



A Study on Xiaomi's Technological Innovation Strategy

Huiru Cheng*

School of Arts and Science, Rutgers University, New Brunswick, 08901, USA

*Corresponding author. Email: Huirucheng8@gmail.com

Abstract. With the accelerated development of global technology, technological innovation has become the core driving force for enterprises to maintain their competitive advantages. As a representative of Chinese technology enterprises, Xiaomi has achieved success in the fields of smartphone and smart home by virtue of Internet thinking and ecological synergy, and has entered the new energy automobile industry. In this article, Xiaomi's technological innovation strategy is investigated. Based on theoretical analysis, external environment analysis and SWOT case study, this article finds that Xiaomi shows significant advantages in R&D investment, industry chain synergy and market expansion. However, there are still high-end technology dependence, insufficient profitability and international compliance challenges. The findings suggest that Xiaomi's innovation strategy should adhere to the principle of "taking independent R&D as the focus and collaborative innovation as the supplement", strengthen R&D and talent investment in the short term, and achieve technological breakthrough and stable globalization in the long term. This study not only reveals Xiaomi's path of technological innovation strategy, but also provides a reference for other Chinese technology enterprises in formulating sustainable innovation strategy.

Keywords: Xiaomi; technological innovation strategy; new energy vehicle; R&D investment; collaborative innovation

1 Introduction

With the accelerated development of global technology, innovation has become a key factor for enterprises to maintain performance growth and enhance competitiveness [1][2]. The rise of emerging industries such as AI and new energy has made enterprises rely on continuous technological improvements to cope with rapidly changing market and uncertain external environment. At the global level, a game has begun between countries around science and technology innovation [3]. In particular, the tightening of U.S. policies around key technologies and supply chains, along with China's domestic policies toward independent innovation, have changed the boundaries and pace of competition in the industry. For Chinese enterprises, the tightening of external environment and the encouragement of internal policies, such as the "mass entrepreneurship and innovation" strategy, together with the expansion of global market, have created new opportunities for technological innovation. Over the past decade, Chinese enterprises have gradually transformed from being "followers" to "leaders" in some fields [4]. Xiaomi,

as a representative of these enterprises, has been growing rapidly in the fields of smartphone and smart home with the core concepts of "Internet thinking" and "technology-driven". Meanwhile, through the ecology of "hardware + software + Internet service", diversified competition is realized, showing the key role of technological innovation strategy. Since 2023, Xiaomi has entered the new energy automobile industry. The move not only means business expansion, but also exposes Xiaomi to the competition and uncertainty of a new industry, further testing its ecological synergy and technological accumulation. Therefore, studying Xiaomi's technological innovation strategy not only helps to understand the formation mechanism of its competitive advantage, but also provides a valuable reference for other Chinese technology enterprises in the process of internationalization and industrial upgrading.

A variety of theoretical frameworks have been proposed by academics regarding corporate innovation strategies. From a systematic perspective, national innovation system theory emphasizes the important role of policy environment, industrial support, and social institutions in promoting corporate innovation [5][6][7][8]. From a subdivided dimension perspective, resource-based theory emphasizes that enterprises should rely on their unique resources and capabilities to construct competitive advantage and provides a foundational perspective for understanding how technological innovation can enhance core competencies [9]. Diffusion of innovation theory explains the acceptance of new technologies and products at the market level and emphasizes that innovation performance is influenced by R&D and the speed of acceptance by consumers and markets [10]. Collaborative innovation theory emphasizes that enterprises have limited resources and can significantly improve their R&D efficiency and outcome transformation by collaborating with universities, research institutions or industrial partners [11][12][13]. Although there are more cases on enterprises' technological innovation strategies, the study still focuses on theoretical strategy models and impacts. There is still a lack of studies on the technological innovation strategies of specific science and technology enterprises, especially on cross-boundary enterprises.

This article takes Xiaomi's entry into the field of new energy vehicles as the research object and analyzes its business expansion and innovation practice. By combining relevant theories and combining internal and external environment analysis and case study method, Xiaomi's specific initiatives in R&D investment, industry chain synergy, market expansion and internationalization are systematically explored, and its strengths and weaknesses are summarized. On this basis, this article distills the main characteristics of Xiaomi's technological innovation strategy, further analyzes the key challenges, and puts forward suggestions for improvement, with a view to providing a reference for the research and practice of innovation strategy of other Chinese technology enterprises.

2 Conceptualization and Theory

2.1 Definition of Technological Innovation Strategy

Enterprise innovation strategy refers to the systematic innovation program formulated by an enterprise based on its own resources and capabilities in a specific market and policy environment in order to gain long-term competitive advantages [14]. It not only

covers R&D investment and the application of new technologies, but also involves the transformation of results, marketing and intellectual property management [15]. It centers on the interactions of various links, which together form the basis and driving force of innovation in the enterprise [16]. For enterprises, continuous innovation is essential to remain competitive [17]. For example, R&D investment can help enterprises continuously improve product performance, while patent protection and branding can help form long-term market barriers [18]. From a macro perspective, innovation can also promote industrial upgrading and economic development [19].

2.2 Types of Technological Innovation Strategy

The technological innovation strategies of enterprises are categorized into three types: including independent innovation, imitative innovation and cooperative innovation. First, independent innovation mainly relies on the enterprise's own R&D capability and capital accumulation to carry out independent R&D activities, so as to obtain R&D technology with independent intellectual property rights [20]. Under this model, independent innovation is the most risky, but if it succeeds, it can bring long-term competitive barriers in the market. Second, imitative innovation helps enterprises reduce R&D risks and enter the market quickly in a relatively short period by learning and improving existing technologies [21]. Imitative innovation requires low capabilities and can help enterprises enter the market quickly, but faces the risk of being dominated by the leading innovator. Third, collaborative innovation emphasizes the collaboration between enterprises and upstream and downstream enterprises, universities or R&D institutions, and is considered as an important way to enhance innovation efficiency. This model can increase the success rate of innovation through resource sharing, make up for enterprises' shortcomings in their own resources and capabilities, and realize the sharing of achievements on a larger scale [22].

2.3 Formulation and Implementation of Technological Innovation Strategy

When an enterprise formulates and implements a technological innovation strategy, it goes through three main stages: assessment, strategy selection and implementation. First, the assessment stage is the process of comprehensively evaluating the internal and external environment of the enterprise. By analyzing the strengths and weaknesses of competitors and the enterprise itself, the enterprise can more accurately grasp potential opportunities and provide basic support for subsequent decision-making. This stage requires comprehensive consideration of the external environment, such as policy support, economic trends, social demand and technological conditions, as well as internal resources, including capital, talent and technological capability. Second, in the strategy selection stage, enterprises need to choose the most suitable technological innovation strategy for themselves based on in-depth market research and internal conditions. Enterprises will combine their own resources and market positioning, and make trade-offs between independent innovation, imitative innovation and cooperative innovation [21]. Meanwhile, the choice of strategy should be flexible and sustainable in order to adapt to the needs of different stages of development. Finally, in the implementation stage,

the objectives of technological innovation strategy are translated into concrete and actionable plans. The core of this stage is to ensure that these plans can be effectively implemented. For example, enterprises need to promote the implementation of their strategies through rational organizational structure, financial and talent support [23]. Meanwhile, the implementation of innovation strategy is often accompanied by challenges, such as long R&D cycles, high patent barriers, or insufficient partner capabilities. Therefore, enterprises need to make dynamic adjustments during the implementation process to ensure that the strategy can continue to work.

3 Case Analysis of Xiaomi's Technological Innovation Strategy

3.1 Introduction of the Enterprise

Founded in 2010, Xiaomi initially made a rapid entry into the Chinese market with its direct Internet sales model and cost-effective phones. The reason for choosing Xiaomi as the research subject is that it is one of the fastest transforming Chinese technology companies in recent years and one of the most popular among young people. From its initial smartphones to its current coverage of smart home and even new energy vehicles, Xiaomi has made the leap from follower to strong competitor in the industry in less than 15 years. As shown in Fig.1, Xiaomi gradually expanded its business from smartphones to AIoT and new energy vehicles, and such a growth path is valuable to investigate.



Fig. 1. The Timeline of Xiaomi development

Xiaomi's growth relies on long-term technology accumulation. The company has strengthened its core competitiveness through patent layout and R&D investment, laying the foundation for its expansion in the fields of phone, smart home and new energy vehicles. Meanwhile, Xiaomi has a high-quality R&D team and maintains close ties with multiple technology partners. Such a mode of cooperation not only promotes the development of new products, but also helps to build a complete industry chain and enhance the overall innovation ability of the enterprise.

However, Xiaomi is also facing challenges in its rapid development. Despite its remarkable achievements in diversifying its layout, it still lacks maturity in some specific technology areas. The unbalanced development also means that Xiaomi needs to continue to broaden its business sectors and increase its investment in key core technologies to avoid being eliminated from future competition.

3.2 Feasibility Analysis of the External Environment

The feasibility analysis of the enterprise's external environment can be carried out from four aspects of PEST: policy, economy, society and technology. Firstly, at the policy level, China has given subsidies and R&D support to the new energy automobile industry, which creates favorable conditions for the technological innovation of enterprises. A favorable policy environment not only reduces the risk of enterprise innovation, but also provides institutional and financial protection, which makes the innovation strategy more feasible. Secondly, at the economic level, the market size of new energy vehicles is expanding, and the overall consumption potential is huge. For example, China's 2024 new energy vehicle sales have reached approximately 12.87 million units, with a year-on-year increase of approximately 35.5%; global new energy vehicle sales were approximately 17 million units in the same year, with a year-on-year increase of approximately 25%. As production value and sales continue to rise, the enterprises' innovation activities in this industry can be supported by a solid market, and the economic environment provides favorable growth space for innovation. Thirdly, at the social level, the public's concern for environmental protection and green development is growing, and social recognition of the new energy industry is gradually increasing. Consumers' acceptance of new energy vehicles is increasing. The social recognition provides positive support for the promotion and popularization of innovative products by enterprises. Finally, technological progress has provided a key impetus for the development of new energy vehicles. With the emergence of driverless technology, new energy and AI, enterprises can utilize advanced R&D in their innovation process to enhance competitiveness. However, it also means that enterprises must maintain continuous R&D investment to adapt to the rapidly changing technological environment. In summary, political support, economic potential, social recognition and technological progress provide good external conditions for the innovation strategy of the new energy automobile industry, which makes it possible for enterprises to have innovation in this field.

3.3 SWOT Analysis

Strength.

This article carries out an analysis based on SWOT, which includes strength, weakness, opportunity and threat. Xiaomi shows multiple advantages in technological innovation. As shown in Fig.2, Xiaomi's R&D investment and researcher scale have continuously increased in recent years, reflecting the company's emphasis on technological innovation. Firstly, Xiaomi has continued to increase its investment in R&D, forming a solid accumulation of technology. In 2023, Xiaomi's R&D expenses amounted to RMB 19 billion yuan, with more than 16,000 researchers. By mid-2025, the proportion of researchers has risen to 22,700, with a year-on-year increase of 38.2%. The trend shows Xiaomi's long-term investment in core technology areas, laying the foundation for its breakthroughs in smartphone, AI, the Internet of Things, and new energy vehicles. Secondly, Xiaomi has established a complete product and service ecology. With smartphone as the core, Xiaomi has gradually expanded to smart homes and new energy

vehicles, forming a strategic layout of "phone + AIoT + automobile". In the first half of 2025, the revenue of the AIoT business reached RMB 96.1 billion yuan, maintaining a double-digit growth, which fully demonstrates the competitiveness of its ecological integration in the market. The cross-border synergy not only enhances customer loyalty, but also provides a broader scene for the application of innovative achievements. Thirdly, Xiaomi has a unique advantage at the brand and market level. With its high cost performance and Internet direct marketing pattern, Xiaomi has won the favor of young consumers, especially young women. Its smartphones have a steady top five market share globally, and it has maintained a leading position in the Indian market for a long time. In the first half of 2025, Xiaomi's total revenue even increased by 38.2% year-on-year to RMB 227.2 billion yuan, which provides strong support for its brand influence and the commercialization of new technologies. Finally, the support of capital and talent provides guarantee for Xiaomi's innovation. Xiaomi not only has strong financial strength, but also attracts a large number of high-quality R&D teams and strategic partners. The success of new energy vehicles is an example. Xiaomi's latest financial data shows that Xiaomi's newly launched SU7 series delivered more than 92,000 units, demonstrating Xiaomi's ability to transform innovation into a new business growth point.

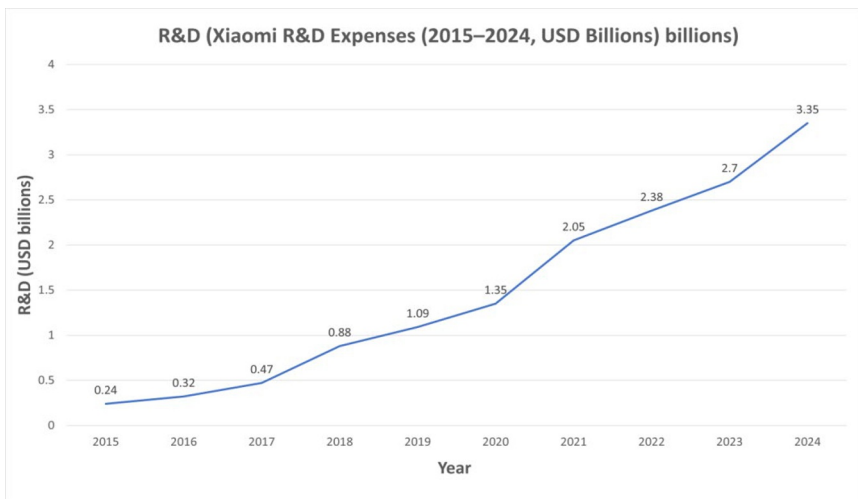


Fig. 2. Xiaomi R&D growing trend

Weakness.

Although Xiaomi has demonstrated strong innovation capabilities, it still has deficiencies in its R&D foundation, profitability, resource decentralization and internationalization. Firstly, compared with the international leading enterprises, Xiaomi's R&D foundation still has a gap. Although there is a certain amount of growth in R&D personnel, the financial report shows that the overall R&D investment has a certain gap compared with high-end rivals such as Apple and Huawei, which leads to Xiaomi's dependence on external cooperation in core technologies such as high-end chips and

operating systems. Secondly, Xiaomi's profitability is constrained by cost pressures. In the first half of 2025, the overall gross profit margin was only 21.7%, which was far lower than the level of Apple and other enterprises above 40%. Although the smartphone business has maintained a high shipment volume, but the average price of a single smartphone is limited, indicating that its brand premium capacity in the high-end market is insufficient, and it is difficult to break through the long-standing "cost-effective" positioning. Thirdly, in the process of cross-border, Xiaomi faces a huge challenge of resource fragmentation. Although the new energy automobile business has started rapidly, it is still in the investment period, which puts great pressure on capital and supply chain. The financial report shows that the automobile sector is facing huge costs in terms of R&D, production and marketing, and has not formed a stable profit share in the short term. Finally, Xiaomi faces potential risks in international markets. The company needs to deal with patent disputes and compliance requirements, especially in the European and U.S. markets, where lawsuits and regulatory risks may affect the long-term layout. These issues are also emphasized in the risk tips in the financial report, showing the vulnerability of the company in global expansion.

Opportunity.

The opportunity dimension can be summarized in the following four aspects. First, the policy environment gives the company good external conditions. China continues to support new energy vehicles, AI and green industries, and these policies can help Xiaomi reduce costs and risks in R&D and market expansion. Second, the rapid development of AI provides Xiaomi with a huge market space. In the first half of 2025, Xiaomi's AI business revenue has risen from RMB 6.4 billion yuan to RMB 39.8 billion yuan, with an increase of more than 500%. It indicates that consumer and market demand for AI products is exploding, and Xiaomi has the opportunity to expand its competitive advantage by applying AI to phones, homes and cars. Third, the new energy vehicle market is growing rapidly. Xiaomi SU7 series delivered more than 92,000 units in the first half of 2025, becoming a key leader in the new energy industry in China. In the future, as consumers' recognition of green travel improves, Xiaomi is expected to continue to expand in the automotive field. Finally, the international market is still a vast opportunity. Although Xiaomi faces challenges in the European and American markets, but in India, Southeast Asia and Latin America and other markets, Xiaomi's phones are still very competitive.

Threats.

The threats can be summarized in the following four aspects. First, the market competition is very fierce. In the field of smartphones, Apple, Huawei and Samsung have obvious advantages in the high-end market; in the field of new energy vehicles, BYD, Tesla and other enterprises have invested a lot, and Xiaomi is under great pressure to stand firm in the long term. Secondly, the speed of technological iteration is fast. AI, big models, chips and other updates have a short cycle. If Xiaomi can't keep up in R&D, it may be quickly eliminated from the market. The characteristics of the industry of

"fast-in and fast-out" require accelerated innovation. Third, the global market environment is full of uncertainties. Xiaomi has to face patent disputes, compliance requirements and potential lawsuits in the European and U.S. markets, which will add additional costs and risks. Meanwhile, changes in the international situation and trade policies may also affect the supply chain and market layout. Finally, although the new energy vehicle business is growing rapidly, it is still at a high investment stage. The industry is faced with fluctuations in raw material prices, uncertainty of breakthroughs in battery technology, and a reduction in policy subsidies in the future, all of which will put pressure on Xiaomi.

3.4 Strategic Choice

Based on the previous analysis of internal and external strengths and weaknesses, external opportunities and threats, it can be found that Xiaomi has strong innovation potential and development space. In terms of strategic choices, Xiaomi should take independent R&D as the focus and collaborative innovation as the supplement.

First of all, by strengthening its R&D investment in key areas such as AI, chips, and new energy vehicles, Xiaomi can gradually get rid of its dependence on external sources in core technology and shape a long-term competitive barrier. Meanwhile, Xiaomi should also actively collaborate with universities, research institutions and upstream and downstream partners in the industry chain for collaborative innovation. Through resource sharing and cross-border cooperation, it can not only shorten the technology cycle, but also better cope with professional barriers and a series of challenges in the global layout.

In summary, Xiaomi's technological innovation strategy should adhere to the mode of "taking independent R&D as the focus and collaborative innovation as the supplement". In new energy and other strategic emerging industries, Xiaomi should continue to improve the accumulation of technology and product competitiveness, and gradually form a differentiated advantage, so as to achieve long-term sustainable development goals.

3.5 Strategic Program

In order to further enhance its technological innovation capability, Xiaomi can adopt differentiated optimization in both short-term and long-term strategies. In the short term, the company should increase resource investment, especially increase R&D funding and experimental platform construction, and actively introduce more high-quality research talents to enhance the overall strength of the R&D team. In the long term, Xiaomi needs to establish a leading position in innovation on a global scale. It includes continuously promoting independent research and development of core technologies and gradually breaking through the limitations of high-end chips, operating systems and other key aspects. Meanwhile, the company should proactively address patent and compliance issues in the course of internationalization, and establish a mechanism for responding to intellectual property protection and industry rules in line with international standards to ensure the robustness of its global expansion.

In summary, Xiaomi's strategic program should adhere to the route of "short-term intensive investment and long-term innovation leadership". It will not only help consolidate its competitive advantage in the domestic market, but also lay a more solid foundation for its international development.

4 Conclusion

This study analyzed Xiaomi's external environment and internal conditions to identify its main opportunities and challenges in technological innovation. The analysis shows that policy support, economic potential, social recognition, and technological advancement have provided favorable conditions for innovation. However, compliance issues and patent barriers in international markets still create uncertainty. The SWOT analysis indicates that Xiaomi possesses clear strengths and opportunities in research investment, product ecosystem, and market share. At the same time, it faces weaknesses such as gaps in high-end technology and limited profitability. Therefore, Xiaomi should continue to focus on independent research and development while fostering cooperative innovation, particularly in emerging fields such as electric vehicles and artificial intelligence. In the short term, Xiaomi needs to increase resource investment and attract professional talent. In the long term, it should strive for technological leadership and steady international expansion. Overall, Xiaomi's strengths and opportunities outweigh its weaknesses and threats. With continued progress in core technologies and the development of a premium brand image, the company is likely to achieve a stronger position in the global technology landscape.

The conclusions drawn from this study also offer insights for other technology companies. When formulating innovation strategies, firms should fully consider both internal and external environments, leverage their strengths, address existing gaps, and align short-term actions with long-term objectives to achieve sustainable growth.

References

1. Azar, G., & Ciabuschi, F. (2017). Organizational innovation, technological innovation, and export performance: The effects of innovation radicalness and extensiveness. *International business review*, 26(2), 324-336.
2. Roper, S., & Love, J. H. (2002). Innovation and export performance: evidence from the UK and German manufacturing plants. *Research policy*, 31(7), 1087-1102.
3. Zhang, K. H. (2024). Geoeconomics of US-China tech rivalry and industrial policy. *Asia and the Global Economy*, 4(2), 100098.
4. Autor, D. H., Dorn, D., & Hanson, G. H. (2013). The China syndrome: Local labor market effects of import competition in the United States. *American economic review*, 103(6), 2121-2168.
5. Min, S., Kim, J., & Sawng, Y. W. (2020). The effect of innovation network size and public R&D investment on regional innovation efficiency. *Technological Forecasting and Social Change*, 155, 119998.
6. Baldwin, C. Y., Bogers, M. L., Kapoor, R., & West, J. (2024). Focusing the ecosystem lens on innovation studies. *Research Policy*, 53(3), 104949.

7. Hamidi, S., Zandiatashbar, A., & Bonakdar, A. (2019). The relationship between regional compactness and regional innovation capacity (RIC): Empirical evidence from a national study. *Technological Forecasting and Social Change*, 142, 394-402.
8. Zabala-Iturriagagoitia, J. M., Aparicio, J., Ortiz, L., Carayannis, E. G., & Grigoroudis, E. (2021). The productivity of national innovation systems in Europe: Catching up or falling behind?. *Technovation*, 102, 102215.
9. Lin, Y., & Wu, L. Y. (2014). Exploring the role of dynamic capabilities in firm performance under the resource-based view framework. *Journal of business research*, 67(3), 407-413.
10. García-Avilés, J. A. (2020). Diffusion of innovation. *The international Encyclopedia of media psychology*, 1(8), 1-8.
11. O'Dwyer, M., Filieri, R., & O'Malley, L. (2023). Establishing successful university-industry collaborations: barriers and enablers deconstructed. *The Journal of Technology Transfer*, 48(3), 900-931.
12. Zhang, X., Chu, Z., Ren, L., & Xing, J. (2023). Open innovation and sustainable competitive advantage: The role of organizational learning. *Technological forecasting and social change*, 186, 122114.
13. Adegbile, A. S., Sarpong, D., & Cao, D. (2021). Industry-university collaborations in emerging economies: A legitimacy perspective. *IEEE Transactions on Engineering Management*, 70(7), 2381-2393.
14. Hervás-Oliver, J. L., Sempere-Ripoll, F., & Boronat-Moll, C. (2021). Technological innovation typologies and open innovation in SMEs: Beyond internal and external sources of knowledge. *Technological Forecasting and Social Change*, 162, 120338.
15. Zhou, S., & Peng, F. (2023). The impact of technology transfer on the green innovation efficiency of Chinese high-tech industry. *Frontiers in Sociology*, 8, 1141616.
16. Crossan, M. M., & Apaydin, M. (2010). A multi-dimensional framework of organizational innovation: A systematic review of the literature. *Journal of management studies*, 47(6), 1154-1191.
17. Ghobakhloo, M., Iranmanesh, M., Grybauskas, A., Vilkas, M., & Petraitė, M. (2021). Industry 4.0, innovation, and sustainable development: A systematic review and a roadmap to sustainable innovation. *Business Strategy and the Environment*, 30(8), 4237-4257.
18. Teece, D. J. (2018). Profiting from innovation in the digital economy: Enabling technologies, standards, and licensing models in the wireless world. *Research policy*, 47(8), 1367-1387.
19. Wu, N., & Liu, Z. (2021). Higher education development, technological innovation and industrial structure upgrade. *Technological Forecasting and Social Change*, 162, 120400.
20. Hu, A. G., & Jefferson, G. H. (2009). A great wall of patents: What is behind China's recent patent explosion?. *Journal of Development Economics*, 90(1), 57-68.
21. Ćirović, D., Dabić, M., Melović, B., & Backović, T. (2025). Unleashing SME innovation in small open economies: the strategic role of market dynamism, R&D, and organizational capabilities. *Review of Managerial Science*, 1-37.
22. Pandey, N., de Coninck, H., & Sagar, A. D. (2022). Beyond technology transfer: Innovation cooperation to advance sustainable development in developing countries. *Wiley Interdisciplinary Reviews: Energy and Environment*, 11(2), e422.
23. Teece, D. J. (2014). The foundations of enterprise performance: Dynamic and ordinary capabilities in an (economic) theory of firms. *Academy of management perspectives*, 28(4), 328-352.

Open Access This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

