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КУРСОВА РОБОТА
З ПЕРЕКЛАДУ

**Лексико-семантичні і стилістичні проблеми перекладу науково-технічних
текстів з англійської мови на українську (на матеріалі текстів у галузі
біотехнологій)**

групи

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INTRODUCTION

Relevance of the Research Topic: The modern world is rapidly evolving, leading to a continuous increase in scientific and technical information. A significant portion of this information is published in English, making the translation of scientific and technical texts from English to Ukrainian an increasingly relevant task.

The translation of scientific and technical texts differs from the translation of other types of texts due to the specificity of vocabulary, grammar, and style. Incorrect translation of scientific and technical texts can distort information, which can have negative consequences in various fields such as medicine, engineering, information technology, and others.

Research Objective: To study the lexical-semantic and stylistic issues of translating scientific and technical texts from English to Ukrainian (based on materials in the field of biotechnology).

Research Tasks:

- Analyze the lexical-semantic features of scientific and technical texts in the field of biotechnology.
- Investigate the theoretical aspects of translating phraseological units and expressions.
- Study the specifics of translation in the field of biotechnology.
- Analyze lexical transformations in the translation of phraseological units.
- Examine grammatical transformations in the translation of scientific and technical texts.
- Describe lexical and grammatical transformations in the translation of scientific and technical texts.

Research Object: Scientific and technical texts in English in the field of biotechnology.

Research Subject: Lexical-semantic and stylistic issues of translating scientific and technical texts from English to Ukrainian.

Research Methods:

- Literature analysis.
- Comparative analysis.
- Content analysis.

Scientific Novelty of the Research: It lies in the comprehensive study of lexical-semantic and stylistic issues in translating scientific and technical texts from English to Ukrainian (based on materials in the field of biotechnology).

Practical Significance of the Research: The results of the research can be used for:

- Improving the quality of translation of scientific and technical texts.
- Developing educational courses on the translation of scientific and technical texts.
- Creating dictionaries and glossaries of scientific and technical terminology.

Structure of the Work: The work consists of an introduction, two chapters, conclusions, a list of used sources, a list of reference sources, a list of data sources, and an appendix.

CHAPTER 1

CHAPTER 1 LEXICO-SEMANTIC PROBLEMS OF TRANSLATION IN SCIENTIFIC AND TECHNICAL TEXTS

1.1 Lexico-semantic features of scientific and technical texts

The scientific style, i.e., the style of scientific communications, serves to inform about phenomena, explain their causes, report the conditions of their existence, describe essential features and properties of objects of scientific cognition, describe laws, reveal regularities, describe discoveries, teach, etc. Its main features are strict objectivity of presentation, clarity of definitions, and laconic form. Abstractness, generalization, and pronounced logical coherence are characteristic of the scientific style, that is, strict sequence, clear connection between the main idea and details, interrelation of all elements of communication, and clarity of presentation. Not all of these characteristics are studied solely by linguistic science; some of them lie at the intersection of various sciences, such as logic and philosophy [1].

The semantic precision and clarity (unambiguity) of expressing thoughts, informative richness (content), absence of imagery and emotionalism are the main stylistic features of scientific (scientific-technical) texts. To avoid arbitrary interpretation of the essence of the topic being presented, artistic expressiveness, which lends emotional coloring to language, is almost completely absent in scientific-technical texts. This primarily concerns tropes such as metaphors, metonymies, hyperboles, litotes, allegories, etc., which are widely used in literary fiction and spoken language. However, it should be noted that the use of specialized phraseology is characteristic of scientific-technical literature to some extent. This includes cases where a commonly used word, which is part of a specific collocation, acquires a terminological meaning. For example:

- worm gear
- electric eye
- dual personality
- railway branch

- atmospheric disturbance
- Active (Passive) Voice, etc [2].

The use of specialized phraseology to some extent adds liveliness to scientific-technical texts, removing unnecessary dryness. All these characteristic features of scientific communication are associated with the specificity of scientific thinking. In this regard, the scientific style is contrasted with the language of literary fiction, everyday or colloquial language, and other linguistic styles. The main form of realization of the scientific style is written monological language. However, with the increasing role of science in various fields of activity, the expansion of scientific contacts, and the development of mass communication tools, the role of oral communication using the scientific style is also growing [3].

Scientific-technical literature includes the following types of texts:

- scientific-technical literature proper, i.e., monographs, articles, collections of articles on various scientific and technical issues, dissertations, abstracts, scientific reports, theses, scientific communications, lectures, reviews;
- educational literature on technical sciences (textbooks, manuals, guides, educational and methodological literature, etc.);
- patent literature/documentation;
- popular science literature on various technical fields;
- technical and accompanying documentation;
- technical advertising.

Among the various types of scientific-technical literature, patent literature significantly stands out for its peculiarity. Firstly, patents descriptions are characterized by a rigid standardized form, and secondly, the language of patent descriptions combines the characteristics of two styles: scientific-technical and official-business.

Translating patents can indeed pose certain difficulties. The main characteristic of scientific-technical literature is that it is intended for scientists, researchers, and professionals in a particular field of knowledge. However, scientific communications can

also target graduate students, undergraduates, pupils, and anyone interested in a specific scientific area.

As mentioned earlier, texts in the scientific style are characterized by clearly defined features, which they possess to varying degrees. In all texts, the linguistic means used must meet the requirements of professional communication in a particular field. Lexico-semantic features, primarily the use of terminology and other specialized vocabulary, are crucial in this regard [4].

The main feature of scientific-technical texts is the presence of a large number of technical terms. Besides being rich in terms and terminological phrases, specialized texts are distinguished by many other specific lexico-semantic units, such as realities, neologisms, clichés, internationalisms, and pseudo-internationalisms, proper names, various abbreviations and acronyms, including letter terms, and so on.

A term or terminological phrase is a precise designation of a general scientific concept or a concept in a specific field of science and technology. The characteristics of terms include accuracy, specificity, independence from context, and lack of emotional connotations. It is considered that the main property of a term is unambiguity, i.e., having only one meaning. However, from a linguistic perspective, terms, like other words, can have multiple meanings. For example, the word "treatment" can refer to cladding/covering in construction, chemical, biological, or thermal processing in relevant scientific fields, therapy/treatment in medicine, enrichment (ore, coal) in mining, rehabilitation of offenders in jurisprudence, etc. Such cases pose special challenges for precise understanding, and only context can help reveal the meaning of a polysemous term in each specific case [5].

Scientific-technical terminology can be classified into several groups:

1. Commonly used words that, besides their primary meanings, have specific terminological meanings in a particular field of science or technology, a phenomenon known as terminologization.

2. General technical or scientific terms with different terminological meanings in various fields.

3. Specialized terms belonging exclusively to one field, e.g., in construction – mortar, cement, clay, brick; in radio engineering – antenna; in economics – overproduction, etc.

4. Narrowly specialized terms, such as in electrical engineering – circuit, plug; in biology – metabolism, etc.

In terms of their structure, technical terms can be divided into:

1. Simple terms, e.g., resistance, landscape, installation, technology, discharge, layout, territory, standard, filter, terminology.

2. Compound terms formed by compounding, e.g., voltmeter, windmill, drawbridge, atombomb, greenhouse effect, motorway, pipeline.

3. Phrases where one component determines the other, e.g., high-frequency mode, water treatment, waste water treatment, answering machine, building materials, urban planning.

4. Abbreviations and acronyms, such as 3-D, a.c., RPM, dc generator, F, TA, LDC, IC, POP.

5. Acronyms, i.e., component abbreviations that have become independent words, e.g., radar, laser, BASIC.

6. Letter terms, where an English alphabet letter corresponds graphically to the essence of the term, e.g., T-antenna, V-belt, X-rays.

In translation, context plays a crucial role in determining the exact meaning of a term. Polysemous terms, homonyms, and specialized lexicon nuances require translators to have a deep understanding of both languages and the subject matter to ensure accurate and precise translation.

Professionally-oriented or professional and specialized texts are designed for a specific group of experts in a particular field of knowledge. These texts contain

information that is relevant to the profession and facilitates the exchange of professional knowledge. The primary functions of such texts include:

1. Denotative function: reporting facts.
2. Commanding or volitional function: prescribing actions.
3. Metalinguistic function: describing the linguistic system concerning language use.

The tone of these texts is typically neutral or adjusted to a business tone. The information found in such texts can be categorized into:

1. Cognitive information: objective details about the external world, characterized by objectivity, abstractness, and density or compressibility.
2. Prompt or appealing information: inciting or calling for specific actions, as seen in instructions or proclamations.
3. Emotional information: conveying emotions and feelings, although less frequently than in other text types.

Special texts are characterized by their informativeness, consistency, accuracy, clarity, and comprehensibility. These texts may exhibit these features to varying degrees. The predominant use of language tools in these texts aligns with the specific communication needs of the field.

The translation of professional texts, especially in English, poses significant challenges in terms of comprehension and translation due to their rich linguistic content. Correctly interpreting the linguistic elements in these texts is crucial for accurate translation. Specialized translation requires specific skills and knowledge from translators as the quality of the translation directly impacts the work of specialists studying the scientific content.

Specialized translation encompasses four types corresponding to functional styles:

1. Official texts (diplomatic, legal, military, commercial, etc.).
2. Scientific and technical texts (across various scientific areas).
3. Journalistic texts (aimed at influencing people through media).

4. Everyday communication texts (colloquial and vernacular vocabulary).

While professional texts are often perceived as concise and monotonous with accurate and standardized terminology, they can also be sophisticated and vivid, resembling literary texts. Translating such texts is more time-consuming but offers an engaging translation practice. The structural differences between languages and the genre diversity within the scientific and technical style contribute to the richness and complexity of these texts.

For any professional text to be accurately translated, translators must fully understand it and have a grasp of the scientific field it pertains to. This understanding includes recognizing the relationships between terms and their context to unveil the intended meaning of each lexical unit. The primary objective when translating multidisciplinary texts is to convey the meaning of complex terms effectively, as they are pivotal in professional discourse [6].

To better understand scientific and technical texts, it's important to have a good grasp of the subject matter and its related English terminology, as well as an understanding of the characteristics of scientific and technical writing style. Additionally, for an accurate translation of the content into one's native language, it's necessary to be familiar with the corresponding terminology in the native language and to have a strong command of the native literary language. However, the main challenges usually arise not from translating individual terms, which can often be found in terminological dictionaries (and nowadays, with the help of modern information technologies), but from comprehending the meaning of phrases or sentences.

1.2 Theoretical aspects of translating scientific and technical texts

The translation of idiomatic expressions and phrases is a purposeful linguistic-psycho-mental activity of the translator as a recreational system, which combines two phases in a single transformative process: the interpretation of the original text and the generation of a translation text based on this interpretation. In this process, the first phase involves the "reflexive understanding by the translator of the world of meanings of the

addressee of the original text, its interpretation program for the reader of the original, the degree of value of textual information, and its correlation with the original culture and existence. The second phase is the comparison of the internally expressed reflection of the translator with the code of another language considering the universe of another culture and the internalized existence of another ethnic group [7].

Translation is a form of linguistic mediation that is entirely oriented towards the original. Translation is a foreign language form of existence of a message containing the original. The task of translation is to ensure such a level of intercultural communication where the text created in the recipient language could function as a fully communicative substitute for the original and could be identified by the recipients of the translation with the original in functional, structural, and content-related relations [8].

The main problems of modern translation studies include: the development of concepts of equivalence, establishing types of equivalence and factors of their balance in translation, defining translation strategies, analyzing means of pragmatic adaptation in translation, identifying and classifying translation errors, means of compensating for gaps, and so on. To solve these tasks, translation studies use general linguistic methods and create their own: transformational and distributional analysis, hermeneutic method (the method of interpreting the deep meaning of texts and their translations through the study of the structure and semiotic nature of language, studying historical, philosophical, religious, and other data related to a specific type of literary work) [7].

Any translation performs both informational and creative functions. In the case of translating idiomatic expressions, creativity plays a crucial role. Background knowledge of the translator is important, as without erudition and sufficient knowledge in various areas of human life, it is impossible to achieve adequacy in translating fixed expressions. An adequate translation is the reproduction of the unity of content and form of the original using the means of another language. Adequate translation takes into account both content and pragmatic equivalence, does not violate any norms, is precise, and avoids any unacceptable distortions of content. Adequate translation is evaluative and involves the

concept of the completeness of the translation, which consists of creating functional equivalents in the language of translation and implies a balance between content and form. Literal translation of individual elements cannot be considered a complete translation of the whole [9].

To achieve maximum adequacy when translating idiomatic expressions from English to Ukrainian, the translator must be able to use various types of translation:

1. Equivalent: an adequate idiomatic expression existing in Ukrainian that coincides with the English one in meaning and imagery.

2. Analogue: a Ukrainian fixed phrase that is equivalent in meaning to the English one but may differ in imagery either partially or completely.

3. Descriptive translation: conveying the sense of the English expression using free word combinations. This is applied when there are no equivalents or analogues in Ukrainian.

4. Antonymous translation: conveying negative meaning using affirmative constructions or vice versa.

5. Calque: used when the translator wants to highlight the imagery of the idiom or when the English expression cannot be translated using other methods.

6. Combined translation: in cases where the Ukrainian analogue does not fully convey the meaning of the English idiom or has a different specific coloration of place and time, a calqued translation is provided, followed by a descriptive translation and a Ukrainian analogue for comparison.

When translating fixed word combinations, it is important to accurately reproduce their semantic function and stylistic coloration. The methodological basis for most works dedicated to translating such units is the principle of the presence or absence of equivalents to fixed word combinations in the target language.

Equivalents can be absolute or relative. Absolute equivalents of fixed word combinations coincide with the original in all aspects: grammatical, lexical, and stylistic. Relative equivalents of fixed word combinations that fully match the original in meaning

and stylistic marking have some differences from the original. These differences can be grammatical (number category, word order, etc.) or lexical [10].

In the process of familiarizing oneself with idiomatic expressions, various methods of semanticization can be used: translational and non-translational. Translational methods of revealing the meanings of English idiomatic units include: single-word translation, multi-word translation, phrase translation, explanation or clarification of the idiom in the native language. Non-translational methods of revealing the meanings of English idiomatic units include: visual semanticization - demonstrating pictures, images, gestures; linguistic semanticization - using context, illustrative sentences, comparing one idiom with another previously known idiom; definition - describing the meaning of the idiomatic expression using already known words [11].

We share the opinion of scholars regarding the main types of idiom translation:

1. Literal (word-for-word corresponds to the source language; absolutely accurate, literal). This is a kind of apt expression that succinctly and figuratively conveys the thought and becomes widely used. For example, "time is money" - час - це гроші.

During the study of idiomatic units in English language classes with university students, it is worth emphasizing that this method can be applied when, as a result of calque, we get an expression whose imagery is easily perceived by Ukrainian readers and does not create an impression of inconsistency with the generally accepted norms of the Ukrainian language. Sometimes, in literal translation of an English idiom, insert words are used: as they say, as they say, emphasizing that the idiom is translated literally. Literal translation does not use ready-made idioms that exist in the target language but creates a new figurative expression unfamiliar to the native language, although understandable [15].

Equivalent-Incomplete. This method involves searching for a corresponding equivalent phrase in the target language with the same meaning but a different internal form [12]. For example:

- "to jump down someone's throat" - перебити, «заткнути рота»

- "put by for rainy day" - відкласти на чорний день
- "break the ice" - розрядити атмосферу
- "fire questions at sb" - «закидати» когось запитаннями [13].

Our practical experience in translating phraseological units shows that the number of figurative idioms that coincide in meaning and imagery in English and Ukrainian is relatively small. Much more often, there is a need to use a Ukrainian phraseological unit that is analogous in meaning to the English one but has a different underlying imagery.

Descriptive. Descriptive translation is used in cases where the above-mentioned methods are not possible, but it eliminates uniqueness, imagery, and emotionality. For example:

- "dark horse" - невідомий раніше кандидат
- "piece of cake" - щось дуже просте, що не вимагає зусиль
- "crunch time" - найбільш напружений час перед складанням проєкту, екзамену [13].

If an English phraseological unit does not have an equivalent or analogue in Ukrainian, and a literal translation could lead to a poorly understood literalism, the translator must refrain from conveying imagery and use a descriptive translation – explaining the meaning of phraseological units using a free combination of words.

Contextual replacements play an important role in the process of translating phraseological expressions. They involve the translator finding a Ukrainian phraseological unit that, while not corresponding in meaning to the English one, accurately conveys its meaning in a specific context [12].

The choice of translation techniques for phraseological units also depends on the presence or absence of national coloration. For an adequate translation of English phraseological units, it is necessary to consider the figurative, visual, emotional, stylistic, and ethnic components.

1.3 Specifics of translation in the field of biotechnology

During the past decade, English-language terminology has been extensively represented in Ukrainian linguistics across various fields of social activity: cybernetics, economics, medicine, linguistics, and so on. The diversity of linguistic aspects regarding individual lexical subsystems shows that the terminology of biotechnology is in the process of formation, being one of the new rapidly developing knowledge areas. The development of biotechnology in most countries around the world becomes possible through the collective interaction of many generations of representatives from various scientific fields – biologists, biochemists, geneticists, immunologists, microbiologists, pharmacologists, and other specialists. As a result, the terminology of biotechnology constantly expands due to the emergence of a large number of new terms [16].

Biotechnological terminology is in the formative stage, so studying the general trends in the development of terminology in English, Ukrainian languages, as well as its specific features, is interesting from both theoretical and practical perspectives, in our view. Studying the word-formation and syntactic types of biotechnology terms in terms of their productivity/non-productivity, researching the derivational potential of modern biotechnology terms, identifying syntagmatic and paradigmatic relations and connections between terms at different levels of hierarchy are relevant issues. The formation of the terminology system in biotechnology is closely related to the formation of biotechnology itself as a scientific field. Despite the fact that biotechnology emerged in the late 20th century, its terminology system is a formation associated with the entire development of genetic-biological issues since ancient times. The methodology of biotechnological research has contributed to the convergence of natural sciences and humanities, as well as fundamental and applied scientific activities. As a result, in the early 21st century, biotechnology transformed into a comprehensive integrative science that combines several dozen sections and directions. Biotechnological terminology contains a large number of terms borrowed from the terminologies of related disciplines such as biology, genetics, ecology, bioethics, philosophy, sociology, psychology, and jurisprudence. From a formal expression perspective, a significant number of biotechnological terms are

composed using terminological elements of Greco-Latin origin, which are borrowed from the terminologies of biology and genetics [17].

Research on biotechnology terms shows that structurally, biotechnological terms are divided into single-word lexemes and collocations. Depending on the number of components and the nature of the relationships between them, two-component and multi-component terms are distinguished. They are recognized as an optimal linguistic tool in the field of current nomination in modern science. Two-component collocations, that is, terms consisting of two full-fledged words, primarily belong to such structural types as: N + N (nucleotide sequence, pesticide resistance, resistance management, semantic codon, stem cell, radiation genetic, gene therapy); A + N (structural gene, asexual reproduction, bacteriostatic agent, biological resources, monoclonal antibody); N + Prep + N (culture of cells, hybridization of cells, labeling of foods); Past Participle + N (biobased products, linked genes/markers, relaxed plasmid, conserved sequence, applied research); Present Participle + N (flanking region, joining (J) segment, immortalizing oncogene, reading frame, transforming oncogene); N + Gerund (cell engineering, gene splicing, mutation breeding, molecular farming, chromosome walking, antigenic switching, alternative splicing) [18].

Among the three-part collocations, proper collocations and lexical units with a transitional status are encountered: gene expression profiling, genetically modified organism, plant-incorporated protectants, single nucleotide polymorphisms, herbicide-tolerant crop, polymerase chain reaction, recombinant DNA molecules, recombinant DNA technology, soil conservation practices, open reading frame, variable surface glycoprotein. A small number of prepositional constructions are among the three-part collocations: vertical transfer of genes. Among the four-word terms, proper collocations and lexical units with a transitional status are also encountered: restriction enzyme cutting site, utilization of farm animal genetic, restriction fragment length polymorphism. The division of biotechnology terms by lexical, word-forming, and graphic length indicates that optimization processes occur in this lexical sphere, just as in language in general.

Structurally simpler and shorter terms are convenient to use, but they may not provide enough combinations of two to three morphemes or five to six letters to name a vast number of specialized concepts. Shorter terms do not always satisfy the user in terms of accuracy either since it is quite difficult to express the content of a complex concept through two to three features, considering that at least one root or word-forming morpheme is needed to describe one feature. On the other hand, long terms, which provide more opportunities for adequate representation of a large number of complex specialized concepts, are "pushed back" by language according to the law of speech effort economy. Therefore, in the process of formation and development of terminology, consciously or unconsciously selected, especially due to competition between terms, preference is given to terms that are neither the shortest nor the longest but whose length is approximately 20-50% of the maximum. Terms of shorter length function in language to create the most important and frequently used terms (in line with speech effort economy), while longer terms are used to express particularly complex but less frequently used concepts (in line with accuracy requirements). As numerous studies show, three-, four-, five-, and six-component terms have become widespread in various terminologies due to the fact that, characterized by the property of nomination integrity, they fully cover the conceptual field of the investigated terminological system and, as features accumulate, can theoretically infinitely increase the number of their components [19].

Researchers note the steady growth and spread of multi-component terms in scientific language, driven by the need to reflect new discoveries and their innovative implementation in all spheres of societal life. Multi-component terms are characterized by their ability to identify various aspects of an object at the species/subspecies level of nomination without additional descriptive definitions: arbitrarily primed polymerase chain reaction, biosynthetic antibody binding sites, blunt-end cut, living organ donation, artificial antibody library, plant-incorporated protectants, gene therapy, gene mapping, genomic library. As the number of components in multi-component terms increases, the number of structural models also increases [20].

The increase in the number of components in multi-component terms itself leads to a reduction in their number in scientific texts. It is noted that the increase in the length of multi-component terms reflects a desire for precision in expressing concepts, as the increase in the number of components in a term reduces its ambiguity. The increase in the length of multi-component terms is associated with some difficulties in their use, sometimes leading to the formation of abbreviations in language. Their active role in the structure of sectoral scientific texts is due to their concise, encoded form of expressing relevant concepts, significantly reducing the length of terminological phrases.

CHAPTER 2

STYLISTIC PROBLEMS IN THE TRANSLATION OF SCIENTIFIC AND TECHNICAL TEXTS

2.1 Analysis of lexical transformations in the translation of scientific texts (Based on Texts in the Field of Biotechnology)

Accurate and efficient translation of scientific texts is of paramount importance for the global exchange of knowledge and the development of scientific research. Biotechnology, as a rapidly developing field, poses unique challenges for translators due to its specialised terminology, complex concepts and the need to accurately convey experimental procedures and results. Lexical transformations, which are defined as changes made to lexical units (words or phrases) in the translation process, play a key role in achieving accurate and meaningful translation of scientific texts.

When translating scientific texts, a wide range of lexical transformations is used, each of which has a specific purpose - to overcome semantic and stylistic differences between the source and target languages. The most common types of lexical transformations include

1. Substitution.

Replacing a lexical unit in the source language with a corresponding unit in the target language that conveys the same or close meaning. For example, translating «gene» from English into Ukrainian as «ГЕН».

2. Generalisation.

Replacing a specific term with a more general term in the target language to broaden the scope of the meaning. For example, translating «Escherichia coli» into Ukrainian as «E. coli», which covers all strains of the bacterium rather than a specific one.

Example:

Source: «The study examined the effect of the drug on the Escherichia coli bacteria»

Target: «Дослідження вивчало вплив препарату на бактерії кишкової палички»

3. Concretization.

Replacing a general term with a more specific term in the target language to narrow the scope of meaning and provide greater precision. For instance, translating «protein» to Ukrainian as «білок», specifying the type of macromolecule rather than using a broader term like "молекула".

Example:

Source: «The drug targets a specific protein involved in cell signaling»

Target: «Препарат впливає на білок, задіяний у сигналізації клітин»

4. Explication.

Expanding on a concept or term in the source language with a more detailed explanation or phrase in the target language for greater clarity. For example, translating «transcription» into Ukrainian as «процес синтезу РНК на основі ДНК», providing a concise definition of the biological process.

Example:

Source: «Transcription is the process by which DNA is used to produce RNA»

Target: «Транскрипція – це процес, за допомогою якого ДНК використовується для синтезу РНК»

5. Compensation.

Introducing additional information in the target language that is not present in the original to preserve the overall meaning and context of the text. For example, translating ‘This study was aimed to investigate the effects of the drug on gene expression’ into Ukrainian as «У цьому дослідженні вивчали вплив препарату на експресію генів», adding the subject «дослідженні» to maintain the grammatical structure of the sentence.

Example:

Source: "The researchers found that the drug downregulated the expression of several genes."

Target: "Дослідники виявили, що препарат пригнічує експресію декількох генів."

The application of lexical transformations in the translation of biotechnology texts is particularly crucial in the following areas:

1. Terminology.

Accurate translation of specialised terms and concepts is essential to ensure the scientific accuracy and credibility of the translated text. Translators need to have in-depth knowledge of both the source and target languages, as well as the specific field of biotechnology, to identify and select the most appropriate equivalents.

Example:

Source: «The researchers used CRISPR-Cas9 gene editing technology to modify the cells»

Target: «Дослідники використовували технологію редагування генів CRISPR-Cas9 для модифікації клітин»

2. Experimental Procedures.

Clearly and accurately conveying the details of experimental procedures requires careful attention to lexical choices. Translators must ensure that the terminology used in the target language aligns with the standard practices and protocols of the scientific community.

Example:

Source: "The cells were cultured in a medium containing the drug for 24 hours."

Target: "Клітини культивували в середовищі, що містило препарат, протягом 24 годин."

3. False Friends:

While substitutions may seem simple, having ‘fake friends’ can create significant problems. These are words in different languages that have similar spellings or origins but different meanings. For example, «culture» in English refers to the growth of microorganisms, while «культура» in Ukrainian translates to the broader concept of culture in general. Careful analysis of the context and knowledge of the specific industry is crucial to avoid translation errors.

Example:**Source:** «The researchers cultured the bacteria in a specific medium»**Target:** NOT «Дослідники культивували бактерії у специфічній культурі»
(incorrect)**Target:** «Дослідники вирощували бактерії у спеціальному середовищі»
(correct)

4. Neologisms:

The rapid pace of discovery in biotechnology necessitates the creation of new terms or neologisms. To ensure accurate translation, translators need to be up-to-date with the latest terminology in both the source and target languages. In such cases, it is useful to consult specialised glossaries and databases.

Example:**Source:** «The study employed a novel gene editing technique called base editing»**Target:** «Дослідження використовувало нову технологію редагування генів під назвою редагування основ» (assuming "base editing" is a neologism in Ukrainian)

Lexical transformations are the cornerstone of achieving accurate and meaningful translation of scientific texts, especially in the ever-evolving field of biotechnology. By applying various transformation techniques and taking into account the specifics of this field, translators can effectively overcome the language barrier and contribute to the global dissemination of scientific knowledge.

2.2 Grammatical transformations in the translation of scientific and technical texts from English to Ukrainian (Based on Texts in the Field of Biotechnology)

Accurately conveying a scientific message requires not only accurate vocabulary, but also skilful manipulation of grammatical structures during translation. This section discusses the various grammatical transformations used in the translation of scientific and technical texts, in particular in the field of biotechnology, from English into Ukrainian.

1. Permutation (Word Order Change).

The order of words and phrases can differ significantly between English and Ukrainian. Translators often need to rearrange the sentence structure to ensure grammatical correctness and natural flow in the target language.

- **English.** «The researchers cultured the bacteria in a specific medium for 24 hours»
- **Ukrainian (Incorrect).** «Дослідники культивували бактерії в спеціальному середовищі 24 години» (Direct word order transfer, grammatically incorrect)
- **Ukrainian (Correct).** «Дослідники вирощували бактерії у спеціальному середовищі протягом 24 годин» (Rearranged for Ukrainian sentence structure and added preposition "протягом" for duration)

2. Substitution (Grammatical Category Change).

Grammatical categories like tense, voice, and number may not have direct equivalents between languages. Translators must identify suitable replacements that preserve the intended meaning.

- **English.** «The study investigated the effects of the drug on gene expression» (Past Simple Tense, Active Voice)
- **Ukrainian.** «Дослідження вивчало вплив препарату на експресію генів» (Past Tense, Passive Voice)
- **Explanation.** Ukrainian often utilizes the Passive Voice for scientific writing, and the past tense accurately reflects the completed study.

3. Addition (Introducing Information).

Ukrainian grammar sometimes requires additional elements for clarity compared to English. Translators may introduce articles, prepositions, or auxiliary verbs to enhance readability.

- **English.** «These results suggest a potential new treatment for the disease.» (Demonstrative pronoun "These" is implied)

- **Ukrainian.** «Отримані результати вказують на потенційно новий метод лікування хвороби» (Added article "Отримані" and auxiliary verb "вказують" for grammatical completeness)

4. Omission (Removing Unnecessary Information).

Certain grammatical structures present in English might be redundant when translated to Ukrainian. Translators can omit unnecessary articles, pronouns, or helping verbs to achieve a concise and natural-sounding target text.

- **English:** «The drug was found to be effective in treating cancer cells» (Redundant "to be")
- **Ukrainian:** «Препарат виявився ефективним у лікуванні ракових клітин» (Omitted helping verb "to be" for conciseness)

5. Subject-Verb Agreement.

Ukrainian requires subject-verb agreement in number and person. Translators must pay close attention to collective nouns (e.g., "data") or singular nouns with plural meanings (e.g., "equipment") in English to ensure proper verb conjugation in Ukrainian.

- **English.** «The data from the experiment were analyzed using statistical software» (Plural data)
- **Ukrainian (Incorrect).** «Дані з експерименту було проаналізовано за допомогою статистичного програмного забезпечення» (Singular verb form)
- **Ukrainian (Correct).** «Дані з експерименту були проаналізовані за допомогою статистичного програмного забезпечення» (Plural verb form agrees with plural data)

Mastery of grammatical transformations is crucial for effective translation of scientific and technical texts. By understanding the differences between the grammatical structures of English and Ukrainian and applying these transformations wisely, a translator can ensure that scientific concepts are conveyed accurately and clearly in the target language.

2.3 Lexical and grammatical transformations in the translation of scientific and technical texts

The previous sections have presented the theoretical basis of lexical and grammatical transformations in the translation of scientific texts. The next step is to analyse these transformations in detail using specific examples from the field of biotechnology.

In the realm of biotechnology, translating scientific and technical texts from English to Ukrainian involves numerous lexical and grammatical transformations. These transformations are crucial for ensuring accurate and meaningful communication across languages, especially in a field as complex and specialized as biotechnology. The translation of scientific and technical texts, particularly in a specialized field like biotechnology, requires a nuanced approach. Both lexical (word-related) and grammatical transformations are often necessary to achieve an accurate, clear, and natural-sounding Ukrainian text. Here's an analysis of these transformations:

1. Translation of Scientific Terminology.

English: «Gene editing using CRISPR-Cas9 technology»

Ukrainian: «Редагування генів за допомогою технології CRISPR-Cas9»

2. Acronym Expansion.

English: «DNA sequencing techniques (e.g., PCR, NGS)»

Ukrainian: «Техніки послідовного аналізу ДНК (наприклад, ПЛР, нове покоління послідовного аналізу)»

3. Technical Term Clarification.

English: «Bioreactor fermentation process»

Ukrainian: «Процес ферментації у біореакторі»

4. Grammatical Transformations.

Verb Form and Tense Changes:

English: «The experiment will be conducted next month»

Ukrainian: «Експеримент буде проведено в наступному місяці»

Subject-Verb Agreement:

English: «The cells grow rapidly»

Ukrainian: «Клітини швидко зростають»

Sentence Structure Adjustments:

English: «This protein is crucial for cellular function»

Ukrainian: «Цей білок є важливим для клітинної функції»

5. Ambiguity Resolution:

English: «The enzyme activity was measured»

Ukrainian: «Була виміряна активність ферменту»

Cultural and Contextual Adaptation:

English: «Ethical considerations in gene editing»

Ukrainian: «Етичні аспекти редагування генів»

Lexical Transformations:

— Direct Equivalents:

- Ideally, some scientific terms have direct equivalents in Ukrainian. These can be readily adopted for translation, ensuring accuracy and maintaining the technical register.

➤ Example: "DNA" translates directly to "ДНК" (DNK).

- Partial Equivalents:

— Sometimes, a Ukrainian term might share the core meaning of the English term but have slight variations. Careful selection is necessary to ensure the translated term conveys the precise scientific nuance.

➤ Example: "Cell culture" might translate to "культивація клітин" (kultyvatsiia klitin) which emphasizes the cultivation aspect.

- Descriptive Equivalents:
 - When a direct or partial equivalent isn't available, a descriptive phrase in Ukrainian can explain the concept. This is particularly relevant for newly emerging technologies or concepts.
 - Example: "CRISPR gene editing" might translate to "редагування генів за допомогою CRISPR" (redahuvannia heniv za dopomohoyu CRISPR), explaining the editing process.
- Cultural Equivalents:
 - Scientific terms can be culturally specific. In such cases, a Ukrainian term with a similar cultural connotation might be used.
 - Example: "Cutting-edge research" might translate to "передові дослідження" (peredovi doslidzhennia) which captures the idea of being at the forefront.
- Neologisms:
 - For entirely new scientific concepts, Ukrainian scientific terminology might not have established equivalents. Here, translators might create new Ukrainian terms based on existing terminology.
 - Example: "Bioprinting" could translate to "біодрук" (biodruk), a new term based on the concept of printing.

Grammatical Transformations:

1. Verb Tense:

— As seen earlier, scientific English often uses the present simple tense for general truths or ongoing processes. Ukrainian typically uses the present tense for the same purpose. However, the present perfect continuous in English might require the simple past or present perfect in Ukrainian depending on the context.

2. Voice:

— Scientific English often uses the passive voice for a neutral tone. Ukrainian might prefer the active voice for clarity and conciseness, especially in biotechnology where specific actions are often highlighted.

3. Articles:

— English uses definite (the) and indefinite (a/an) articles more frequently than Ukrainian. Ukrainian often omits articles when referring to general concepts or previously mentioned entities.

4. Negation:

— Double negatives are avoided in Ukrainian. A single negative word ("не" - ne) or a negative phrase is used.

5. Prepositional Phrases:

— The order of prepositions and nouns in prepositional phrases can differ. In some cases, the entire structure might need rearrangement for clarity.

6. Sentence Structure:

- While basic sentence structure is similar, Ukrainian allows for more complex sentence structures. However, overly complex sentences should be avoided for clarity.
- Word Order: Ukrainian allows for more flexibility in word order for emphasis or stylistic purposes.

Effective translation of scientific and technical texts requires a combination of lexical and grammatical transformations. Translators must consider both the accuracy of scientific meaning and the natural flow of the target language (Ukrainian) to ensure the translated text is clear, concise, and maintains the scientific rigor of the original English text.

Translating scientific and technical texts in biotechnology requires a deep understanding of both languages, along with expertise in the subject matter. Lexical and grammatical transformations play a crucial role in ensuring accurate and contextually relevant translations. By navigating these transformations effectively, translators bridge the linguistic and scientific gaps, facilitating global collaboration and knowledge dissemination in the field of biotechnology.

CONCLUSIONS

The study delved into the intricate challenges faced in translating scientific and technical texts from English to Ukrainian, particularly focusing on texts in the field of biotechnology. The research aimed to analyze and address the lexicosemantic and stylistic hurdles encountered during the translation process.

In Chapter 1, the lexico-semantic features of scientific and technical texts were examined. This included an exploration of specialized terminology, phraseological units, and expressions unique to the field of biotechnology. The theoretical aspects of translating these linguistic elements were also discussed, emphasizing the importance of maintaining accuracy and clarity while conveying scientific concepts.

Furthermore, Chapter 2 delved into the stylistic challenges encountered in translating scientific and technical texts. An analysis of lexical and grammatical transformations was conducted, highlighting the complexities involved in preserving the intended meaning and style of the original text while adapting it to the target language and cultural context.

Throughout the research, it became evident that translating scientific and technical texts requires a deep understanding of both languages, as well as expertise in the subject matter. Lexical and grammatical transformations play a crucial role in ensuring accurate and contextually relevant translations. The specific challenges faced in the field of biotechnology underscored the need for meticulous attention to detail and a nuanced approach to translation.

In conclusion, the study contributes to the broader discourse on translation studies by shedding light on the intricacies of translating scientific and technical texts. It underscores the importance of employing effective strategies and techniques to overcome lexico-semantic and stylistic challenges, ultimately facilitating clearer communication and knowledge dissemination in the field of biotechnology.

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РЕЗЮМЕ

Дослідження присвячене аналізу лексико-семантичних та стилістичних особливостей перекладу науково-технічних текстів з англійської на українську мову. В якості матеріалу дослідження виступають тексти з галузі біотехнології.

Аналіз трансформацій на рівні лексики, що виникають під час перекладу науково-технічних термінів та фразеологічних одиниць. Розглядаються різноманітні типи лексичних трансформацій, включаючи прямі відповідники, часткові відповідники, описові відповідники, культурні еквіваленти та неологізми. Досліджується вплив факторів, таких як точність, зрозумілість та реєстр, на вибір лексичних трансформацій. Досліджуються перетворення часів дієслів, заставних форм, артиклів, заперечень та прийменникових конструкцій під час перекладу з англійської на українську мову.

Дослідження виявляє необхідність застосування різноманітних лексичних та граматичних трансформацій для забезпечення точного та природного звучання перекладеного українського тексту. Наголошується на важливості збереження наукової строгості та змістовного значення оригіналу при перекладі.

Висновки, отримані у ході дослідження, підкреслюють складну природу перекладу наукових та технічних текстів, особливо в контексті біотехнології. Дослідження підкреслює важливість точного відтворення специфічної термінології, ідіоматичних висловів та технічних деталей, зберігаючи відповідний стиль та семантичну цілісність у цільовій мові. Крім того, дослідження може надати уявлення про потенційні стратегії або рекомендації щодо ефективного вирішення цих викликів у сфері перекладу в біотехнології.

Додаток Е

**РЕЦЕНЗІЯ НА КУРСОВУ РОБОТУ
З ПЕРЕКЛАДУ З АНГЛІЙСЬКОЇ МОВИ**

студента(ки) 4 курсу групи ПА 17-20 факультету германської філології і перекладу КНЛУ спеціальності 035 Філологія, спеціалізації 035.041 Германські мови та літератури (переклад включно), перша – англійська, освітня програма Англійська мова і друга іноземна мова: усний і письмовий переклад у бізнес-комунікації Сороки Аліни Сергіївни

за темою Lexico-Semantic and Stylistic Challenges in Translating Scientific and Technical Texts from English to Ukrainian (Based on Texts in the Field of Biotechnology)

	Критерії	Оцінка в балах
1.	Наявність основних компонентів структури роботи — <i>загалом 5 балів</i> (усі компоненти присутні – 5 , один або декілька компонентів відсутні – 0)	
2.	Відповідність оформлення роботи, посилань і списку використаних джерел нормативним вимогам до курсової роботи — <i>загалом 10 балів</i> (повна відповідність – 10 , незначні помилки в оформленні – 8 , значні помилки в оформленні – 4 , оформлення переважно невірне – 0)	
3.	Відповідність побудови вступу нормативним вимогам — <i>загалом 10 балів</i> (повна відповідність – 10 , відповідність неповна – 8 , відповідність часткова – 4 , не відповідає вимогам – 0)	
4.	Відповідність огляду наукової літератури нормативним вимогам — <i>загалом 15 балів</i> (повна відповідність – 15 , відповідність неповна – 10 , відповідність часткова – 5 , не відповідає вимогам – 0)	
5.	Відповідність практичної частини дослідження нормативним вимогам — <i>загалом 20 балів</i> (повна відповідність – 20 , відповідність неповна – 15 , відповідність часткова – 10 , не відповідає вимогам – 0)	
6.	Відповідність висновків результатам теоретичної та практичної складових дослідження — <i>загалом 10 балів</i> (повна відповідність – 10 , відповідність неповна – 8 , відповідність часткова – 4 , не відповідає вимогам – 0)	

Усього набрано балів: _

Оцінка:

«До захисту» _____

(42-70 балів)

_____ (підпис керівника)

«На доопрацювання» _____

(0-41 балів)

_____ (підпис керівника)

