
Research Article

Pharmacophore, syndrome de Noé, tire-veine, and other newcomers in medical terminology. Analysis of official medical neologisms in FranceTerme

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Abstract: The article deals with formal and semantic neological terms in the field of medicine as a domain with a dynamically developing interdisciplinary terminology. The official French terminological database *FranceTerme*, available online, has been used as a corpus: namely a closed group of the 175 terms that have been added since 2011 under the heading *Health and Medicine*. The analysis of formal terminogenic means deals with derivation, composition, abbreviation, syntactic formation, and borrowing, which are commented upon and complemented via relevant examples. The article further deals with semantic neology, manifesting itself as terminologization of words from everyday language and their figurative use. The metaphors detected in the corpus are based both on analogies of form and function, and the most frequently occurring metonymies are based on a cause–effect relationship. The analysis is mainly qualitative, as the variability and multiplicity of terminological means involved in term formation constitute the principal limiting factors for a deeper quantitative analysis.

Keywords: French language, term, terminology, neology, FranceTerme, medicine

1 Introduction

There are few scientific fields that have undergone such a dramatic development in recent decades as medicine. A separate chapter in *Histoire de la langue française 1945–2000* is devoted to medicine (Sournia & Guran, 2000), alongside biology, IT, psychiatry, philosophy, sports, and economics. Developments in infectious medicine, human reproduction, pharmacy, biochemistry, and genetics have brought extensive and systematic enrichment of terminology, and the authors emphasize that medicine has never been paid as much attention in the media as now. According to Cabré (1998, p. 262), a new term may be adopted by institutions of terminological standardization, because: (a) “it is necessary”, (b) “it is widely used”, (c) “it is widespread in the professional environment”, (d) “it has been adopted by general lexicography”, (e) “it has been disseminated by a language organisation”, (f) of “parallelism with other languages”, and because (g) “more valid solutions are missing”. Most of these reasons apply to medical terminology. The concept of term formation is closely connected with the intricate concept of neologism itself, as discussed by Rey (1995, p. 63–84). To determine whether the term is a neologism, Cabré (1998, p. 254) suggests four parameters, which all seem pertinent for our corpus: diachrony (recent creation of the term), lexicography (absence of the term in dictionaries), system instability (formal or semantic instability exhibited by the term), and psychology (perception of the term as a new unit by speakers).

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Much has been said about the role of terminology management, i.e., regulation of terms to facilitate communication (L'Homme, 2004, p. 27), creation of terms where they do not yet exist or where they have been imported, and elimination of competition between terms for identical objects or concepts (Gouadec, 1994, p. 99). Rey (1992, p. 56) reminds that the need for standards applies to any language use, any complex practice, and any transmission of knowledge. A correct form for newly-coined terms is the crucial condition of their viability, which depends, among others, on the adherence to established and productive language-specific models and conventions. These include, according to ISO 704:2009 (International Organization for Standardization, 2009, p. 38–41), (a) transparency, (b) consistency, (c) appropriateness, (d) linguistic economy, (e) derivability and compoundability, (f) linguistic correctness, and (g) preference for the native language.

This article contains some observations on French medical neologisms as recorded in the terminological database *FranceTerme*, and provides mainly a qualitative analysis of the newly-coined terms. Observation of a well-delimited and sufficiently representative sample of neologisms may help to answer the following questions: What are the main formal and semantic processes involved in the formation of official medical terms in French? What is the importance of the respective processes? Does the medical terminology respect the principle of univocity formulated by the traditional terminology, according to which a single concept is designed by a single term and a single term always refers to a single concept? If not, what kind of variants are there and what is their function? For the purposes of our analysis, neological processes are divided between formal (derivation, composition, terminological syntagms, and abbreviation), external (borrowing), and semantic (migration of terms between domains and figurative use of words), which roughly correspond to the classification of Cabré (1998, p. 256–257).

2 *FranceTerme* as a corpus

FranceTerme, containing terminological neologisms recommended by the *Commission d'enrichissement de la langue française*, was launched in 2009 as an implementation of *Décret n°96-602 du 3 juillet 1996 relatif à l'enrichissement de la langue française*.¹ According to its website, its primary mission is to “fill the gaps in scientific and technical vocabulary by identifying the new concepts which generally appear under foreign names, most often Anglo-American, by creating equivalent terms in French” (Ministère de la Culture, 2023). In accordance with its Article 11, by publication in the *Journal officiel* of the French Republic, terms and expressions shall obligatorily replace foreign equivalents “in the decrees, orders, circulars, guidelines, and directives of the ministers, in the correspondence and documents, of whatever nature, emanating from State public services and institutions”². According to the information provided by *FranceTerme* directly to the author, it contained 7 836 separate entries in 76 scientific and technical fields, out of which more than 700 comprise one or more synonyms, i.e., about 9 000 terms as of 31 May 2023. On the same date, there were 175 terms included under heading *Health and Medicine*.

1 For previous terminological standardization in France, see, for instance, Rondeau (1984, p. 112–113) and Humbley (1994, p. 93–96, and 2000a).

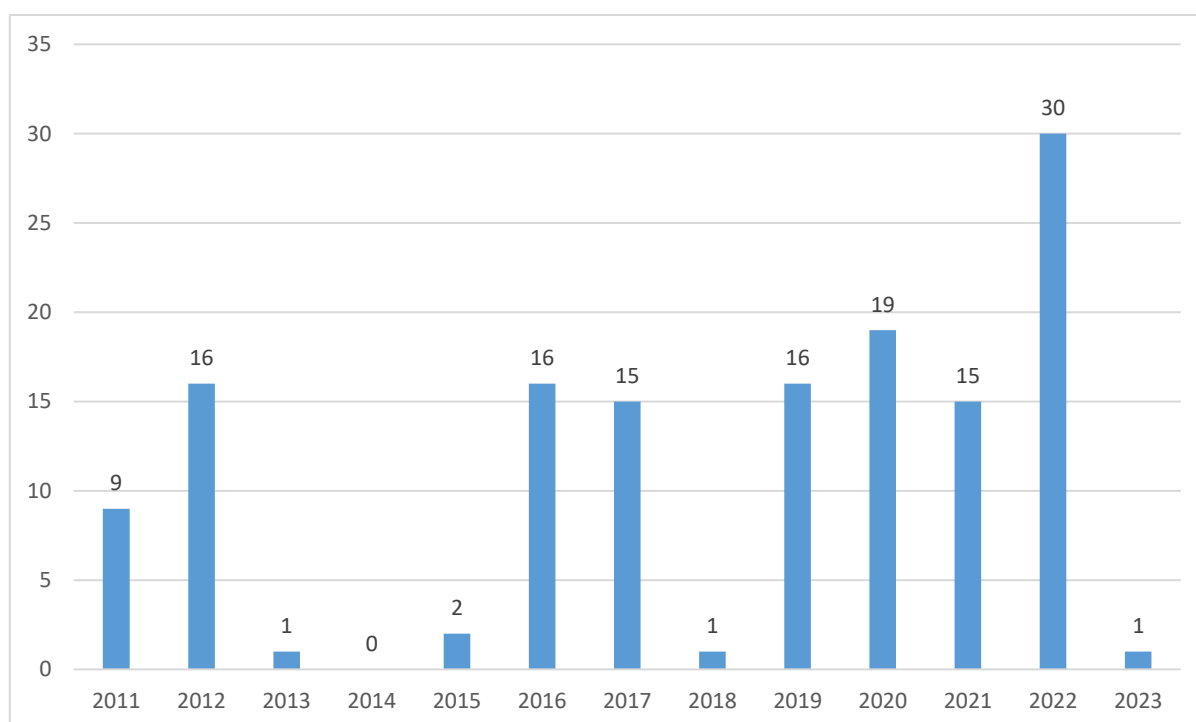
2 Article 11: Les termes et expressions publiés au Journal officiel sont obligatoirement utilisés à la place des termes et expressions équivalents en langues étrangères : 1° Dans les décrets, arrêtés, circulaires, instructions et directives des ministres, dans les correspondances et documents, de quelque nature qu'ils soient, qui émanent des services et des établissements publics de l'État“.

The microstructure of entries is simple and easy to use, containing a headword with basic grammatical information (word class, gender), date of publication in *Journal officiel*, abbreviated form (if any), field, definition, note on use and deprecated equivalents, reference to related entries, and foreign equivalent. The site enables a search by headwords, as well as by fields. The macrostructure includes sections devoted to the enrichment of the French language, the description of French terminological legal framework, terminological resources, suggestion box, etc. In addition, the site provides the recommendations formulated by the *Commission générale de terminologie et de néologie* on the use of French equivalents of certain terms (such as *fake news*, *e-*, *low cost*, *webinar*, etc.). In terms of Cabré et al. (2002), such terms may be designated as planned institutional neologisms, arising from social needs to denominate a concept, contrasting with spontaneous neologisms usually created by an individual and being unconscious.

Chronological distribution of terms added does not seem to reflect any important event in the field of medicine, even if the increased rate of additions in 2020–2022 may be a repercussion of the COVID-19 pandemics³. The most terms were added in 2022 (30); no term was added in 2014.

Figure 1

Chronological distribution of terms added to FranceTerme⁴



3 Terms such as *distanciation sociale*, *distanciation physique*, *identification des contacts* were added in 2020–2022. The term *traçage* “tracking (of contacts)” was included in 2021 under the heading *Telecommunications*.

4 As of 31 May 2023. Terms are being added continuously throughout the year.

3 Formal neology

Classifications of neologisms abound in the linguistic literature, and it is not the aim of this paper to enter a theoretical debate on the existence and nature of their respective types. In a simplified version, Pruvost and Sablayrolles (2003, p. 100–119) distinguish (a) morphosemantic matrices (affixation, composition, blending), (b) syntactic-semantic matrices (conversion, metaphor, metonymy), (c) morphological matrices (clipping, initialisms), (d) pragmatic matrix (neological use of phraseology), and (e) external matrix (borrowing). For Kocourek (1982, p. 86–146), formal neology consists of derivation, confixation, composition, syntagmatic formation, borrowing, and abbreviation. Dubuc (2002, p. 118–129) suggests a distinction of (a) indirect formation (semantic changes, grammatical modifications, as changes of category, gender, number, status, external and internal borrowing), and (b) direct formation (derivation, composition, abbreviation). Rey (1995, p. 82) distinguishes (a) already existing forms, (b) morphological creations (general morphology, “learned” morphology), (c) borrowings, and (d) abbreviations and acronyms. For the analysis of formal neology, the terms derivation, abbreviation, composition, syntactical formation, and borrowing will be used.

As far as word classes are concerned, all the terms were nouns, except for seven adjectives (*axénique*, *anorexigène*, *cardial* / *cardiale*, *floride*, *inducteur* / *inductrice*, *œstrogénomimétique*, *optogénétique* (marked as noun and adjective), *obésogène* / *obésigène*). In addition, the corpus contained three adjectival syntagms (*vierge de tout traitement*, *(de) santé globale*, *(en) circuit rapide*) and one verb (*doper*).⁵

3.1 Derivation

Derivation, i.e. use of affixes adjoined to a lexical base, ranks among the most productive terminological processes in medicine. Some nominal suffixes tend to specialize in designating certain concepts, such as *-ose* for animal parasitic diseases (*toxoplasmose*)⁶, *-ite* for inflammation (*nephrite*), or *-ome* for tumours (*lymphome*). The corpus contains terms formed with a wide array of nominal suffixes, with the use of which the terms are formed from verbs, adjectives, and nouns. Out of them, the first mentioned type is particularly frequent. The deverbal suffixes are used in nouns designating “action” and its “result”, such as *-ade* (*cabrade*, *claquade*), *-age* (*corbeillage*, *éveinage*, *lissage*, *rinçage*, *rodage*, *trappage*), *-ance* (*compliance*, *clairance*, *guidance*, *hémovigilance*, *pharmacorésistance*, *pharmacovigilance*), *-ation* (*organification*, *téléconsultation*, *translocation*), *-ement* (*festonnement*, *rétablissement*). The deverbal suffix *-eur* is used for devices (*absorbeur*, *moniteur*, *stimulateur*). The denominal suffix *-ie* is used to form conditions and scientific fields (*anancurésie*, *alcoolorexie*, *radiochirurgie*). The suffix *-ique* serves to form names of disciplines and types of drugs (*éligobiotique*, *pharmacogénétique*, *pharmacogénomique*). The denominal *-isme* is used to form a name of certain type of behaviour (*catastrophisme*), *-iste* for names of persons performing a certain activity (*urgentiste*), *-ité* for abstract nouns from “learned” adjectives (*comorbidité*, *explosivité*, *incompatibilité*, *multimorbidité*, *pharmacosensibilité*, *radiotoxicité*),

⁵ Adjectives contained in nominal syntagms (*entraînement cardiovasculaire*, *étude autocomparative*, *radiochirurgie en conditions stéréotaxiques*, etc.) are not considered.

⁶ However, suffix specialization is not systematic by far; see, for instance, *bilharziose*, caused by the *Schistosoma* genus and named after its discoverer Theodor Bilharz; or *exposome* (in the corpus): “ensemble des facteurs environnementaux auxquels est exposé un organisme vivant de sa conception à sa mort et qui influencent son état physiologique”. Similar specialization of terms is observed in biology and chemistry.

and *-ome* for a name of a set of factors (*exposome*). The same and several others are found in words forming part of terminological syntagms, such as *-ase*, used for enzymes, and *-ine*, for chemical substances (*désaminase de l'adénosine*), *-erie*, very frequent in contemporary French and forming, among others, names of activities and their results (*beuverie express*, *autopsie par imagerie*). The term *claquade* has been derived from onomatopoeic *claquer*.⁷

Adjectival suffixes, including *-al/-ale* (*cardial*), *-ique* (*axénique*, *œstrogénomimétique*, *optogénétique*), and *-ide* (*floride*), are less frequent due to the sparsity of adjectives in the corpus. However, others could be seen in terminological syntagms, such as *-aire* (*entraînement cardiovasculaire*, *point de contrôle immunitaire*), *-ant/-ante* (*médecine fondée sur des données probantes*), *-ien/-ienne* (*quorum bactérien*), *-ier/-ière* (*pôle hospitalier*), *-ifl/-ive* (*étude autocomparative*, *coloscopie non intrusive*), and *-oire* (*réadaptation respiratoire*).

Prefixation of vernacular words is sporadically represented, as in *déconnexion*, *décorporation*, *éveinage*, *incompatibilité*, *réadaptation cardiovasculaire / respiratoire*, *réathlétisation*, *rétablissement*, as well as in the adjective *axénique*. Greco-Latin prepositions as in *désaminase*, *hyperphagique*, *innocuité*, *antisénescent*, and *translocation* have been considered as parts of compounds.

The term *aidant* is the only case of zero derivation (or conversion) in the corpus, even if the terms *antisénescent*, *maïeutique*, *pharmacogénétique*, *pharmacogénomique*, *optogénétique*, and *pharmacophore*, labelled as nouns, may also assume the function of adjectives. This ability is mentioned only in the last two terms. Reciprocally, *inducteur*, labelled as an adjective, may be used as a noun.

3.2 Composition

Only two examples of compounds *stricto sensu* (compounds of vernacular words) have been detected, namely *faire-face* and *tire-veine*. Both are Verb-Noun compounds, which is a very productive pattern in French. One compound adjective from vernacular preposition and noun has been detected in the terminological syntagm *espace intercuise*. A meticulous diachronical analysis would probably reveal others, as in *gestes de sauvegarde*, in which *sauvegarde* contains the adjective *sauve* and noun *garde*.

On the contrary, the “learned” or *allogenic* composition, as Guilbert names it (1975, p. 224–238), consisting in the use of elements from classical languages, ranks among the privileged word formation processes in terminology thanks to its ability to express very complex scientific meanings (Bozděchová, 2009, p. 70) and their international nature (Pruvost and Sableyrolles 2003, p. 106). Terms are sometimes composed from two Greek bases (*biothèque* from *bios* and *theke*); sometimes they are hybrid, either Greco-Latin (*vulnology* from Latin *vulnus* and Greek *-logia*), or Greco-vernacular (*pharmacovigilance* and *téléconsultation*). They usually consist of two formants, but they may be more complex (*œstrogénomimétique* from *oistros*, *genos* and *mimetikos*, *xénœstrogène* from *xenos*, *oistros* and *genos*).⁸ Benveniste (1974, p. 163–170) considers them as one of the two new forms of nominal composition, predicting a great future for them in scientific terminology. According to this author, these words cannot be considered

⁷ Imitative sources of terms seem marginal, but not absent in terminology. Compare, for instance, terms such as *cliquer* in IT, *ping-pong* in sports, *big bang* in astrophysics, *murmure (systolique)* in cardiology, *couac* in astronomy, and imitative bird names (*pigeon*, *coucou*, *coua*).

⁸ The corpus does not contain terms composed from more than three components, even if longer compounds exist in medical terminology, such as *uvulo-palato-pharyngoplastie*, *œsogastroduodénoscopie*, *pseudopseudohypoparathyroïdie*, etc.

borrowings from Greek, but are fully-fledged French words “dressed in Greek and Latin”. Kocourek (1982, p. 108–110) designates their front and back “learned” bases as *confixes*.

Whatever term we use for this type of terminology, it is clearly one of the most preferred ways of new medical term formation. In addition to the above-mentioned terms, the corpus contains *alcoolorexie*, *autodidaxie*, *biophotonique*, *biothèque*, *coloscopie*, *écotropisme*, *hémovigilance*, *neuroprothèse*, *oculométrie*, *optogénétique*, *orthobiologie*, *phagogramme*, *pharmacophore*, *remnographie*, *tépographe*, etc. Grevisse (1993, p. 234) remarks that the first component usually ends in *-o*, according to the model of Greek compounds. This rule is not universal, however, and the corpus contains terms such as *anancurésie*, *anorexigène*, *cervicalgie*, *gastrectomie*, and also *obésigène* as a formal variant of *obésogène*. This type of composition equally involves adjectives forming parts of longer terminological syntagms, such as *cardiovasculaire*, *stéréotaxique*, *hypofractionné*, *médico-sanitaire*, *post-traitement*, *post-traumatique*, *auto-infligé*.

Besides the diachronic distinction between vernacular and “learned” composition, we can distinguish between closed and hyphenated terms, although the use of hyphen is often “aleatory and uncertain” in French, as reminded by Kocourek, mentioning the examples as *eau-de-vie* / *niveau de vie* or *mort-aux-rats* / *marché aux puces* (1982, p. 111–112). Open, non-compositional compounds are considered terminological syntagms and will be dealt with in the following subchapter. However, in some cases, as in *anxiété écologique* / *écoanxiété* or *oculomètre* / *moniteur oculaire*, open and closed terms may alternate.

3.3 Terminological syntagms

Terminological syntagms likely represent a very popular way of forming new terms. These are combinations of words following a syntactic structure (Cabré, 1998, p. 155–156). The syntagms containing junction words such as *de* or *à*, having a fixed order of members, and a unique and constant meaning are called *synapsies* by Benveniste (1974, p. 171–176), who considers them, in addition to the “learned” compounds mentioned above, as the second new phenomenon in French nominal composition. Many terms in the corpus fulfil these criteria (*cahier de recherche formalisé*, *cervicalgie du mobile*, *effet de proximité*). Bozděchová (2009, p. 60–64) uses *terminological collocation* instead, and Kocourek (1982, p. 117) enumerates 25 other expressions to designate terms consisting of more than one component. In order to avoid terminological debate, *syntagm* is used throughout this text, complemented with the adjective *terminological* to distinguish it from occasional collocations.

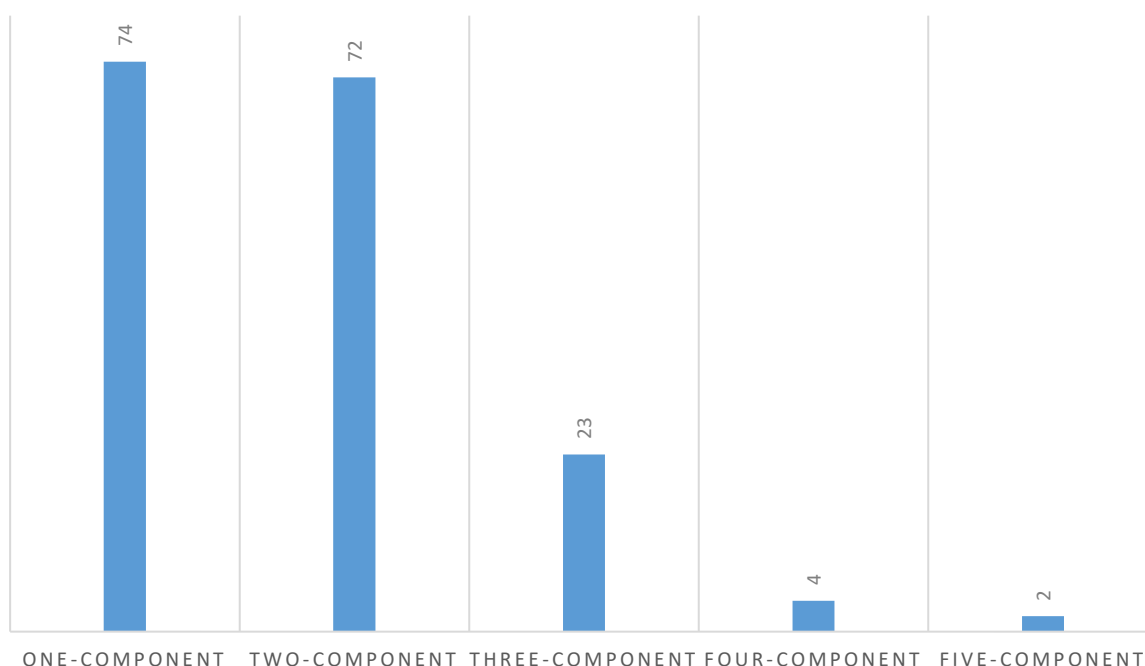
The corpus contains 74 (42%) one-component terms (such as *écotropisme*, *hormésis*, *faire-face*) and 101 terminological syntagms (58%). Among the latter, there are 72 two- (*médecine génomique*, *gestes de sauvegarde*, *médicament sans ordonnance*), 23 three- (*mise sous cocon vaccinal*, *point de contrôle immunitaire*, *radiochirurgie en conditions stéréotaxiques*), and 4 four-component terms (*médecine fondée sur des données probantes*, *unité pour les accidents vasculaires cérébraux*, *troubles liés aux jeux vidéo*), not counting synsemantic connectors such as *de*, *à*, *sous*, and *sans*. There are also 2 five-component terminological syntagms if long-form synonyms are considered, namely *contrôleur naturel du VIH* (*virus de l'immunodéficience humaine*) and *contrôleur post-traitement du VIH* (*virus de l'immunodéficience humaine*).

Terminological syntagms involve diverse patterns, such as N ← Adj (e.g. *circuit rapide*, *coloscopie non intrusive*, *maladie rare*) and N ← N (e.g. *cervicalgie du mobile*, *autogestion de la santé*, *bandage de contention*) for two-component syntagms; (N ← Adj) ← N (e.g. *algie vasculaire de la face*), (N ← Adj) ← Adj (e.g. *étude épidémiologique transversale*, *essai clinique*

contrôlé), (N ← N) ← Adj (e.g. *cahier de recherche formalisé*, *point de contrôle immunitaire*), N ← (N ← N) (e.g. *autodidaxie en matière de la santé*, *interruption de la détection du quorum*), N ← (N ← Adj) (e.g. *augmentation de l'être humain*, *dopage par sévices auto-infligés*, *syndrome d'épuisement professionnel*), and N ← Adj ← N (e.g. *données rapportées par le patient*, *expérience rapportée par le patient*) for three-component syntagms; N ← Adj ← (N ← Adj) (e.g. *test groupé sur échantillons mélangés*, *médecine fondée sur des données probantes*) for four-component syntagms; and N ← Adj ← (N ← (N ← Adj)) (e.g. *contrôleur naturel du virus de l'immunodéficience humaine*, *contrôleur post-traitement du virus de l'immunodéficience humaine*) for five-component syntagms.

Figure 2

Single and complex terms in FranceTerme



3.4 Abbreviation

Considering the linguistic economy abbreviations bring, they are extremely popular in terminologies and particularly in written discourse. The corpus contains 10 initialisms functioning as formal synonyms (e.g. *cahier de recherche formalisé* – *CRF*, *expérience rapportée par le patient* / *expérience des soins rapportée par le patient* – *ERP*, *médecine fondée sur des données probantes* – *MDP*, *réadaptation respiratoire* – *RR*). Initialisms also form part of terminological syntagms, as in *unité pour les accidents vasculaires cérébraux* – *unité AVC*, *contrôleur naturel du VIH* – *contrôleur naturel du virus de l'immunodéficience humaine*. In addition, the corpus contains the acronym *EVAMED*, an amalgam of *évacuation médicale*, pronounced as a single word.

Initialisms, including those identified in the corpus, manifest a high level of homonymy, which is, however, interdisciplinary which excludes misunderstanding (Bozděchová, 2009, p.

68). In addition to their medical meaning, the same initialisms are found in other fields beyond the corpus.⁹ They may become a source of derived terms, usually adjectives, as seen in *sidéen / sidéenne* and *sidatique*, or *covidien / covidienne*, which, however, have not been included in the corpus.¹⁰

4 External neology

By external neology, we mean true borrowings and calques, i.e. loan translations (Cabré, 1998, p. 207). As Humbley (2000b, p. 89) remarks, the external neology in French of the last decades is practically synonymous with the influence of English and even terms such as *ombudsman*, *kitsch*, and *macho* – originating in Swedish, German, and Spanish – have probably been borrowed through English. In the terminology, it is convenient to distinguish between the source language, usually English,¹¹ and the language of origin, often Greek or Latin in the case of medical terminology. The co-existence of a vernacular and a borrowed term is typical for medicine, which “belongs” to professionals (doctors) as well as to laymen (patients) at the same time, and therefore has a vocabulary of both scientific and quotidian nature (Kacprzak & Goudaillier, 2014, p. 1). The existence of scientific and vernacular terms results in terminological synonymy (visible in the corpus, as in *chirurgie digestive de l’obésité – chirurgie bariatrique*, *médecine de l’obésité – médecine bariatrique*, *oculométrie – monitoring oculaire*, *oculomètre – moniteur oculaire*). Dubuc (2002, p. 122) distinguishes integral borrowings (transplantation of a term without formal modification, e.g. *goodwill*), xenisms (integral borrowing referring to a foreign reality, e.g. *perestroïka*), calques (literal transposition of a foreign linguistic form, e.g. *flux monétaire* from *cash flow*), adapted borrowings (foreign linguistic form becomes adapted to the morphology of the borrowing language, e.g. *mastère* from *master*), and false borrowings (term formed from morphological elements of a foreign language, but not existing as such in the source language, e.g. *badwill* instead of *negative goodwill*), out of which the corpus contains adapted borrowings and calques.

The terms contained in the corpus are mostly English borrowings (often Greco-Latin), adapted either phonetically (*clairance* ← *clearance*, *compliance* ← *compliance*, *guidance* ← *guidance*, *hémovigilance* ← *haemovigilance*, *organification* ← *organification*, *pharmacophore* ← *pharmacophore*, *téléconsultation* ← *teleconsultation*), or morphologically (*comorbidité* ← *comorbidity*, *dopage* ← *doping*, *pharmacogénomique* ← *farmacogenomics*, *vulnologie* ← *vulnology*).

For Kocourek (1982, p. 136), calque is one of the most effective neological processes “if one knows how to use it”, and, for Candell (2000, p. 358), it is a “natural solution” to the “francization” of scientific language. The corpus contained frequent calques, either complete (such as *collimateur multilame* ← *multileaf collimator*, *évacuation médicale* ← *medical evacuation*, *maladie rare* ← *rare disease*, *radiochirurgie* ← *radiosurgery*, *point de contrôle immunitaire* ← *immune checkpoint*, *médicament orphelin* ← *orphan drug*, *radiothérapie hypofractionnée* ← *hypofractionated radiotherapy*, *rinçage* ← *washout*, *santé communautaire* ← *community health*), or partial (*radiochirurgie en conditions stéréotaxique* ← *stereotactic*

9 E.g. *CRF* “Croix-rouge française”, *ERP* “évaluation des risques professionnels”, *MDP* “mécanisme de développement propre”, *RR* “route régionale”, etc.

10 Compare *covidologue*, *covidisme*, and other derived, compound, or blended neologisms, often ephemeral and ludic (see, for instance, Kolářiková, 2021; Woch, 2021; Piraro, 2022).

11 Borrowings from other languages are rather exceptional in medicine, even if they exist, such as *malaria* from Italian, or *beriberi* from Sinhalese.

radiosurgery, radiothérapie en conditions stéréotaxiques ← *stereotactic radiotherapy*). In addition, many metaphors mentioned below also result from calquing.

Presumed calques may be misleading, as in the case of *suffisance alimentaire*: “situation dans laquelle une population déterminée dispose de la quantité nécessaire d’aliments variés pour assurer durablement sa nourriture”, corresponding to *food security*, whereas no English equivalent is given for *sécurité alimentaire*: “situation dans laquelle une population bénéficie à la fois de la suffisance alimentaire et de l’innocuité des aliments”.

For some medical neologisms, such as *catastrophisme, corbeillage, éligobiothique, phagogramme, pôle hospitalier, réathlétisation, tépographe, translocation, or urgentiste, FranceTerme* does not mention any foreign equivalent. According to *Rapport annuel 2021* (Délégation générale à la langue française et aux langues de France, 2021, p. 39–40), such terms are more frequent in the fields of the environment, transportation, and nuclear energy, where the influence of English is less massive, and where, probably, the administrative management has more influence than the corporations which are frequent “suppliers” of anglicisms.

5 Semantic neology

Semantic neology in the field of terminology consists of the terminologization of words from everyday language (e.g. *chambre cardiaque*) and the use of units from other fields (e.g. *valve cardiaque*). Reciprocally, some terms also migrate beyond their field of specialization and penetrate the day-to-day language being used, often figuratively and imprecisely, as synonyms of words from the general vocabulary. This happens particularly to terms from highly medialized fields, such as space exploration, pandemics, nuclear power, the military, etc. The following titles of articles in online newspapers are witness to the determinologization (also called *banalization*) of certain medical terms: “En Tunisie, un documentaire *ressuscite* Henri Tibi, chanteur bohème et poète de l’exil” (*Le Monde*, 8 April 2023), “Le *cancer* de la France, c’est le chômage, pas l’assistanat” (*L’Express*, 9 May 2011), “Les médecins face à une *épidémie* de violence” (*La Provence*, 3 August 2022). For other examples of determinologization of French medical terms, see Holeš and Honová (2023).

5.1 Terminologization and transterminologization

The process of terminologization results in the polysemy of a word, which acquires a new, terminological meaning. The meaning does not change entirely, but it undergoes a semantic specialization. The corpus contains several examples of this type, such as *rétablissement*, for which *Dictionnaire de l’Académie française* registers the general meaning “action de rétablir quelqu’un, ou fait de se rétablir, dans un statut, une position”. In psychiatric terminology, it acquires the meaning “processus d’amélioration de l’état de santé d’une personne atteinte de troubles psychiatriques, qui lui permet de récupérer le meilleur niveau d’autonomie possible pour mener une vie sociale, en dépit de symptômes résiduels” and is differentiated from *guérison*, which implies a complete disappearance of symptoms. Other terms, in which a general and a specialized meaning is registered by *Dictionnaire de l’Académie française* and *FranceTerme*, include *rinçage*: “action de rincer quelque chose” and “procédé d’élimination ou de dilution d’une substance indésirable dans l’organisme, qui consiste généralement en l’administration d’un fluide”, and *lissage*: “action de lisser ; résultat de cette action” and “technique chirurgicale destinée à supprimer les rides du visage”.

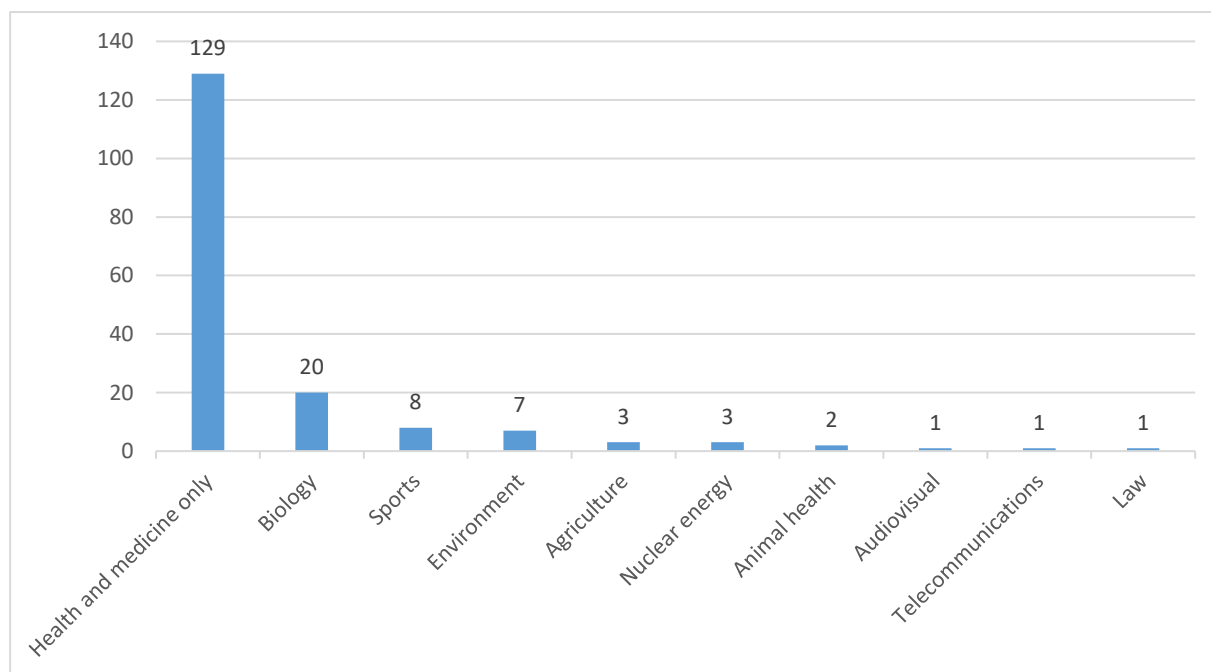
Terms can also migrate to other specialized fields. Gostkowska (2010) underlines the role of an intense scientific interdisciplinarity for the transfer of terms across fields. For instance, *FranceTerme* registers the terminological meaning of *cellule* under the following headings: biology, telecommunications, electronics, nuclear energy, chemistry, international relations, remote sensing, environmental studies, tourism, and the automotive industry. Migration of a term from one field to another field is also called *internal borrowing* by Dubuc (2002, p. 123), or *transterminologization* by Bozděchová (2009, p. 56).

Polysemy is generally undesirable within the terminology of a single field, contradicting the nature of a term as an unambiguous unit having, ideally, a single meaning. The corpus contains one polysemic term, *translocation*, within two separate entries under the same heading, with the following meanings: “opération chirurgicale consistant à modifier le trajet d’un tendon pour en changer la fonction” in surgery, and “aberration chromosomique consistant en la cassure d’un segment de chromosome qui se fixe sur un chromosome non homologue” in medical genetics.

Out of the 175 terms listed under *Health and Medicine*, 46 were ranged under more than one heading. *Biology*, a field narrowly linked with medicine, was the most frequent (e.g. *biothèque*), followed by the *Environment* (e.g. *anxiété écologique*). The remaining fields included *Sports* (e.g. *entraînement cardiovasculaire*), *Defence* (e.g. *augmentation de l’être humain*), *Nuclear Energy* (e.g. *radiotoxicité*), *Agriculture* (e.g. *innocuité des aliments*), *Animal Health* (e.g. *grippe aviaire*), *Law* (*médecine légale*), *Telecommunications* (*identification des contacts*) and, curiously enough, *Audiovisual Technology* (*troubles liés aux jeux vidéo*).

Figure 3

Interdisciplinarity of terms in FranceTerme



5.2 Figurative terms

Figurative use of terms is well-established in terminology and may fulfil several functions in specialized discourse (e.g. denominative, heuristic, explicative). A traditional approach perceives metaphor as “the use of a concrete word to express an abstract concept without any element formally introducing a comparison” (Dubois et al., 1973, p. 317). The same authors define metonymy as a phenomenon by which a word is replaced by another, based on a relationship of cause–effect, matter–object, container–content, or part–whole. Less explored in terminology and less visible in discourse than metaphors, metonymies involve two elements that are “closely related to each other in conceptual space”, in contrast to metaphors involving two concepts that are similar, but “distant from each other in our conceptual system” (Kövecses, 2010, p. 175).

Bozděchová (2009, p. 98–99) and Poštolková (1979) suggest several classifications of terminological metaphors, and Dubuc (2002, p. 120) distinguishes *analogy of form* and *analogy of function*, the terms that will be used in the rest of the chapter. Examples of analogy of form extracted from the corpus include *étude croisée*, *étude épidémiologique transversale*, *étude pivot*, *mise sous cocon vaccinal*, and *grappe* (as a significant group of infected individuals). Metaphors based on analogy of function include *cible thérapeutique*, *syndrome de Noé* (pathological housing of a large number of animals in unsuitable living and hygienic conditions), *médicament orphelin*, *maladie orpheline*, *parenthèse thérapeutique*, and *point de contrôle immunitaire*. The adjectival phrase *vierge de tout traitement* (referring to a patient without any prior treatment of the given disease), as well as the deprecated adjective *naïf/ naïve* in the same meaning, belong equally to this type.

Terminological metaphors often result from calquing, which may be complete (*orphan drug*, *orphan disease*, *pivotal study*, *therapeutic target*, *immune checkpoint*), or partial (*cross-over trial*, *cocooning*). Some metaphors seem to be original French creations and do not correspond to English metaphors (*syndrome de Noé* – *animal hoarding*), or they correspond to different metaphors (*vierge de tout traitement* – *treatment-naïve*, *parenthèse thérapeutique* – *drug holiday*). On the contrary, some English metaphors have been lost in their French equivalents (*référence standard* – *gold standard*, *syndrome d'épuisement professionnel* – *burn-out*, *test groupé sur échantillons mélangés* – *pooling*).

Terminological metonymies involve various logical relationships, such as concrete–abstract, material–object, sign–signified, part–whole, cause–effect, container–contents (Dubuc, 2002, p. 119). In addition, medical terminology contains a vast group of terms formed from proper names of persons and places, generally based on discoverer–discovery relationship (*syndrome de Korsakoff*, *Creutzfeldt-Jakob disease*), or place–product relationship (*Japanese encephalitis*). However, the corpus contained especially terms based on cause–effect relationships, in which a term designates “action” as well as its “result”. Terms of this type included *hémovigilance*: “surveillance relative à l’utilisation thérapeutique des produits sanguins, exercée depuis la collecte du sang et de ses composants jusqu’au suivi des patients transfusés, afin de recueillir et d’évaluer des informations sur les effets inattendus ou indésirables de ces produits et d’en prévenir l’apparition” and “dispositif et ensemble des moyens permettant cette surveillance”, *pharmacovigilance*: “activité consistant à enregistrer et évaluer les réactions résultant de l’utilisation des médicaments, afin d’assurer leur sécurité d’emploi dans des conditions normales d’utilisation” and “dispositif et ensemble des moyens permettant cette surveillance”. The metonymy based on a part–whole relationship (considered as synecdoche by some) could be seen in *identification des contacts* where specific persons are

meant by *contacts*. *Grippe aviaire*, another term attested in the corpus, in which a phenomenon characteristic to animals is used for a disease affecting humans, seems to be another type of metonymy (Bozděchová, 2009, p. 99–100).

6 Conclusions

All the three types of the term formation – formal, external and semantic – outlined in the introduction have been attested in the corpus. The multiplicity of terminological means involved in term formation further complicates their deeper quantitative analysis, since quantification would not avoid duplicities and triplicities. As Pruvost and Sablayrolles (2003, p. 99) note, the fact that several matrices can be associated in the production of a new unit has not been traditionally and sufficiently considered. Derived words such as *beuverie (express)* form part of a terminological syntagm; *maïeutique* is a case of derivation and borrowing at the same time; and some others, such as *anancurésie*, may involve borrowing, compounding, and derivation.

At least some of the results may be generalized in order to answer the question relating to their importance. First, it is the formation of terminological syntagms, representing the prevailing terminogenic process, accounting for most of the terms (58%). Furthermore, a quarter of the terms are one-word neologisms from Greco-Latin elements, which are typical for the medical language, and other Greco-Latin terms form part of terminological syntagms. In addition, there are frequent English borrowings consisting in adaptations and a number of calques of English terms. These are common in the so-called secondary term formation, which occurs when new terminology (English) is transferred to another linguistic community (French) (Sager, 1990, p. 80, and Humbley, 2012, p. 113). However, determination of their exact number would require the diachronical analysis of each of them. On the contrary, vernacular compounds and initialisms are relatively rare, the latter being always given as variants of full forms. Deverbal suffixation predominates in the derivation of terms which are usually of nominal nature. Semantic means seem to be less frequent than formal means, maybe because the medical language tends to be as precise and as concrete as possible, in comparison, for instance, with the language of social sciences. Some 13 evident metaphors and 3 metonymies are attested.

A detailed quantitative analysis of the corpus would have to cope with another obstacle, consisting in the variability of terms which was subject of the last of our questions. Faulstich (2001) distinguishes concurrent variants (syntactical, morphological, graphical, geographical, and chronological), co-occurrent variants (terminological synonyms), and competitive variants (domestic and borrowed). This variability is observable throughout the corpus: there are eight cases of short-form, long-form and graphical variants (such as *contrôleur naturel du VIH / contrôleur naturel du virus de l'immunodéficience humaine, expérience rapportée par le patient / expérience des soins rapportée par le patient, phagogramme / bactériophagogramme, obésogène / obésigène*), 25 terms labelled as synonyms (such as *circulation générale / grande circulation, autopsie par imagerie / virtopsie, cervicalgie du mobile / torticolis du mobile*), some of them being in fact the third type of variation mentioned by Faulstich.

Sometimes, the use of some variant terms will depend on the user's individual preferences, as in *xénoœstrogène / xénœstrogène* or *obésogène / obésigène*, but in some cases, the selection of a concrete term will be given by the degree of the discourse formality. Greco-Latin compounds are more likely to occur in formal situations than domestic words which are more transparent for the users, e.g. *médecine de l'obésité / médecine bariatrique* or *radiothérapie hypofractionnée / radiothérapie en nombre réduit de séances*. In addition, the alternation of

variants may be purely contextual, as Sager points out (Sager, 1990, p. 58), when shorter forms of compound nouns occur in running text to avoid repetition of long forms, as *médicament analogue / analogue* or *données rapportées par le patient / données de santé rapportées par le patient*. The efforts for economy explain the use of initialisms instead of full forms, e.g. *médecine fondée sur des données probantes / MDP*.

The 175 terms under the heading *Health and Medicine* represent 2.23% out of the total of 7836 terms included in the database as of 31 May 2023. All of them are neologisms resulting from institutional coinage, recommended by the *Commission d'enrichissement de la langue française*, published in *Journal officiel* and, subsequently, included in *FranceTerme*, thus becoming compulsory for French public services and establishments. Whether a new term survives or not is a matter of various linguistic factors, such as the adherence to productive linguistic models. Dubuc (2002, p. 130) remarks that the willingness to accept a neologism is often capricious, sometimes conditioned by extralinguistic factors, such as its diffusion by prestigious media.

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