



# A Feminist History of Science: Carolyn Merchant and The Death of Nature

Roberto Barbosa<sup>1</sup>   
Iohana Santarelli<sup>2</sup> 

## Abstract

This paper aims to contribute to existing bibliographical references on the history of science in the Brazilian context by presenting a new perspective, an example of historical pluralism. Through a feminist lens, we introduce, in this paper, insights offered by the American historian of science, Carolyn Merchant, in *The Death of Nature: Ecology, Women and the Scientific Revolution*. Despite its limited recognition in Brazilian universities, Merchant's book serves as an exemplary piece of counter-history in science. Thus, we articulate the perspectives of diverse feminist thinkers in the realm of science, delve into their critiques, and expound upon the ideas presented by Carolyn Merchant.

**Keywords:** feminism; History of Science; Counter-History of Science; Herstorian of Science; Gender.

<sup>1</sup>Universidade Federal do Paraná – Setor Litoral, Matinhos, Rua Jaguaíva, 512, (Paraná) Brasil.

Correo electrónico:  
robertobarbosa@ufpr.br

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## Introduction

Feminist studies of science emerged in the early 1980s, driven by a critical examination of the intrinsic relationship between scientific thought and masculinity. The feminist perspective on science consciously and politically challenges the male monopoly that shaped modern science and led to the secular exclusion of women from its history. This monopoly was claimed to be geared towards maintaining objectivity and scientific truth by separating facts from social values in the epistemic sphere; however, it has actually concealed misogynistic views, behaviors, and practices of white European men towards women, spanning from the Enlightenment philosophers to the present day.

In this sense, the history of science from a feminist perspective, considered a counter-history of science by Roberto Barbosa (2020), seeks to unveil overlooked facts and characters, including its authors, that have been erased from the traditional narrative. Counter-histories of science represent critical and counter-hegemonic perspectives on the subject, questioning historical silences and displacements that converge to legitimize an oppressive reality (BARBOSA, 2017; 2020). That being said, this paper aims to present a feminist perspective on the history of science and, through this lens, introduce *Death of Nature: Ecology, Women and the Scientific Revolution* by Carolyn Merchant as a significant example of the author's contribution to the field.

## *Feminism and the History of Science*

Identifying in literature the names of women who have played a role in the history of modern Western science has proven to be a challenging endeavor. In fact, in the 1970s, academic and non-academic movements emerged intending to recover and highlight the contributions of women scientists that had been overlooked or discredited over time.

According to Lourdes Bandeira (2008),

women have been omitted from scientific communities for centuries, that is, from the academic and institutional spaces where science and knowledge are produced, even during the Scientific Revolution of the 17th and 18th centuries. Since that time, there has been a two-faced situation of absence: knowledge producers engaged in scientific institutions who, due to exclusion, have been unable to intervene in contents and notions of scientificity, which thus became markers of the inequality between men and women in the social structure of natural sciences, mathematics, and engineering (BANDEIRA, 2008, p. 214).

The result of said exclusion is the universal association of men with the image of a scientist in the history of modern Western science. Therefore, male names quickly come to mind when discussing the history of modern science and its significant achievements due to this prevailing notion in schools and universities. The scientific field itself is marked by a predominant presence of men.

The exclusion of women from the history of science can be traced back to male hegemony in controlling the narrative throughout history, leading to the dominance of history by men: “Feminists have argued [...] that history is the story of a specific form of domination, namely of patriarchy, literally ‘his-story’” (Linda Smith, 2018, p. 43). Bandeira (2008, p. 209) contends that “the absence of women and the respective silence regarding their presence in history, and, by extension, in the history of the sciences reveal, in the end, the hegemonic association of masculinity and scientific thought”.

In light of these arguments, it is essential to recognize that women’s struggle for admission into the world of science goes beyond the attainment of spaces in laboratories; it encompasses the retrieval of what has been lost or stolen by erasing women from within science. Creating a personal narrative, a “*her-story*”, stands as a primary objective of feminist agendas in scientific institutions. According to Cecilia Maria Sardenberg, this objective “is formulated from the realization that, historically, modern science has objectified us women, denied us the capacity and authority of knowledge, and has been producing knowledge that does not at all meet our emancipatory interests” (Sardenberg, 2001, p. 1). Furthermore, this perspective challenges notions of “neutrality” and “truth” attributed to a science supposedly produced exclusively by men.

The idea of “neutrality” not only conceals social, racial, and misogynistic values but also encompasses discriminatory practices, such as the persecution of midwives and the barring of women’s participation in scientific associations. According to Bandeira (2008, p. 212), not only was the exclusion of the female presence made explicit in terms of naturalization, but it was overly justified by the incapacity and the obscurantism of women; as opposed to men, who were noted by light and objectivity. As women established themselves as producers of science, they were, in turn, expected to be mentored by men. The scientist Marie Curie is an example of this practice, given she had to share the Nobel Prize with her husband after winning it in 1903.

These and other instances highlight that from the emergence of modern Western science until the early 20th century, there was resistance to the idea of allowing women to produce scientific knowledge. According to Marina Fisher Nucci, “the exclusion of women from science would, therefore, be constitutive of the very definition of what science is: objective, rational, universal, impersonal and, therefore, necessarily masculine” (Nucci, 2010, p. 4). Such practices contributed to women being socially

perceived as less rational than men and deemed incapable of engaging in various fields considered masculine. Numerous studies have been carried out to justify the purported biological incapacity of women to perform certain activities, classifying them as cognitively inferior (Michael Schiff, 1993), based on perceived differences in women's bodies.

These characteristics can include peculiarities regarding the voice, which is weaker, tender, sweet, and high-pitched; sleep, less deep, of shorter duration, and more disturbed; digestion, requiring less food; breathing, producing less blood; and even circulation, which is livelier and better equips the arteries of the pelvis to supply more blood to the genitals (Rohden, 2010, p. 405).

Fabíola Rohden (2010) lists various value judgments used as scientific arguments in anthropological research to substantiate the alleged inconstancy of female nature.

[...] Women are extremely impressionable and unstable. They are always and constantly concerned with the immediate causes that produce the most diverse sensations, which would qualify its frivolity, nature would have already defined and qualified men and women to fill specific roles. Women are more emotional, while men are more intelligent. In the world of science [...] there are only chances for the latter (Rohden, 2010, p. 409).

In view of these arguments, it becomes evident that male scientists not only used their research to exclude women from fields they deemed necessary to confine them to domestic life but also sought to demoralize and scientifically inferiorize them. Women were often stereotyped as emotional and affective, limiting their societal role to childcare and household chores. This contributed to the gender hierarchization in society, as the exclusion of women from various activities, including science, made it easier to attribute to them a perceived lack of intellectual and manual capacity. They were effectively barred from engaging in various professions. Sandra Harding points out that:

[...] when in different cultures, or women and men within a culture, are assigned different interactions with natural and social environments, have different interests, draw on different discursive resources, and organize differently the production of knowledge, they will tend to develop distinctive bodies of systematic knowledge and systematic ignorance. For example, those who are assigned infant care and those assigned the care of motorcycles (to stick to stereotypes) will develop distinctive patterns of knowledge and ignorance of nature and social relations (Harding, 2007, p. 167).

Gender issues in the sciences entail various aspects. Apart from the historical inequality that hindered female scientists from attaining the same credibility as their male counterparts for an extended period, much of the knowledge produced during

that era was extremely prejudiced and defamatory. As women began to occupy their rightfully due spaces and scrutinize research involving their bodies, challenging prominent figures in modern science led to discomfort in academia. In this sense, Carolyn Merchant criticizes Francis Bacon's misogynist vision of doing science, as he compared the activity to dominating "woman-nature":

Another contribution [from female scientists] refers to the interpretation of classic authors in several academic fields, enabling a better understanding of strategies regarding the exclusion of women's experiences. If, on the one hand, feminist thought formulated its first critiques as a reaction to the permanence of the patriarchal order, which reduced women to invisibility and silence, on the other hand, it openly challenged the dominant thought, raising the question: do science and theory have a sex? (Bandeira, 2008, p. 220).

Another aspect to consider is that women felt compelled to emulate a masculine appearance in order to be respected in scientific fields. This was influenced by the prevailing stereotype that the modern scientist was male, possessing all the knowledge and occupying a superior social position. Conforming to this stereotype was seen as a marker of wisdom. Some authors argued in favor of the "masculinization" of women to ensure minimal respect and advancement in their scientific careers— "even the great English feminist Mary Wollstonecraft, in her efforts to create equality between the sexes, encouraged women to become 'more masculine and respectable'" (Londa Scheibinger, 2001 *apud* Bandeira, 2008, p. 213).

As the second wave of the feminist movement gained momentum in the 1970s, numerous authors conceptualized what are now recognized as feminist critiques of science. According to Evelyn Fox-Keller, the feminist movement "aimed at changing the conditions of women, recognizing fully that to do so meant changing the world. Out of the overtly political project soon emerged an intellectual, and even academic, project: feminist theory" (Fox-Keller, 2006, p. 15). This movement resulted in a restructuring of the role of women in science and society.

From then on, the bias of science and the entity responsible for it—the white European male—were highlighted. Bandeira argues that "women, as individual and collective subjects and as subjects of knowledge, have shared the same exclusions and uncertainties as other social groups in the paths of scientific construction, such as certain ethnic-racial groups" (Bandeira, 2008, p. 211). Many groups realized that they did not belong to the elite that controlled scientific production, but instead to a lower class that was not mentioned and whose participation was not recognized. This understanding demonstrates that:

*gender and science studies* are more complex as they problematize the very constitution of modern science, which is based on androcentric assumptions. They are also characterized by a strong questioning of the authority attributed

to scientists and science, deconstruction of the ideal of scientific neutrality, and reflection on how science feeds into gender hierarchies in society. Studies in this area also seek to identify biases, assumptions, and gender metaphors that are produced by scientific knowledge (Maria Teresa Citeli, 2001; Sardenberg, 2002; Kenneth Rochel de Camargo Jr.; Rohden; Carlos Caceres, 2009 *apud* Nucci, 2010, p. 3).

To deconstruct the supposed neutrality of science and the use of reason, feminist critics have confronted the idea that there is a single universal science, and, therefore, a sole image of a scientist. The issue of neutrality has also directly affected the reputation of women scientists, considering that gender biases based on scientific arguments continue to support sexist and androcentric premises. From this perspective, they question and seek to understand women's social roles over time and how women have been subjugated by men in each of these roles to the present day.

Regarding feminist criticism, Bandeira highlights that:

Since feminist criticism was first spoken of, it has generally appealed to the block of heterogeneous currents that attempt to explain why women largely continue to live in subordinate conditions, since at the core of any feminist current lies the recognition of a social and cultural female condition of subordination. Therefore, feminist criticism makes explicit, incorporates, and assumes individual and collective awareness; this is followed by a rebellion against the forms of understanding present in sex/gender relations; the subordinate position that women occupy in a given society, in a given moment of history, as well as in the production of knowledge. It [feminist criticism] addresses a struggle to change/transform those relations and that situation (Bandeira, 2008, p. 210).

Feminist critics deconstruct gender issues rooted within academia. The goal is to modify the sexist structures upon which science is built without disregarding scientific achievements; thus, a new model of science could be built and become more welcoming and receptive to women. One strand of feminist criticism, called gender and science studies, "is concerned with making visible, interpreting and analyzing the presence or absence of women in scientific practice, drawing attention to the historical exclusion of women in science" (Citeli, 2001; Camargo Jr.; Rohden; Caceres, 2009 *apud* Nucci, 2010, p. 3).

This paper investigates the reasons behind the lack of recognition given to Carolyn Merchant's work to this day within the history and philosophy of science fields. Merchant's work falls into a different category of women and science studies that Citeli (2001) classifies as:

[...] epistemological investigations that raise questions about the implications of what is understood by the scientific enterprise (including the epistemic

and cognitive authority attributed to scientists) for current gender cleavages, suggesting doubts about the possibility and explanatory capacity of the sciences regarding nature (Citeli, 2001, p. 131).

Carolyn Merchant's *The Death of Nature* addresses crucial aspects of the history of science, linking women's participation in society to changes in their images and the transition from active life to passive and subservient life, economically, politically, and socially, in relation to men.

### *The Need for Counter-Histories of Science and the History of Science Written by Women in Brazil*

Carolyn Merchant is an American historian who, although widely recognized nationally and internationally across feminist and environmental studies, has received little attention in the history and philosophy of science. Iohana Santarelli (2023) searched different databases, such as *SciELO*, CAPES Periodicals Portal, and the Brazilian Digital Library of Theses and Dissertations, and found an almost complete absence of works citing Merchant and her seminal work *The Death of Nature: Ecology, Women and the Scientific Revolution*.

Concerning theses and dissertations, no paper published in Brazil to date has presented the work as an object of study. In addition, 65 citations of *The Death of Nature* were found in Web of Science, and published between 1980 and 1990; the vast majority were related to feminism, environmentalism, and ecofeminism. The few citations related to the history and philosophy of science, in turn, referred to review texts or critical reviews of the work written in English. In Portuguese, only one review published in 2020 was found. This situation reinforces the need for literature written by women in the field of history of science. At least, this is what we see from Carolyn Merchant.

For Maria Margaret Lopes,

the men who faced the difficulties of this field for the sake of science are considered heroes. The women are considered adventurers. In the context of the struggles for independence in Latin America, when there was no way out, and women's histories had to be made official, those who dared to fight, who had been rebels, who had been insubordinate, who had disobeyed their husbands, who had defied institutions and metropolises, who had fled with lovers were transformed, through domesticated biographies, into exemplary models of wives and mothers, and above all, into patriotic heroines (Lopes, 1992, p. 367).

These reasons are presented in Carolyn Merchant's work, in which she exposes men's views of women during the European Scientific Revolution as opposed to important moments in history. In this book, the author shows how the great men of

modern science have promoted the construction/destruction of the image of women and nature in society. This idea has influenced the persistent notion that women are inferior to men. They were active agents in devaluing women and nature. According to Susan Griffin,

she [Merchant] described how the Scientific Revolution transformed nature into “dead things” controlled and constructed by human (mostly male) agency. She further draws out the implications from metaphors of scientists as the new priests controlling and torturing nature (based on the language used in Christian Europe during the witch trials) (Griffin, 2019, p. 25).

The book breaks with the “official” version of the History of Science, which is mostly told from a Western point of view and with male protagonists, and presents an alternative narrative that shows what has happened to women over the years. The names of women who have contributed to the construction of modern science are not widely known. This perspective helps us to understand how the patriarchal structure was consolidated in society and how science played a fundamental role in transforming metaphorical visions into reality. It also allows us to critically analyze the discriminatory and exclusionary theories formulated in this period and prolonged for many others.

The introduction of new perspectives of analysis, and other ways of thinking breaks with dominant categories of social theory, expressing new paradigms in the production of knowledge, as well as the construction of new fields of knowledge and power. In other words, its contribution implies an openness to otherness, a denial of any perspective that is essentialist and binary. It contemplates the space inhabited by the pluralistic experiences of women, constitutive of the social experience of modernity, as well as the emergence of new thematic and categories derived from such experiences. (Bandeira, 2008, p. 221).

These narratives, when viewed from a new perspective, can be regarded as Counter-Histories of Science. Barbosa defines the Counter-Histories of Science “as a historical approach to science that adopts the perspective of the oppressed, defeated, and excluded groups, who have been rendered invisible by the history of Western science” (Barbosa, 2021, p. 24).

Counter-histories of science serve the purpose of rescuing buried histories, giving voice to people who have been silenced. Not only do they challenge the universalizing discourses of intellectual, racial, and gender superiority, but they also explore the omissions and historical displacements that converge to legitimize an oppressive reality; one of whose expressions is the concealment or denial of women’s scientific production (Barbosa, 2021). Science in Brazil was no different, given that women hardly feature as protagonists in the history of science here.

Thus, when discussing science under feminist guidelines—which offers a more welcoming and receptive space for women—the focus is not solely on current scientific production. Rather, it involves the recovery, advancement, and creation of new traditions that bring attention to women and gender relations within scientific endeavors” (Lopes, 1992, p. 366). A recent study conducted by Santarelli (2023) analyzed postgraduate teaching programs in the History and Philosophy of Science field in Brazil. The findings revealed an almost total absence of female authors as bibliographical references. This indicates the exclusion of not only women but also diverse groups who have made significant contributions to the development of science as we know it today. According to Barbosa,

in Western scientific literature, there are few authors (Ivan Sertima, 2007; Clifford CONNER, 2005; John D. BERNAL, 1969; George SARTON, 1927) who mention the contribution of Arabs, Indians, Africans, Chinese, and other ethnic groups to what would come to be called modern science. The lack of a history of science keeps invaded and/or colonized peoples in a position where they solely reproduce and consume the scientific and technological practices and products of developed countries (Barbosa, 2017, p. 222).

Carolyn Merchant’s *The Death of Nature: Women, Ecology and the Scientific Revolution* is an alternative reference to the male-centric and reductionist history of Western science that is hegemonically disseminated in our schools and universities. This more comprehensive approach to the History of Science, which places women and nature at the center, casts a critical eye on science education in Brazil.

### *The Death of Nature: Women, Ecology and the Scientific Revolution*

Carolyn Merchant’s *The Death of Nature: Women, Ecology and Scientific Revolution*, published in 1980 and the central subject of this paper, was and continues to be fundamental to studies in the history and philosophy of science. The book broadens and redefines the history of science from a feminist and environmental perspective, as it encompasses underlying economic and gender dimensions of what we know as modern science.

Reading and studying Merchant’s work is essential to understanding how the relationship between nature and society has been conceived throughout history, as well as to understanding how nature has been exploited to serve the interests of the European nobility and bourgeoisie in favor of scientific progress and economic growth. Furthermore, Merchant’s work explores the different constructions of the image of women throughout periods of economic change in society. Women, once associated with nature, came to be conflated with it; hence, they became prone to being subject to the exploitation and domination of the modern man.

The process of mechanizing the world picture removed the controls over environmental exploitation that were an inherent part of the organic view that nature was alive, sensitive, and responsive to human action. The mechanism took over from the magical tradition the concept of the manipulation of matter, but divested it of life and vital action. The passivity of matter, externality of motion, and elimination of the female world soul altered the character of cosmology and its associated normative constraints. In mechanical philosophy, the manipulation of nature ceased to be a matter of individual efforts and became associated with general collaborative social interests that sanctioned the expansion of commercial capitalism. Increasingly, it benefited those persons and social classes in control of its development, rather than promoting universal progress for all. It was intimately connected to an empirical philosophy of science and a concept of the human being as a designer of experiments who, by wresting secrets from nature, gained mastery over its operations. (Carolyn Merchant, 1980, p. 111).

Throughout the book, Carolyn traces a history that spans the 16th and 17th centuries and unequivocally exposes the misogynistic atmosphere in which natural philosophers, priests, and other intellectuals belonging to the European nobility and bourgeoisie came together to misrepresent women. They justified exploitative acts on nature through arguments that compared women's bodies to parts of the Earth. For instance, in alchemy, minerals were considered to be the fruit of the Earth's womb in a gradual process. In the modern era, mines came to be seen as a "vagina" from which metal had to be extracted. This creation of symbols represented the mechanizing and artificializing of life and nature, stripping away the divine gift represented by the begetting mother and transforming woman into a sexualized being over whom man could exercise control (Merchant, 1980).

The new method of interrogation was not through abstract notions, but through the instruction of the understanding "that it may in very truth dissect nature." The instruments of the mind supply suggestions, those of the hand give motion, and aid the work. "By art and the hand of man," nature can then be "forced out of her natural state and squeezed and molded." In this way, "human knowledge and human power meet as one." Here, in bold sexual imagery, is the key feature of the modern experimental method—constraint of nature in the laboratory, dissection by hand and mind, and the penetration of hidden secrets— a language still used today in praising a scientist's "hard facts," "penetrating mind," or the "thrust of his argument." The constraints against penetration in Natura's lament over her torn garments of modesty have been turned into sanctions in language that legitimates the exploitation and "rape" of nature for human good. (Merchant, 1980, p. 171).

For Susan Griffin, *The Death of Nature* “shatters two of the most fundamental and destructive assumptions of Western culture: the idea that nature is dead matter, made up of things to be manipulated and exploited at will, and that women, being so close to nature, are biologically inferior to men” (Griffin, 2019, p. 18). Along these lines, and in reference to Francis Bacon’s thought and scientific method, Merchant observes that

This method, readily applicable when nature is denoted by the female gender, degraded and made possible the exploitation of the natural environment. As a woman’s womb had symbolically yielded to the forceps, so nature’s womb harbored secrets that, through technology, could be wrested from her grasp for use in the improvement of the human condition (Merchant, 1980, p. 169).

However, the issues addressed in the book go far beyond the exclusion of women in political and social spheres. The author refers to various misogynistic texts and artistic expressions that culminated in the persecution and death of thousands of women during the period known as the “witch-hunt”.

The interrogation of witches as symbols for the interrogation of nature, the courtroom as a model for its inquisition, and torture through mechanical devices as a tool for the subjugation of disorder were fundamental to the scientific method as power. For Bacon, as for Harvey, sexual politics helped to structure the nature of the empirical method that would produce a new form of knowledge and a new ideology of objectivity seemingly devoid of cultural and political assumptions (Merchant, 1980, p. 172).

In making this point, Merchant establishes a connection between the witch-hunt period and the process of building modern science. She emphasizes that this dark period of persecution of women cannot simply be forgotten or treated as a fanciful element of European history, as is often the case in Hollywood films. On the contrary, it should be remembered as a genocide generated from the hatred fueled by men against women, whose purpose was to remove them from positions of mystical, healing, economic, and intellectual power, even over their own bodies.

This persecution of women, which mainly affected those who were elderly and poor, marked the beginning of greater female submission to men. During this period, “female roles would increasingly be defined in terms of domestic functions as middle- and upper-class women became economic subordinates in the marriage relationship” (Merchant, 1980, p. 148). The intellectuals of the time, whether religious or pagan philosophers, used defamatory discourses based on rigorous arguments, which, combined with their position of power in society, served to invalidate and subjugate women and nature. For Susan Griffin,

through rigorous historical research, what Merchant does in *The Death of Nature* is to show us that, far from liberating women by reducing nature to a mechanism without a soul or intrinsic meaning, the Scientific Revolution and its accompanying technologies also reduced the *status* of women in Western society, even to the point of aiding in the persecution and massacre of women healers (Griffin, 2019, p. 19).

The premise that life originated from the union of dead matter, represented by the feminine nature, with the “essence” of the soul coming from the masculine nature, has been present in many philosophical and/or scientific discourses over the centuries. This conception has contributed to the creation of inferior and exclusionary practices for women in different work areas, including their access to higher education.

Carolyn Merchant mentions various fields of activity, such as weaving, brewing, and, above all, midwifery, which were traditionally carried out by women. However, over time, these areas were gradually dominated by men. Midwives, in particular, were persecuted, defamed, and labeled as witches, losing control over their profession to men with little or no knowledge of childbirth.

The invention of the forceps, a metal instrument for delivering babies, represented a new technology being incorporated into obstetric practice, and replacing the traditional techniques used by midwives. In addition, this instrument became a symbol of power for male surgeons, who claimed control over the process of giving birth and over women’s bodies. William Harvey (1578–1657), one of the most prominent natural philosophers of this period and often considered the father of modern science, played a significant role in promoting the use of the forceps as he supported surgeons’ obstetric practices through written treatises.

## Final Remarks

Rereading and retelling the history of science from a feminist perspective means, above all, shedding light on what was previously hidden: the misogynistic constructions created by Catholic priests, intellectuals from the European nobility, and natural philosophers, before and during the emergence of what is conventionally called modern Western science. Feminist historians demand their rightfully deserved space in the History of Science. Without denying the achieved scientific progress, they denounce the restrictive, symbolic, and physical violence against female bodies, as well as against nature, which Carolyn Merchant also emphasizes in her work.

For Merchant, women were not simply discouraged from engaging in scientific practice, but were excluded and even murdered through what has come to be called witch-hunts. She argues that, as modern science consolidated, women were seen as the antithesis of what science represented. While *Homo sapiens* claimed to know and dominate, woman-nature was portrayed as submissive and lacking in intelligence.

Likewise, domestic life was imposed on women, who were excluded from the various scientific and non-scientific activities. The spaces previously occupied by them were gradually taken over by men, who began to naturalize their position in society through artificialities.

Finally, we emphasize that this discussion has relevant implications for science education, both in schools and universities, which mainly involves expanding and renewing bibliographic references that provide a more diversified view of science and its history. Following what is stated by Schiebinger (2001, p. 31), this approach means to “incorporate a critical awareness of gender into the basic training of young scientists and into the routine world of science”. Therefore, it is imperative for theoretical frameworks based on perspectives to be developed, written, and grounded, above all, by women.

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### *Conflict of Interest*

On behalf of all authors, the corresponding author states that there is no conflict of interest.

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