S. Smolen declare that they have no competing interests.

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