Abstract
Concerning Oscar Wilde’s The Picture of Dorian Gray, the previous studies have mainly been conducted on the writer’s aesthetic thoughts and moral senses reflected in this novel, while the relationship between his literary creation and his psychological appeals needs to be further explored, for possibly these appeals are essentially related to his multiple personalities and complex psychology. Focusing on the three male characters, this paper attempts to examine Wilde’s psychological appeals for the recognition of his aestheticism and the acceptance of his non-aesthetic appeals, and how they are revealed in the novel. According to A. H. Maslow’s hierarchy of needs theory, human needs include the physiological need, the safety need, the belongingness and love need, the esteem need, and the need for self-actualization and so on. Through close text analysis, this study has had the following findings: (1) As an artist, Wilde’s pursuit of art is the expression of his appeal for self-actualization. The interpretation of aestheticism by Basil and Henry denotes this need of Wilde; (2) As an aristocrat, Wilde also wants to be respected by the society, which is reflected in Dorian, while as an ordinary man his love need and physiological need are reflected in Basil’s feelings for Dorian and Henry’s admiration for hedonism. Hopefully, this study might help readers better understand Wilde and his works, and achieve a deeper understanding of the artist’s complicated personality and psychology, the complexity and difficulty of the artistic creation, and various forms of artistic expressions.

Keywords: The Picture of Dorian Gray, Oscar Wilde, psychological appeal, aestheticism

1. Introduction
As one of the representative works of Oscar Wilde (1854–1900), who is the famous Irish advocator of “art for art’s sake,” The Picture of Dorian Gray has always been heatedly discussed. The previous researches of this novel have mostly dwelt on the sense of traditional morality and the aesthetic thoughts of this novel, in that many scholars are concerned with aestheticism and the contradiction in Wilde’s personal lives, and Wilde’s sexual orientation has often been studied as a main aspect of these contradictions. However, there is still a need of further study concerning Wilde’s own psychological appeals and the relationship between the literary creation and his complex personality structure. Throughout the whole novel, in which Lord Henry Wotton, Dorian Gray and Basil Hallward are the three main male character, the conflicts between characters coincide with Wilde’s complex personality structure and reveal his multiple needs or appeals.

This paper will analyze these characters combined with Wilde’s personal experiences to reveal his psychological appeals for the recognition of his aestheticism and acceptance of non-aesthetic appeals in the novel (including the appeal for the social acceptance of his self-identity, the appeal for the social acceptance of platonic love, and the appeal for the social acceptance of his hedonism), and the complex personal structure reflected in the characters. Firstly, the study will have a short overview of the studies on Wilde and the novel, and try to seek the possible research space. Then, it will analyze Wilde’s aestheticism and the male characters in The Picture of Dorian Gray, so as to further explore Wilde’s psychological appeal for the recognition of aestheticism. Next it will discuss the writer’s non-aestheticism appeals, including the appeal for social acceptance of his self-identity, the appeal for social acceptance of platonic love, and the appeal for social acceptance of hedonism. At last, this study will summarize the previous sections and restate the significance of it.

Through the analysis of the complexity of Wilde and the three main male characters in The Picture of Dorian Gray, this study hopes to help readers achieve a better understanding of the complex psychology of an artist in
general and Wilde in particular, a grasp of the relationship between the artist’s creation and his or her psychological appeals, which might provide some implications for the interpretation of other literary or artistic works.

2. A Short Overview of the Studies on Wilde and His The Picture of Dorian Gray

Many studies have been conducted on The Picture of Dorian Gray, concerning the biography, the senses of morality and aestheticism. Some scholars have undertaken The Picture of Dorian Gray from the perspective of Wilde’s personal characteristics. Aatos Ojala (1956, pp. 215–216) has studied Wilde and aestheticism in his work Aestheticism and Oscar Wilde, which focuses on aestheticism and its propositions, such as the philosophy, historical background, and psychological characteristics of aestheticism. It includes applied aesthetics and art criticism, art theory and philosophy of life, such as Wilde’s aesthetics theory and his mature thoughts. In Oscar Wilde: His Life and Confessions (1916) by Frank Harris, there are facts or facts as Harris sees them. At the end of volume one it dawns on Harris that Wilde is homosexual when he hears it from the writer himself. Richard Ellmann’s (1988) biography about Wilde’s life includes his early years, his love and marriage, his indoctrinating in America, his hard prison life, and his subsequent exile in France and Italy. Nell McKenna’s The Secret Life of Oscar Wilde (2003) draws on newly discovered interviews with some of the witnesses at Wilde’s trials, as well as numerous unpublished memoirs and diaries. This meticulous reconstruction of Wilde’s “sexual journey” breaks important new ground by placing Wilde at the center of a pantheon of gay sexual revolutionaries. In short, these biographies mainly examine Wilde’s personal life, but not discuss fully the relationship between Wilde’s personal life and his literary creation. “Pleasure was everything to him, but grief and pity followed his pleasure-mad ways. This is something that we need to understand in our times” (Zacharias, 2002, p. 7). Ravi Zacharias brilliantly formulates an imaginary conversation between God, Wilde and Pascal about reality and pleasure. This author holds the view that God is not against the pursuit of pleasure, and Wilde’s view on the pursuit of pleasure is revealed in this imaginary conversation as well. Focusing on the psychological trauma of narcissism and how social alienation has brought about Dorian Gray’s mental breakdown, Ali Taghizadeh (2014, p. 1446) states that Dorian’s tragedy is both influenced by himself as a narcissist and the society of that time, while Huang Yujie (2013, p. 18) points out: “So there might be a certain psychological appeal of Wilde who always had to wear masks to live in his age—that was, he wished to be recognized among the upper-class society.” She examines Wilde’s psychological appeals for recognition for aestheticism and acceptance for homosexuality. However, her study is confined within two appeals of Wilde and cannot adequately interpret Wilde as a complicated person.

The researchers mentioned above have mostly dwelt on the sense of traditional morality or the aesthetic thoughts of this novel, in that many scholars are concerned with aestheticism and the contradictions of Wilde, and Wilde’s sexual orientation is often studied as the focus of these contradictions. Anyhow, there is still a need of further study concerning Wilde’s psychological appeals or needs and their relationship with his artistic creation. According to A.H. Maslow’s hierarchy of needs theory, human needs generally include the physiological need, the safety need, the belongingness and love need, the esteem need, and the need for self-actualization, while “in some individuals there is a truly basic aesthetic need” and “they crave actively, and their cravings can be satisfied only by beauty” (1970, p. 51, author’s emphasis). It’s no objection that Wilde is a representative of such individuals, for whom the satisfaction of aesthetic need or appeal (one of the higher needs) is closer to self-actualization, though non-aesthetic appeals might play some roles in their lives and careers as well.

These multiple appeals are closely related to the writer’s personality structure, denoting different aspects of the self. According to S. Freud’s theory of personality structure, a complete personality structure consists of three systems: id, ego, and superego. These three systems of a normal person are harmonious and unified, while those of a person with imperfect personality might be in an abnormal state (Li & Ye, 2008, p. 44). The root of various troubles is mainly associated with id, which, as the instinctive self, tends to ignore the existence of value, good and evil, and morality (superego). The only purpose id pursues is satisfaction and happiness. The result of the struggle between id and superego might determine the state of an actual self (ego) in action. In the case of Wilde, his complex personality structure and the different aspects of the self are interwoven with the aesthetic appeal and non-aesthetic appeals, which are revealed in the three main male characters in The Picture of Dorian Gray. As Wilde’s own words recall, these three characters combine to formulate the portrait of writer himself, denoting his complex personality structure: “Basil Hallward is what I think I am; Lord Henry what the world thinks me; Dorian what I would like to be—in other ages, perhaps” (Cited by Huang, 2010, p. 6, the same source for the quotation of these items in the following sections).

Next two sections will examine Wilde’s aesthetic appeals and non-aesthetic appeals respectively, and accordingly how the male characters reveal them.
3. Oscar Wilde’s Aesthetic Appeal and the Male Characters in The Picture of Dorian Gray

3.1 Oscar Wilde’s Life and His Aestheticism

Wilde was born to a family of intellectuals in Dublin on October 16, 1854. He started to love art and literature even when he was a child and showed his outstanding artistic talent very early. It was in the middle of the 19th century when Wilde went to Oxford University to study, and the aestheticism movement was in the ascendant in England. John Ruskin and Walter Pater, two famous Oxford professors at that time, were the pioneers and backbone of this movement. It was during this period that Wilde formed his own unique aestheticism aesthetics. He studied and synthesized aestheticism developed by his predecessors, and thus established his own rigorous and marvelous aesthetic thoughts which includes the autonomy of art, individualism, and New Hedonism. In 1895, Wilde was arrested for “gross indecency.” Since then, British aestheticism began to decline.

Wilde’s Intentions which were originally published in 1891 displays his biting wit and extensive study of art, criticism, literature, and society. It includes “The Critic as Artist,” “The Decay of Lying,” “Pen, Pencil and Poison,” and “The Truth of Masks.” These four essays and the contemporary essay “The Soul of Man Under Socialism” confirm Wilde’s aestheticism and supply the philosophical context for his novel The Picture of Dorian Gray.

“The Decay of Lying” mainly analyzes the autonomy of art and the power of lying, in which Wilde opposes realistic interference of art and claimed for the autonomy of art is like previous aesthetics. For Wilde, the sentence that “Life imitates Art far more than Art imitates Life” is the most famous claim in this work. As to the autonomy of art, he refuses to evaluate art by conventional moral standards, claiming that “all art is immoral and all thought dangerous.” Lying can be put in other way as the imagination which Wilde advocates in artistic creation—“The final revelation is that Lying, the telling of beautiful untrue things, is the proper aim of Art”.

In “The Critic as Artist,” Wilde posits the autonomy of art and rearranged the relationship between art and critic. He inherits Pater’s thoughts on art’s influence on reality. He claims the superiority of art over real life. He also maintains that art is the very method to gain perfection, which can also be interpreted as art’s function in developing individualism. One theme in this essay is that criticism is creation, suggesting the new role of criticism in literature.

Wilde gives further supplement to Pater’s New Hedonism in The Picture of Dorian Gray and “The English Renaissance.” In the latter, he claims that life is in many ways an aestheticized form or New Hedonism which is the satisfaction of desire and will. In the former, through Henry’s words Wilde points that Dorian represents a New Hedonism advocated by Pater and him. Henry induces Dorian to pursue sensual enjoyment. Besides, Wilde restates Pater’s emphasis on momentary experiences. Wilde believes that experience is the goal of real life. Therefore, human should focus on moments in order to enrich his life. Such hedonistic views run through the whole novel.

3.2 Analysis of Oscar Wilde’s Aesthetic Appeal Revealed in the Male Characters in The Picture of Dorian Gray

3.2.1 Henry’s Aesthetic Appeal

“Lord Henry is what the world thought I was.” Wilde, a maverick, being bohemian and unrestrained, has his own cynical theory. That is the same with Henry in the novel. The influences Henry exerts on Dorian is that of the id on the ego. This id wants to understand his instinctive desire and vent his instinctive impulse through the ego. He is against orthodox social morality and cynical. His articles are full of disdain and ridicule of the upper class, but his talent makes him one of them. However, unlike Wilde, Henry never puts his ideas into practice. Wilde himself was a practitioner in his life. In addition to writing, his behaviors have highlighted his exceptional personality. For Wilde the happiness principle pursued by his id was advocated and much respected.

Anyhow, Wilde and Lord Henry have many characteristics in common in most people’s views. The contest between the id and the ego revealed Wilde’s struggle. It was both a blessing and a misfortune for him to live in the obstinate and biased period of the late Victorian era. In such a society at that time, people’s words and deeds must be consistent with strict social behaviors and moral norms. Even a minor deviation from the norms would be regarded as breaking away from them. The principles of art and literature have been abandoned, for social norms must be abided by. Henry’s preachment of his aesthetic thoughts reveals his appeal for the acceptance of his view towards art and ethics, while in Wilde’s eyes “art is destroyed by life and morality, and that ethics and aesthetics belong to separate spheres of thought and judgement” (Mighall, 2018, p. 26). For Wilde, one of the energies of art asserted an isolation from experience and “[a]rt is a kind of trick played on nature and God, an illicit creation by man” (Ellmann, 1998, p. 378). Wilde once claimed that art would be ruined by the reality (2000, p. 98). Hereafter only the page number of this textbook referred to in parenthetical citations. Similarly,
Henry’s view of art is that art has nothing to do with real life and morality, and real life can destroy the beauty of art. Henry doctrines that art has nothing to do with morality and he tries to make Dorian to accept this idea (p. 100). In the real life, Sybil Vane is not beautiful, though she is a part of art when she plays Juliet on the stage. Here, Wilde uses the character Sybil Vane to explain the relationship between art and reality.

Henry makes every effort to praise beauty. In his mind, beauty is most important in the world, which is just in accordance to Wilde’s aesthetic idea. Henry thinks that beauty is a form that is higher than genius (p. 24). For Henry, beauty is like sunlight and it cannot be questioned in that beauty is the wonder of wonders. “It is only shallow people who do not judge by experiences. The true mystery of the world is the visible, not the invisible” (p. 24). He doctrines aestheticism to Dorian and continuously puts the aesthetic thoughts into Dorian. He tries to persuade Dorian to cherish his youth and show him what beauty is.

3.2.2 Basil’s Aesthetic Appeal

Wilde once denoted: “Basil Hallward is what I think I am.” This painter, who pursues the beauty of art, is the superego in this novel, which is undoubtedly a bitter medicine for ego. It reminds ego to regulate its own behavior and helps it resist the desires. When ego makes mistakes, superego requires self-examination of the conscience. Surely it can make ego suppress the request, but this might bring some pain to ego as well. Moreover, the medicine under superego is too mild and slow to take effect, leading to a bad result for ego. To Dorian, Basil is a kind of alarm that remind him to abide by morality and protect his pure heart. He is the guardian of traditional morality in the novel. After Sybil’s death, compared with Henry’s coldness, Basil thinks that Sybil’s death is a tragedy, but it never crosses to him that Dorian has done cruel deeds to Sybil before her death. In his eyes, Dorian remains a piece of pure and beautiful art.

Basil wants Dorian to keep pure and tries to protect him from bad influences, while Henry’s appearance leads Dorian to pursue sensual enjoyment and gradually get lost. After hearing horrifying rumors about Dorian, Basil tells Dorian that every gentleman is interested in his good fame and he doesn’t want people to talk of Dorian as something vile and degraded (p. 143). In Basil’s heart, Dorian is always perfect and pure—“But you, Dorian, with your pure, bright, innocent face, and your marvelous untroubled youth—I can’t believe anything against you” (p. 143). Basil thinks good fame is quite important for Dorian to maintain his perfect image. But after seeing the portrait, he realizes that the portrait has become twisted and ugly. The portrait has endured Dorian’s evil deeds and is not intact and beautiful as before. This is also an indication that real life could ruin art. Basil thinks that art will follow moral standards all the while, though it might be influenced by the reality. It is beyond his imagination that immorality can be fatal to art.

Basil’s understanding of the relationship between art and morality is a manifestation of Wilde’s contradiction as well. On the one hand, he advocates the autonomy of art, but on the other hand, his art is restrained by morality at some extent. This contradiction between art and morality reflects the contradiction and complexity of Wilde’s artistic creation.

4. Oscar Wilde’s Non-Aesthetic Appeals and the Male Characters in *The Picture of Dorian Gray*

4.1 Oscar Wilde’s Life and His Non-Aesthetic Appeals

Born in an Irish family which occupied a high social status, Wilde has lived a good life since he was a child. Wilde’s mother has a wide range of expressions, political ardent and social knowing. As a radical intellect, she provides his son with the inspiration and unique insights. Her passion for knowledge and art has set a further example for Wilde. Wilde inherited his mother’s rebellion. Maintaining the good fame of his family built by his parents was important for Wilde. As Dorian Gray wants to protect his intact appearance, Wilde also wanted to protect the perfect image of his family and himself. In *De Profundis*, Wilde expresses his regression for destroying the good fame of his family that his mother had maintained. As an Irish writer, Wilde gave people a sense of social alienation. Seeking social acceptance of his talent and life was important to him as well.

Concerning Wilde’s love, it was Robert Rose that induced Wilde to begin “the manner of murky dealings that disastrously defeated him in 1895” (Harris, 1916, p. 81). “The love of Wilde for Douglas was full of erotic passion and aesthetic meaning” (Huang, 2013, p. 28). Wilde’s sexual orientation was much influenced by Greek culture during his schooling. His academic experience at Trinity College in Dublin was especially influenced by J. P. Mahaffy who was a professor of Greek history. Wilde was very fond of Greek culture in his school days. Greek humanism emphasizes the individual value of human beings, respects the growth and choice of individuals, and human beings have the right to choose themselves and pursue happiness. These ideas provided the motive force for Wilde’s exaggerated dress and the brave pursuit of his favorite things in the future.

As a famous artist, behind his high position in the field of art, Wilde also has ordinary people’s appeals. These
appeals are revealed in the male characters in *The Picture of Dorian Gray*—Basil (representative of Platonic love), Henry (advocator of sensual enjoyment), and Dorian (contradictory perfectionists). Basil’s love to Dorian, which does not dare to speak its name at that time, is depicted by Wilde to convey his own appeal for social acceptance of platonic love. Through Basil’s advocating of sensual enjoyment, Wilde wanted to tell people that seeking for sensual pleasure was a wonderful experience rather than a sin. Dorian who later becomes crazy to maintain his perfect image just represents the hardship of Wilde protecting his good fame and social position. These three characters represent Wilde’s three appeals and are shaped by Wilde’s complex self.

4.2 Analysis of Oscar Wilde’s Aesthetic Appeal Revealed in the Male Characters in *The Picture of Dorian Gray*

4.2.1 Dorian’s Identity Plight

Dorian is a handsome man with finely-curved scarlet lips, and crisp golden hair. He has kept himself unspotted from the world. Dorian has not only intact appearance, but also high social status. However, Dorian is so naïve that after being continuously encouraged by Henry, he destroys himself by self-indulgence and moral decay in the end.

Dorian’s amazing appearance and high social status are alienated from most people in society. Inculcated continuously by Henry—“youth is the one thing worth having” (p. 24), Dorian begins to insist on protecting his youth and protecting his perfect image in the eyes of the world. He hopes that the portrait will bear the torment of years for himself. After bearing his sins, the portrait becomes uglier and uglier, but Dorian’s own face remains intact. Under Henry’s instigation, Dorian can only accept the beauty and youth of his own. In order to hide his dark side, he hides the painting in the attic. Basil, who is the only person has seen the ugly portrait is killed by Dorian. In order to maintain his perfect image, Dorian has gone crazy.

“Dorian what I would like to be—in other ages, perhaps,” Wilde once stated. This Dorian, whom Wilde wanted to be, represents the straggling and complicated soul of Wilde. It is Dorian that represents ego in the novel. Dorian is gradually dominated by Henry who stimulates his instinctive impulse and desire. As the id, Henry drives the ego to indulge into the sensual enjoyment. On the one hand, he wants to satisfy the id’s desire, but on the other hand, he wants to restrain the id’s impulse. Dorian once doubts his choice, but the id is so strong that the ego finally accepts the idea of id. The ego has been trying to get rid of the id. But every time he comes home and opens the secret room to watch the portrait, which stands for the superego, he is tortured. This reflects that the ego is always resisting the id.

Dorian wants to enjoy the pleasure, while keeping the perfect image in the eyes of the public. He doesn’t want to follow the moral norms that people all obey, but he can’t get rid of them, in that although he wants to stand out, he wants to be accepted by the society as well. As Dorian can’t get rid of the constraints of the portrait, Wilde can’t get rid of the traditional norms, either. Wilde moved to London later, but he could not eliminate the truth that he is an Irish man. Longing for acceptance by the society, He tried his best to maintain a perfect image in the society, which was like Dorian’s hiding his portrait. Wilde’s lifelong career was to break down the moral shackles. Relying on his brilliant talent and outstanding personality, he challenged the powerful feudal ethics everywhere. The destruction of superego in this novel unveils Wilde’s dissatisfaction with the social moral system at that time. What’s more coincidental was that Wilde was unfortunately arrested and his reputation has been completely ruined. Under the contempt and humiliation, Wilde died alone with the destruction of ego.

4.2.2 Henry’s View of Pleasure

Wilde’s works are full of disdain to the upper class. Like Wilde, Henry is cynical and against orthodox morality, however, his talent makes him a member of the circle. John Ruskin’s thought of harmonious combination of soul and flesh is reflected in Henry’s aesthetic idea—“Nothing can cure the soul but the senses, just as nothing can cure the senses but the soul” (p. 23). There is an inseparable relationship between the senses and the soul. That is to say that senses can satisfy and complete the soul, and the soul can excite the senses.

Wilde expressed his idea of enjoying pleasure fully by Henry’s preachment: “A new Hedonism is what our century wants” (p. 25). The purpose of the new hedonism is to experience itself, but not to produce fruit, whether it is sweet or bitter. The asceticism that stifles the feeling is not compatible with it, and the low sensual indulgence that numbs the feeling is also incompatible with it. The mission of the new hedonism is to persuade people to concentrate on the moment of life. It is not difficult to see that in Wilde’s new hedonism, there is another modernist idea, which is the praise of “nature,” “desire,” “ugliness,” and “youth.”

The thought of cherishing the youth and enjoying the sensual pleasure is both reflected in Henry and Wilde. Henry’s idea of emphasizing the importance of youth is similar to Wilde’s, as Wilde says in *De Profundis*—“Only youth has a right to crown an artist” (Wilde, 2000, p. 52). In addition to his pen, Wilde’s behaviors
highlighted his personalities as well. For him, being pursued by id was always a big concern in his life.

4.2.3 Basil’s Pursuit of Platonic Love

Basil’s love towards Dorian is obviously madness and exceeds his love towards art. Basil admits that he worships Dorian with far more romance of feeling than friendship, while he has never loved a woman. He tells Dorian that he has been attracted by his personality, and therefore has been influenced a lot by him. There is no denying that he adores Dorian madly, extravagantly, absurdly, and he is even jealous of every one to whom Dorian speaks. Basil wants to have Dorian all to himself: “I was only happy when I was with you. When I was away from you, you were still present in my art” (p. 110). This kind of emotion is the ideal mode of Wilde’s aesthetic love, that is, Platonic love, concerning which the Greek spirit is also an important spiritual source of aestheticism.

Basil’s love towards Dorian is Platonic interpretation of the artist’s need for his model. The relationship between Basil and Dorian cannot be merely called friendship. This reflects Wilde’s love towards Douglas. Dorian’s rejection of Basil’s courtship is cruel and painful for Basil. This love is difficult to tell and can hardly be accepted by the society, which is similar to Wilde’s love towards Douglas. The hardship of the love between Wilde and Douglas strengthens Wilde’s desire for the social acceptance of Platonic love. Here, Basil’s sexual orientation reveals Wilde’s appeal for the acceptance of Platonic love.

5. Conclusion

The Picture of Dorian Gray is like a mirror, through which people can observe Wilde from different angles. Through the analysis above, we may say that Henry, Dorian, and Basil possibly represent three aspects of Wilde’s self or personality structure. The entanglement and struggles between these characters reveal Wilde’s multiple psychological appeals.

Wilde and Henry are equally cynical in their attitude towards life. Wilde expresses his aestheticism by Henry’s words, who makes every effort to praise for beauty. He doctrines Aestheticism to Dorian and continuously puts the aesthetic thoughts into him. He tries to persuade Dorian to cherish his youth and show him what beauty is. This reflects Wilde’s psychological appeal for the recognition of his aestheticism. And Henry also preaches his idea of pleasure. His emphasis on carpe deim denotes Wilde’s psychological appeal for the acceptance of hedonism. Basil can be understood as a reminder of traditional morality. Basil, whose understanding of the relationship between art and morality is also a manifestation of Wilde’s contradiction. On the one hand, he advocates the autonomy of art, but on the other hand, art is restrained by morality at some extent. This reflects the complexity which lies in Wilde’s view of artistic creation. And Basil’s affection towards Dorian represents Wilde’s appeal for the acceptance of Platonic love. Dorian has to make hard choices between his desire and Basil’s moral restraint. At last, with the death of Basil, Dorian gets completely lost and goes to destruction. Similarly, Wilde didn’t overcome the temptation, his contact with Alfred Douglas caused imprisonment for him. Wilde was special and few people understood and supported him at that time. Dorian’s tragedy reflects that Wilde wanted to break the shackle of traditional morality and hoped his distinctive identity to be accepted by the society to some extent.

This study has arrived at its goal, if it might help readers achieve a better understanding of the complex psychology of an artist in general and Wilde in particular, a grasp of the relationship between the artist’s creation and his or her psychological appeals. It hopes to provide some implications for the interpretation of other literary or artistic works as well.

References


**Copyrights**

Copyright for this article is retained by the author, with first publication rights granted to the journal.

This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (http://creativecommons.org/licenses/by/4.0/).