

A Study on English-Chinese Translation Strategies for Interdisciplinary Scientific and Technical Terms

WANG Zige, GAO Jun

University of Shanghai for Science and Technology, Shanghai, China

Terminology translation constitutes a core issue in scientific and technical translation. Taking the PNAS feature article *Genomic Ancestry, Behavior, and the Domestication of the Dog* as an example, this paper classifies 120 scientific and technical terms in the article into four types, i.e., technical terms, species, and breed names, metaphorical terms, and abbreviations. It analyzes the E-C translation strategies applicable to each type. It is found that the translation of technical terms should adhere to authoritative standards and follow the principles of monosemy and systematicity, species and breed names requires a balance between biological naming conventions and established common usage, metaphorical terms demands a proper balance between rhetorical vividness and academic rigor, while abbreviations calls for a graded strategy based on cognitive recognition. This study provides practical reference for terminology translation in interdisciplinary scientific and technical texts.

Keywords: science and technology, terms, translation strategies

Introduction

Terminology translation constitutes the core of scientific and technical translation and therefore attracts the attention of many scholars. Feng (2011) claimed that systematicity and monosemy are fundamental principles for terminology translation and emphasized that terms must maintain consistent meanings and conceptual connotations within a specific disciplinary system. Jiang (2005) put forward three criteria, including accuracy, readability, and transparency, which take precise matching of professional connotations as the top priority while conforming to Chinese academic writing conventions and conceptual traceability and offering operational guidance for term translation in scientific and technical texts. Wang (2005) summarized 12 rules for English-Chinese scientific and technical term designation, such as literal translation first, classic-referenced principle, and standard-based principle.

Against the backdrop of interdisciplinary integration, terminology research confined to single disciplines can hardly meet the translation demands of cross-disciplinary texts. Lu (2025) argued that terminology translation principles should be adjusted to disciplinary attributes, target readership, and communication scenarios, highlighting the integration of standardization and flexibility. Leng (2025) also pointed out that terms in interdisciplinary contexts present diverse word forms and extended semantic meanings, requiring translators to accurately define their conceptual connotations in specific contexts.

However, most existing studies focus on terminology standardization within a single discipline and lack

effective solutions to problems such as interdisciplinary term overlap and ambiguous conceptual boundaries (Hou, 2009; Liu & Huang, 2003; Shao, 2021). Taking the Chinese version of the interdisciplinary research article *Genomic Ancestry, Behavior, and the Domestication of the Dog* (Lord et al., 2025) on canine domestication published in *PNAS*¹ as an example, this paper aims to discuss the translation strategies for interdisciplinary scientific and technical terms. The reason why we select this article is that the term density is very high, accounting for 11.6%, and the terms span multiple fields, including genetics, behavioral science, archaeology, and genomics. In addition, some metaphorical terms and abbreviations also appear in the article.

Classification of Interdisciplinary Scientific and Technical Terms

We classify the terms into four types: technical terms, species and breed names, metaphorical terms, and abbreviations.

Technical terms are those in different disciplines, such as genetics, behavioral science, archaeology, and genomics. Examples include “genetic basis,” “phenotype,” “lineage,” and “genomic ancestry.” Terms of this category possess clear and precise conceptual definitions, making them the primary focus of terminology standardization research.

Species and breed names include Latin biological names, such as “*Canis familiaris*” and “*Canis lupus*,” canine breed names, such as “German Shepherd” and “Golden Retriever,” as well as special population designations, such as “village dog” and “dingo.” Such terms are closely related to biological taxonomy and industrial kennel naming conventions.

Metaphorical terms are figurative rhetorical expressions employed to illustrate abstract scientific concepts. They can enrich academic narration, clarify intangible professional implications, and boost textual expressive effect, while maintaining the academic rigor inherent in scientific writing. Typical examples include “poster child,” “kaleidoscope of issues,” “genomic turnover,” and “Tree of Life.”

Abbreviations are condensed lexical forms of technical terminologies, institutional titles and research methods. They are primarily used to simplify academic writing, avoid redundant repetition, and enhance reading fluency as well as the efficiency of information delivery in scholarly discourse. Common examples include “DNA,” “MIT,” “PNAS,” “GWAS,” “GRLS,” and “SNP.”

E-C Translation Strategies for Interdisciplinary Scientific and Technical Terms

Standardization and Consistency

To ensure accuracy and disciplinary coherence in translating technical terms across interdisciplinary texts, translators must adopt a strategy of strict standardization and consistency. Standardization is required, because such terms carry fixed disciplinary definitions, and non-standard expressions would violate academic norms and mislead professional readers. Therefore, translators must strictly follow officially approved Chinese equivalents issued by the China National Committee for Terms in Science and Technology to maintain conceptual unity across disciplines. Consistency is equally essential because technical terms often form a logically interconnected conceptual network within interdisciplinary research. Inconsistent term rendering may blur conceptual

¹ *PNAS* (*Proceedings of the National Academy of Sciences of the United States of America*) is a comprehensive scientific journal officially published by the National Academy of Sciences of the United States. It was founded in 1914 and is one of the top international academic journals.

boundaries and hinder academic understanding and academic communication.

Take the term “admixture” as an example. Although it is closely related to “introgression,” the two terms carry distinct connotations. “Admixture” denotes the process and resulting state of gene pool fusion between two or more populations. Multiple Chinese translations exist in Chinese academic circles, including “混合,” “混杂,” and “遗传混合.” Proceeding from the conceptual system, this paper adopts “遗传混合” (genetic admixture) as the preferred translation. This choice not only avoids the possible negative connotation of “混杂,” but also establishes a clear conceptual distinction from “基因渗入” (introgression). Similarly, gene flow is translated as “基因流” (gene flow), which forms a hyponymous relationship with “基因渗入” (introgression).

Taxonomic Norms and Reader Acceptability

Taxonomic norms must be applied, because such terms are governed by fixed biological classification rules and industry conventions. Meanwhile, reader acceptability is essential because specialized or newly emerging terms may lack standardized Chinese equivalents. A balance between precision and readability is therefore required to eliminate misunderstanding and facilitate comprehension.

Taking “*Canis familiaris*” as an example, it retains its Latin form, and “狗” or “家犬” is used as the proper Chinese expression in specific contexts. Breed names should follow the official versions from authoritative kennel organizations. For “German Shepherd,” the study adopts the standard CKU² translation “德国牧羊犬.” Similarly, “Golden Retriever” and “Boxer” are translated as “金毛寻回犬” and “德国拳师犬.” All these choices follow the unified naming rules in the canine industry. Taking “village dog” as another example, it refers to “non-breed dog populations around the world that are not under strong human selection.” The original text emphasizes its high research value. Given its high research value and the absence of an authoritative standardized translation, this paper adopts “村庄犬” and adds supplementary explanation at its first occurrence. This method ensures term consistency and improves reader understanding at the same time. Similarly, “dingo” is translated as “澳洲野犬” instead of “澳洲野狗.” This choice highlights its unique taxonomic status as a feral subspecies³.

Image retention and Academic Functional Adaptation

For metaphorical terms with established and widely recognized Chinese translations, translators should adopt the strategy of image retention, preserving original rhetorical connotations while ensuring academic accuracy. For metaphorical terms without fixed authoritative renderings, academic functional adaptation is more appropriate. Literal translation may cause semantic confusion, while excessive free translation will weaken academic solemnity. The combination of the two strategies can ensure conceptual clarity and conform to formal academic writing norms.

“Tree of Life” is a widely used metaphor in biology. It represents the evolutionary relationship among all living things. The translation “生命之树” has been widely accepted in Chinese biological research. It keeps the core image of “tree” and conveys accurate disciplinary meaning at the same time. Similarly, “semi-permeable” is originally a physics term. It is used metaphorically to describe species boundaries that allow partial gene flow. It is translated as “半渗透性的,” which preserves the original physical imagery and fits

² The China Kennel Union (CKU) is the authorized Chinese member organization of the Fédération Cynologique Internationale (FCI), with its headquarters in Beijing.

³ In biological classification, subspecies refer to “populations within the same species that exhibit certain morphological, genetic, or other differences due to geographic isolation or ecological divergence, while still being capable of interbreeding and producing fertile offspring.”

naturally into the biological research context. Academic functional adaptation requires a balance between academic seriousness and expression vividness. For example, “poster child” originally means a child appearing on posters. It is used metaphorically to show that the dog is a typical example in domestication research. A literal translation “海报儿童” will cause confusion. Excessively free translation “标杆” will reduce its rhetorical effect. We choose “经典案例” as the proper version. This version gives up part of the literal image but ensures conceptual clarity and formal academic style, which meets the objective requirement of scientific papers. Similarly, “genomic turnover” describes large-scale genomic replacement in a vivid way. The translation “基因组更替” retains the dynamic meaning of the original word and defines the conceptual scope with the term “基因组。”

Hierarchical Recognition and First-occurrence Expansion

To ensure readability and efficient knowledge transmission when translating abbreviations, translators should implement a strategy based on hierarchical recognition and first-occurrence expansion. Differentiated treatment according to cognitive hierarchy is needed because abbreviations vary widely in reader familiarity; uniform handling would either cause unnecessary redundancy or create reading barriers. Requiring full expansion at first occurrence is essential, because it clarifies term meaning, anchors the abbreviation in readers’ memory, and supports smooth information retrieval throughout the text.

Hierarchical recognition means different treatment methods according to the recognition level among target readers. Three levels can be divided. High-recognition abbreviations, such as “DNA” and “MIT” are widely known in professional fields and can be used directly. Medium-recognition abbreviations, such as “GWAS” and “PNAS” are common in related fields and need full-name expression at first occurrence. Low-recognition abbreviations, such as “GRLS” and “CBARQ” are unique to certain studies and have low public recognition, so alternate use of full names and abbreviations is recommended throughout the text.

“GWAS” is a common research method in genetics. The original text gives its full name “Genome-Wide Association Studies” when it first appears. Following common academic practice, the Chinese translation uses the full term plus abbreviation “全基因组关联分析 (GWAS)” at first occurrence and only the abbreviation in later text. For “GRLS,” a special project abbreviation with low recognition, the original text mentions “the Golden Retriever Lifetime Study (GRLS).” The Chinese translation uses the same structure “金毛寻回犬终身研究 (GRLS)” at first occurrence. Alternating between full names and abbreviations in subsequent reading can effectively prevent reading barriers.

Conclusion

This study focuses on English-Chinese translation strategies for interdisciplinary scientific and technical terms, using the PNAS paper *Genomic Ancestry, Behavior, and the Domestication of the Dog* as a case study. It classifies 120 terms from the text into four types: technical terms, species and breed names, metaphorical terms, and abbreviations. The research proposes targeted translation strategies for each category by balancing standardization, academic norms, rhetorical appropriateness, and reader acceptance. It also addresses the gaps in existing single-discipline terminology research and provides feasible operation for term translation in interdisciplinary scientific and technical texts.

References

- Feng, Z. W. (2011). *An introduction to modern terminology*. The Commercial Press.
- Hou, G. J. (2009). The systematic-identifiability principle for linguistic terminology translation—Commentary on Jiang (2005). *Shanghai Journal of Translators*, 2, 69-73.
- Jiang, W. Q. (2005). On criteria for terminology translation. *Shanghai Journal of Translators*, 51, 80-84.
- Leng, B. B. (2025). *Usage characteristics and translation strategies of English terms for new materials*. Research Report of China National Committee for Terms in Sciences and Technologies.
- Liu, Q., & Huang, Z. H. (2003). Essential characteristics of scientific and technical terms. *Journal of China Terminology*, 1, 22-26.
- Lord, K. A., Larson, G., Murphy, W. J., & Ostrander, E. A. (2025). Genomic ancestry, behavior, and the domestication of the dog. *Proceedings of the National Academy of Sciences*, 122(48), e2528616122.
- Lu, H. G. (2025). A multidimensional study of terminology translation principles under standardization orientation. *Journal of China Terminology*, 27(5), 24-29.
- Shao, J. H. (2021). Principles and application of terminology translation. *Shanghai Journal of Translators*, 6, 39-43.
- Wang, Y. Z. (2005). Rules for term designation in English-Chinese scientific and technical translation. *Journal of China Terminology*, 4, 10-15.
- Zhao, S. Y. (2006). *Chinese terms in genetics* (2nd ed.). Science Press.