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Foreign Language Borrowings of Biotechnological Terminology in the English Language

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Abstract. The article deals with the problem of linguistic borrowings in the English terminology of biotechnology. The purpose of the research is the analysis of borrowings in the biotechnological terminology of the English language and the identification of their main sources, determined by both historical and scientific events in the development of society. The material of the study was a sample consisting of terminological units of the modern English language related to the field of biotechnology, selected from specialized dictionaries, scientific works on the problems of biotechnology, Internet sites dedicated to the creation and production of new modified organisms and products. The article is aimed at researching the etymological and linguistic aspects of borrowed terms, analyzing their origin and adaptation in the field of biotechnology. The etymological analysis highlights those sources that participated in both the formation and development of the modern biotechnological vocabulary of the English language. The study determined that the borrowed terminological units of the English terminology of the field of biotechnology consist of the Greek-Latin, French and German borrowings. The article examines the influence of classical languages, in particular Latin and Greek, on the formation of biotechnological terminology. It is noted that the Greek and Latin languages are considered the main sources of enrichment of the biotechnological terminology. The analysis focuses on the origin, evolution and assimilation of biotechnological terms into the English language. In addition, the paper examines the impact of these borrowings on the relationship between scientific innovation and language evolution. The results of this study expand our understanding of the evolution of biotechnological terminology and the processes of linguistic adaptation and interaction between linguistic and scientific environments in modern biotechnological research.

Key words: borrowing, biotechnological terminology, terminological element, classical languages, language sources.

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Introduction. Modern terminology in the field of biotechnology in English is one of the most extensive and complex systems, correlated with a certain professional field of human activity aimed at the creation and use of genetically transformed biological objects (for example, transgenic plants, somatic hybrids, etc.).

Although biotechnology emerged at the end of the 20th century, its terminological system is a formation associated with the development of biological and genetic problems, starting from antiquity. Biotechnological research methodology contributed to the integration of humanitarian and natural sciences, as well as applied and fundamental activities. As a result, at the beginning of the XXI century. the transformation of biotechnology into a complex integrative science, which unites dozens of directions and sections, took place. Most of the biotechnological terminology is borrowed from related disciplines - genetics, biology, microbiology, bioethics, philosophy, sociology, ecology.

Linguists have carried out a number of studies of biotechnological terminology, defining its main characteristics. A number of articles related to biotechnological terminology were written by O. Myshak: “The main means of formation of biotechnological terms” (Myshak, 2017), “Morphological peculiarities of English one component terms of biotechnologies” (Myshak, 2017), “Formation of English biotechnological terms on the basis of Greek and Latin prefixes" (Myshak, 2018), "Abbreviation as a method of terminology formation used in biotechnology" (Myshak, 2017). The scientific studies of O. Syrotin "Multi-component English terms of Biotechnology sphere" and "Peculiarities of the structure and translation of biotechnological terms" are devoted to the study of multi-component biotechnological terms and their translation (Syrotin, 2012, 2017). L. Rogach focuses his attention mainly

on the semantic phenomena characterizing the English biotechnological terminology (Rogach, 2019). Over the past few years, O. Syrotina has published several articles, devoted to conceptual dominants and cognitive categories of English-language biotechnological terminology (Syrotina, 2021, 2022).

Despite the large number of works devoted to biotechnological terminology in the scientific literature, the problem of language borrowing requires more detailed research in connection with the actualization of various aspects of language interaction.

Literature Review. In recent decades, due to the active development of various aspects of interlingual interaction the issue of borrowings is devoted to many works by such linguists as E. Raist, E. Haugen, L. Bloomfield, L. Bulakhovsky, V. Danilenko, V. Kostomarov, and others.

In this regard, against the background of a growing number of studies, a contradiction has emerged between traditional schemes for explaining borrowing, mainly and new ideas about linguistic processes and the structure of language, which spread in the second half of the 20th century. This has led to the fact that the study of the processes and results of lexical borrowing has recently been carried out in two directions. Within the first direction, linguists N. Amosova, L. Bloomfield, A. Mayorov focused on the intrasystem aspect of the entry of foreign language elements into the borrowing language. Within the framework of the second approach, researchers, U. Weinreich, E. Haugen concentrate on considering borrowing in the context of bilingualism, interlingual contact and intersystem interaction of languages.

The aim of the paper is to reveal the main sources of borrowings of some English biotechnological terms caused by both historic and cultural events of society development. Etymological analysis is sure to highlight those sources that took part in both formation and development of contemporary biotechnological English vocabulary.

Materials and methods of research. The research material was a sample consisting of more than 800 terminological units of modern English related to the field of biotechnology, selected from specialized dictionaries (Glossary of Biotechnology and Genetic Engineering, FAO Glossary of Biotechnology for Food and Agriculture, Glossary of Biotechnology Terms) scientific works on biotechnology issues, Internet sites dedicated to the creation and production of new modified organisms and products, etc. The study was based on a sample of lexicographic data recorded in English explanatory dictionaries: Cambridge Dictionaries Online, Collins English Dictionary Online, Marriam Webster Dictionary Online, Macmillan Dictionary Online, Longman Dictionary of Contemporary English.

The main method used in our study is the etymological analysis of the contemporary biotechnological English vocabulary.

Results. The phenomenon of lexical borrowings is a common issue for numerous languages. Some findings shaded light on language alteration and came up with important ideas about the origination of borrowing. Such studies started some centuries ago when linguists wanted to know the relation between languages and how they impacted each-other. Because language change includes mostly includes vocabulary, conclusions drawn from different studies made it possible to present the features of borrowings and the process they undergo before they enter a language, the motivation for borrowing words, as well as the first evidences of borrowings in English (Bujupaj, 2021).

When studying the process of replenishing the vocabulary of a language, it is important to decide what should be understood by borrowing and which terms can be considered borrowed. According to the generally accepted definition, borrowing is the process of moving elements of different types from one language to other languages. In particular, J. Felizon gives the following interpretation: "Borrowing is a process during which a language acquires linguistic units from another language" (Phelizon,1976:125).

H. Bagrii characterizes borrowing as a universal linguistic phenomenon, which consists in the adoption by one language of linguistic material from another language through interlanguage contacts, which may differ in level and forms. It is worth emphasizing that the study of this process as a result of contacts between peoples and their languages is important for solving numerous linguistic problems and issues

related to history, archeology, psychology and other sciences (Bagrii, 2014)].

Foreign borrowings are entirely penetrated into the English language. At the beginning of XX century Otto Harry Jespersen underlined the following idea in his book "Language: Its Nature, Development and Origin": "English is the chain of borrowing words" (Jespersen, 1922: 15). English language vocabulary has been constantly changed throughout the English history by means of various invasions and conquests, trade policies and culture influences of neighbouring countries.

Linguistic scientists give different terms in their scientific works such as: "loanword", "borrowed word". The analysis of their definitions allows us to make a conclusion that these terms can be regarded as synonyms having the same meaning. In the Free Dictionary by Farlex a "loanword" is a word adopted from another language and completely or partially naturalized (Farlex, 1987). S. Kemmer gives a similar definition to this term: "It is a word adopted by the speakers of one language from a different language... while the abstract noun 'borrowing' refers to the process of speakers adopting words from a source language into their native language" (Kemmer, 2016). B. Hoffer, a professor of English at Trinity University and one of the founders of the International Association for Cross-cultural communication, interprets "borrowing" as the process of importing linguistic items from one linguistic system into another, a process that occurs any time two cultures are in contact over a period of time (Hoffer, 2002).

It should be noted that borrowings are not limited only to the sphere of vocabulary. Under certain conditions, any linguistic material can be borrowed. This is possible in the conditions of language contact, which is characterized by a certain level of bilingualism, the quantitative ratio of the interacting peoples, the duration and intensity of contacts, the level of language proficiency, the functional role of languages in the life of a bilingual society, the status and prestige of the languages of the interacting peoples and the cultures they represent, relations and attitude to bi- or multilingualism, as well as to the interference that accompanies this phenomenon.

A large number of terminological borrowings is a characteristic feature of the biotechnological field, which we consider as a branch of science that studies the possibilities of using living organisms, their systems or the products of their vital activities to solve technological problems, as well as the possibility of creating living organisms with the necessary properties by the method of genetic engineering. The word, entering into use in the biotechnological sphere, becomes an element of the terminology system that serves the field of biotechnology and forms a complex of terminological systems depending on the direction of biotechnological activity, which are combined into a single terminology system, which O. Myshak calls the biotechnology terminology system or the terminology system of the subtext "biotechnology" (Myshak, 2017). As a term functions as a naming unit within a scientific discipline, we define the biotechnological terminology system as a collection of lexical units that align with the concept of "biotechnology" and articulate its conceptual meaning, while also revealing evaluative or pragmatic meaning (Myshak, 2016:13).

A biotechnological term is a constituent of the biotechnological terminology system. It is characterized as a word or lexical unit that articulates knowledge about the utilization of living organisms and biological processes in production, serving the field of biotechnology – a scientific discipline that amalgamates aspects of both biology and technology (Myshak, 2017: 20).

In terms of formal expression, a considerable proportion of biotechnological terms is derived from elements of Greek-Latin origin, borrowed from the terminology of biology and genetics. Given the broad and extensive semantic connections that biotechnological terms share with related terminologies, distinguishing them clearly becomes challenging. Below, examples of such terms borrowed from related disciplines are provided:

1) medical: to affect (about a disease), allergy – increased sensitivity of the body to substances that cause various disorders; carcinoma – one of the names of a malignant cancerous tumor; diagnosis – recognition of the disease, its name; infection – infection; metabolic disease – metabolic disorder; outbreak – signifies the sudden and unexpected spread of a disease with an

elevated level of cases within a defined geographic area; vaccine – a preparation of dead or attenuated (weakened) pathogens, or of derived antigenic determinants, that can induce the formation of antibodies in a host, and thereby produce host immunity against the pathogenvaccine; vector – carrier of infection; viruse – a noncellular biological entity that can reproduce only within a host cell. Viruses consist of nucleic acid covered by protein; some animal viruses are also surrounded by a membrane; viral disease – an illness caused by a virus, which is a small infectious agent that replicates only inside the living cells of other organisms.

2) biological, which also includes botanical and zoological terms: adaptation – adaptation of the organism to new conditions of existence in the external environment, which arose in the process of evolution; antibiosis – a state of the body consisting in an almost complete but reversible cessation of vital functions; asexual – a way of reproduction that is carried out without meiosis or fusion of gametes; cell – the lowest denomination of life thought to be possible, chromosome – in eukaryotic cells, chromosomes are the nuclear bodies containing most of the genes largely responsible for the differentiation and activity of the cell, gamete – a reproductive cell of multicellular organisms, which ensures the transfer of hereditary information; germ – 1) the botanical term for a plant embryo, 2) a disease-causing microorganism; nutrition – nourishment; selection – the process of selection under artificial and natural conditions; unicellular – one-celled, tissues, organs or organisms consisting of one cell (FAO Glossary of Biotechnology for Food and Agriculture).

3) terms of genetics: allele – allele, one of the forms of a gene; autosome – an autosome, any of the chromosomes of a set, except sex chromosomes; anticodon – anticodon, triplet of nucleotides (often modified), which is part of the anticodon loop of transport RNA (tRNA); sistron – DNA sequence coded for a certain polypeptide; gene; epistasis – the interaction of genes located in different loci, in which one gene suppresses the action of another; exon – a section of a eukaryotic gene, which is transcribed as part of the primary transcript, and after processing is part of a functional RNA molecule; to express – to transcribe and translate a gene; gene – gene, the basic physical and functional unit of heredity; recombination – the process of offspring obtaining a combination of genes different from the combination of genes of one of its parents (FAO Glossary of Biotechnology for Food and Agriculture).

4) chemical: alkaloids – a group of nitrogen-containing organic substances, usually of plant origin; antibiotic – a chemical substance – the result of the synthesis of fungi and bacteria, which kills other organisms or delays their growth; antioxidant – a compound that slows down the rate of oxidative reactions; bacteriocide – a chemical reagent or a drug that kills bacterial cells; catalyst is a substance that accelerates a chemical reaction; contaminant – an undesirable chemical component present in a compound or a mixture of compounds; purine – a nitrogenous base that has two rings and is part of nucleic acids (Glossary of biotechnology and genetic engineering,1999).

5) environmental: abiotic factor – a component of inanimate, inorganic nature; biodiversity – the variability among living organisms from all sources, including, *inter alia*, terrestrial, marine and other ecosystems and the ecological complexes; biome – a large regional or subcontinental subdivision of the biosphere; bioremediation – biological cleaning, use of microorganisms to solve environmental problems; habitat of life – a way of life (FAO Glossary of Biotechnology for Food and Agriculture).

There is a considerable amount of borrowed foreign words and phrases in biotechnological English, which are mainly of Latin and Greek origin. They are the following. Callus (pl.: calli) – a protective tissue, consisting of parenchyma cells, that develops over a cut or damaged plant surface (Glossary of biotechnology and genetic engineering,1999). Chimera (or chimaera) – an organism whose cells are not all genotypically identical. This can occur as a result of: somatic mutation; grafting or because the individual is derived from two or more embryos or zygotes (Glossary of biotechnology and genetic engineering,1999). Cilium (pl.: cilia**)** – hairlike locomotor structure on certain cells; a locomotor structure on a ciliate protozoan (Glossary of biotechnology and genetic engineering,1999). Genera –

plural form of genus (pl.: genera) – a group of closely related species, whose perceived relationship is typically based on physical resemblance, now often supplemented with DNA sequence data (Glossary of biotechnology and genetic engineering,1999). Granum (pl.: grana) – structure within the chloroplasts, appear as green granules with the light microscope and as a series of parallel lamellae with the electron microscope. They contain the chlorophyll and carotenoid pigments directly involved in photosynthesis (Glossary of biotechnology and genetic engineering,1999). Cambium (pl.: cambia) – a one or two cells thick layer of plant meristematic tissue, between the xylem and phloem tissues, which gives rise to secondary tissues, thus resulting in an increase in the diameter of the stem or root. The two most important cambia are the vascular (fascicular) cambium and the cork cambium (Glossary of biotechnology and genetic engineering,1999).

Latin borrowed terms serve to nominate the place where biotechnological processes are carried out, for instance: ***in vitro*** (lat.) – growing plant objects "in glass" (test tube, flask, bioreactor) on artificial nutrient media under aseptic conditions (Glossary of biotechnology and genetic engineering,1999), ***in vivo*** (lat.) – cultivation of living material in natural conditions (Glossary of biotechnology and genetic engineering,1999*),* ***in silico*** – in a computer file, a term denoting computer modeling (simulation) of an experiment, predominantly a biological one. The phrase was created by analogy with the phrases ***in vivo*** (in a living organism) and in vitro (in a test tube), which is often used in biology, and is not itself Latin (Glossary of biotechnology and genetic engineering,1999); ***in situ*** (lat.) – in the natural environment or in the original place (Glossary of biotechnology and genetic engineering,1999).

Greek and Latin terminological elements constitute a distinct neutral terminological foundation. Indeed, they no longer belong to any living language; thus, they equally belong to all (at least, to all languages within the European linguistic and cultural area). The use of a large number of Greek and Latin elements is associated with the trend of internationalizing knowledge, characteristic of the contemporary development of science and technology in the conditions of an information society. The most natural, historically proven path to the internationalization of terminology lies in the use of Greek and Latin elements as the most neutral and universal material for term creation.

A large number of biotechnological terms are formed using Latin and Greek word-forming formants. They can be divided into several unequal groups: a) derivative forms of Greek origin (a-/an, ana-, apo-, anti-, amphi-, aro-, andro- , auto-/auto, alo-, allo- , bio-, gene/geno-, - genesis, mono-, poly-, plo, pleio-, pseudo-, pan-, palin-, spore/a/, phen/pheno-, oligo-, soma-, hamo -/gamy, angium, gameto-, acro-, morpho-, mix-, koino-/cenosis, eu-/ev-, id-/aids-, troph-, hyper-, hypo-, phase/a/, iso - , macro-, micro-, cycl- , type/typist, techno-, nomo-, son-, ortho-, onto-); b) words of Latin origin (aberration, abbreviation, additivity, attenuation, vitalism, hybridization, degeneration, determination, inversion, dominance, inhibitors, interkinesis, collinearity (genes), complementarity, conjugation, convergence, locus, penetration, perforatorium, preformism, reduction, recombination, repair, replication, recessivity, transition, transversion, transduction, transcription, translocation, translation).

In the process of English terminology formation (in this case, considering terms related to biotechnology), Latin (re-, de-, in-, pre-, ad-) and Greek (anti-, auto-, chemo-, bio-) prefixes play a significant role due to their high frequency of use. Among the most productive prefixes used to form monocomponent biotechnological terms (nouns) are the following Latin prefixes: de- (decomposition), di- (dialysis, diffusion), im-, in- (inbreeding, inhibitor, intragenic, inorganic, immunity, imunosensor), inter- (interference, intermolecular, interaction), co- (co-factor, co-transfection, co-enzyme, co-linearity), re- (recombination, regeneration, remark (replica), recombinant), sub- (sub-clone, subspecies, sub-strain, substrate), super- (supergene, supercoil, superbug, supernatant, superstructure), trans- (transgenic, transposase, transposon, transcription, transformation, translation), ultra-(ultrasonication), ex- (excinuclease, excision, explantation, explant, express).

Greek prefixes are represented by the following elements: anti-(antibody, antibiotic, anticodon, antigen, antisense RNA, anti-oncogene), a-(abiotic, acellular), hyper-(hyperploid, hypertonic, hyperthermia), dia-(dialysis, diakinesis, diazotroph), epi-(episome, epistasis, epitope, epicotyl, epigenesist), hypo-(hypomorph, hypoploid, hypotonic, hypocotyl), para- (parahormone, paralogous, paratope, parasite), poly-(polymerase, polygene, polycistronic, polyadenylation, polymorphism, polypeptide), endo- (endocytosis, endoderm, endodermis, endomitosis, endonuclease, endopolyploidy).

Biotechnological terminology frequently incorporates Latin and Greek roots, showcasing the enduring influence of classical languages on scientific nomenclature. The utilization of Latin and Greek roots remains pervasive in the construction of biotechnological terms, aligning with a longstanding tradition in scientific naming. For instance, the term "biogenesis," originating from the Greek roots "bios" (life) and "genesis" (origin), is employed to describe the process of life formation. Another example is "genomics," derived from the Greek word "genoma" (meaning "that which is born"), widely used in the field to signify the comprehensive study of an organism's complete set of genes.

Genus (genos, Greek): a taxonomic rank employed in the biological classification of living organisms, indicating a group of species that share common characteristics. Biosensor (bio, Greek + sensor, Latin): a device utilizing biological components to detect and measure specific substances, such as glucose or antibodies. Antisense (anti, Latin + sense, Latin): a molecule complementary to a specific DNA or RNA sequence, often employed in gene regulation. Polymerase (poly, Greek + mer, Greek): an enzyme responsible for synthesizing long chains of nucleic acids by catalyzing the addition of nucleotide units (FAO Glossary of Biotechnology for Food and Agriculture).

German has significantly influenced biotechnological terminology, especially in the fields of biochemistry and molecular biology. Examples of terms borrowed from the German language are the followings: overexpression (überexpression, German), signifying the overexpression of a gene or protein in biotechnological contexts; proteinase K (Proteinase K, German) is an enzyme that digests proteins and is commonly used in molecular biology to remove proteins from nucleic acid preparations; ubiquitin (Ubiquität, German) is a small regulatory protein that plays a key role in the degradation of damaged or unneeded proteins within cells; polymerase chain reaction (Polymerase-Kettenreaktion, German) is a molecular biology technique used to amplify DNA exponentially, creating millions of copies of a specific DNA sequence; ligase (ligatur, German) is an enzyme that catalyzes the joining of two molecules, especially in the formation of a covalent bond between the ends of DNA strands during DNA replication and repair; Krebs Cycle (Kreislauf, German) is also known as the citric acid cycle or tricarboxylic acid (TCA) cycle, it is a series of chemical reactions that occur in the mitochondria, involved in the production of energy from carbohydrates.

French plays a crucial role in contributing terms related to pharmacology and medical biotechnology. Examples of terms borrowed from the French language include terms: "à la carte cloning" is describing the ability to selectively choose and manipulate genes during the cloning process; anesthésie (anesthesia, French): the induced loss of sensation or awareness, often used to facilitate medical procedures or surgery; posologie (dosage, French): the science of determining the appropriate dosage of a medication, including factors such as frequency and duration; pharmaceutique (pharmaceutical, French): relating to drugs or medications, particularly those used in medical treatment.

With advancements in biotechnological research originating in Japan, Japanese terms related to biotechnology have found their way into English usage. Example, the term "kanban" from Japanese, originally referring to a visual scheduling system, has been adopted in biotechnological production processes.

Some terms result from a combination of elements from multiple languages, creating hybrid terminology, for example, the term "pharmacogenomics" is a hybrid of Greek and English, merging "pharmakon" (drug) and "genomics" to describe the study of how an individual's genetic makeup influences their

response to drugs. The term “gel electrophoresis” (gel, German + electrophoresis, Greek) is a technique for separating and analyzing macromolecules (such as DNA, RNA, or proteins) based on their size and charge using an electric field.

As a rule, borrowed terms in the English biotechnological terminology are international in nature. The internationalization of English biotechnological terminology mirrors the dynamic processes actively shaping and occurring within various fields of biotechnology. This becomes especially crucial in contemporary circumstances, where new scientific directions are constantly emerging. An analysis of borrowed and international terms within the realm of biotechnological terminology reveals a clear distinction between a hybrid model of term formation and the Greek and Latin models prevalent in modern biotechnological terminology.

The etymological composition of neologisms and emerging biotechnological terms underscores a noticeable trend toward hybridization. Models of hybrid origin prove to be particularly productive in crafting complex terms and terminological phrases within biotechnological terminology. This tendency towards hybridization is observable across all levels of term formation. Among borrowed terms, those of Greek or Latin origin stand out, with terms of Latin and Greek origin forming the static core of the terminological system of biotechnology. Hybrid terms, in contrast, are situated on the periphery of the system.

Hybrid terminology in biotechnology often involves the combination of terms from different scientific disciplines or the adaptation of existing terms to new contexts. Here are some examples of borrowed hybrid terminology in biotechnology. The term "pharmacogenomics" is a hybrid of Greek and English, merging "pharmakon" (drug) and "genomics" to describe the study of how an individual's genetic makeup influences their response to drugs.

Bioinformatics (Biology + Informatics) is the use of computational techniques and methods to analyze biological data. Pharmacogenomics (Pharmacology + Genomics) is the study of how an individual's genetic makeup influences their response to drugs. Nanobiotechnology (Nanotechnology + Biotechnology) is the application of nanotechnology principles to biological systems for various purposes. Phytoremediation (Phyto- + Remediation) is the use of plants to remove, degrade, or immobilize environmental contaminants. Biofabrication (Biology + Fabrication) is the production of biological materials or systems using engineering principles. Pharmacokinetics (Pharmakon, Greek + Kinesis, Greek) is the study of how the body processes a drug, including its absorption, distribution, metabolism, and excretion. Immunoglobulin (Immune, Latin + Globulin, Latin): proteins produced by plasma cells that function as antibodies to neutralize pathogens. Recombinant DNA (Recombinare, Latin + DNA, English): DNA that has been artificially created by combining genetic material from different sources.

These examples illustrate how hybrid terminology in biotechnology frequently incorporates elements from Latin, Greek, and other languages, crafting terms that effectively encapsulate intricate scientific concepts.

Linguistic borrowings in biotechnology terminology, akin to any specialized field, occur for diverse reasons. These borrowings frequently stem from the necessity to articulate novel concepts, technologies, and discoveries that arise with the ongoing evolution of the field. Key reasons for linguistic borrowings in biotechnology terminology include:

1. Scientific Advancements. As biotechnology continues to advance, scientists often encounter new phenomena, techniques, and technologies that lack existing terms in the language. Borrowing terms allows for precise and efficient communication about these innovations.

2. International Collaboration. Biotechnology is a global field with researchers, professionals, and companies collaborating across borders. Borrowing terms from different languages facilitates effective communication and standardization in international scientific discourse.

3. Cross-Disciplinary Integration. Biotechnology often integrates knowledge from various scientific disciplines, such as biology, chemistry, physics, and engineering. Borrowing terms from these disciplines helps create a unified and comprehensive terminology.

4. Cultural and Historical Influences. The historical and cultural context of scientific discoveries can influence the choice of terms. For example, the naming of a technique or a gene may be influenced by cultural references or historical events.

5. Technological Convergence. Biotechnology frequently benefits from technological convergence, where technologies from different fields merge to create novel approaches. Borrowing terms helps describe these interdisciplinary technologies accurately.

6. Standardization Efforts. Standardization in terminology is essential for clear communication within the scientific community. Adopting terms that have gained international acceptance helps establish a common language for researchers and practitioners.

7. Economic and Commercial Factors. The biotechnology industry, being commercially driven, may adopt terms that resonate with investors, regulatory bodies, and the public. This can lead to the borrowing of terms that are clear, concise, and easily understood.

8. Educational Purposes. Borrowings often occur to facilitate the teaching and learning of biotechnology concepts. Clear and standardized terminology aids in education and ensures consistency in scientific communication.

9. Global Challenges and Solutions. The global nature of challenges in areas like healthcare, agriculture, and environmental sustainability necessitates the development of shared terminologies. Borrowing terms helps in the dissemination of solutions and best practices.

10. Historical Evolution of Language. Language evolves, and new terms are introduced to reflect changes in society, technology, and knowledge. Borrowing terms is a natural part of this linguistic evolution.

Conclusion. Linguistic borrowings in biotechnology terminology are propelled by the dynamic nature of scientific research, international collaboration, the imperative for clear communication, and the continual evolution of language. These borrowings play a vital role in shaping a nuanced and precise vocabulary that mirrors the advancements and complexities within the field of biotechnology.

The complexity of biotechnology terminology is evident in its incorporation of terms borrowed from various disciplines such as medicine, genetics, chemistry, and ecology, making interdisciplinary borrowing the most prevalent source of its formation. Notably, the English terminology in biotechnology exhibits borrowings from diverse languages, with the study highlighting Greek-Latin, French, and German as common sources. The Greek and Latin languages, in particular, emerge as primary contributors to the enrichment of biotechnological terminology.

This study's findings deepen our insight into the evolution of biotechnological terminology, shedding light on the processes of linguistic adaptation and the dynamic interaction between linguistic and scientific environments in contemporary biotechnological research.

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Іншомовні запозичення біотехнологічної термінології в англійській мові

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Анотація. У статті розглядається проблема лінгвістичних запозичень в англійській термінології біотехнології. Метою дослідження є аналіз запозичень у біотехнологічній термінології англійської мови та виявлення їх основних джерел, які зумовлені як історичними, так і науковими подіями у розвитку суспільства. Об'єктом дослідження є термінологічні одиниці сучасної англійської мови, пов'язані зі сферою біотехнології, відібрані зі спеціалізованих словників, наукових праць з проблем біотехнології, та інтернет-сайтів, присвячених створенню та виробництву нових модифікованих організмів та продуктів. Стаття спрямована на дослідження етимологічних та лінгвістичних аспектів запозичених термінів, аналіз їх походження та адаптації у сфері біотехнології. Етимологічний аналіз висвітлює джерела, що брали участь як у формуванні, так і у розвитку сучасної біотехнологічної лексики англійської мови. Дослідженням встановлено, що, запозичені термінологічні одиниці англійської термінології галузі біотехнології складаються з греко-латинських, французьких та німецьких запозичень. У статті розглядається вплив класичних мов, зокрема латини та грецької, на формування біотехнологічної термінології. Зазначається, що основними джерелами збагачення біотехнологічної термінології вважаються грецька та латинська мови. Аналіз зосереджений на походженні, еволюції та асиміляції біотехнологічних термінів англійською мовою. Крім того, стаття розглядає вплив цих запозичень на зв'язок між науковими інноваціями та еволюцією мови. Результати дослідження розширюють наше розуміння еволюції біотехнологічної термінології та процесів лінгвістичної адаптації та взаємодії між мовним і науковим середовищами в сучасних біотехнологічних дослідженнях.

Ключові слова: запозичення, біотехнологічна термінологія, термінологічний елемент, класичні мови, мовні джерела.