



Universidad de Valladolid

FACULTAD de FILOSOFÍA Y LETRAS
DEPARTAMENTO de FILOLOGÍA INGLESA
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TRABAJO DE FIN DE GRADO

Effective Tools for Translating Popular Science

Diana de Miguel García

Tutor: Paula de Santiago González

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ABSTRACT

This final degree project deals with the translation of three popular science articles about Alzheimer's disease from Spanish to English. As a starting point, an analysis of the source texts will be performed in order to identify their main characteristics. In order to translate the cited texts, a translation memory tool will be used. For this purpose a translation memory will be created following the characteristics of the source texts. Moreover, other tools such as specialized glossaries and different type of corpora will be used to find or confirm appropriate term equivalents and collocations. Apart from providing the resulting translations, difficulties encountered during the translation process will be explained and a self-made glossary will be presented.

Keywords: Translation memory, corpus, terminology, glossary, popular science article, Wordfast Pro.

Este trabajo de fin de grado consiste en la traducción de tres artículos científicos divulgativos, que tratan sobre la enfermedad del Alzheimer. Para la elaboración de este trabajo, primero se analizarán los tres textos originales con el fin de identificar sus principales características. Para traducir los textos se usará una herramienta de traducción automática, que permite utilizar a su vez una memoria de traducción y un glosario. Para ellos se elaborará una memoria de traducción, cuyos textos se escogerán siguiendo las características de los textos originales. Además, se utilizarán otras herramientas, como glosarios especializados y diferentes tipos de corpus, para buscar o confirmar términos equivalentes apropiados y colocaciones. Además de ofrecer las traducciones, se explicarán las dificultades que se encuentren en el proceso de traducción, y también se presentará un glosario creado para este trabajo.

Palabras clave: Memoria de traducción, corpus, terminología, glosario, artículos científicos divulgativos, Wordfast Pro.

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1. Introduction

Nowadays, translation of medical texts is gaining importance due to the fact that new advances in biology and medicine are produced every day. As stated by Vladimir de Semir and Gemma Revuelta (2002: 61-81), since the late 19th century newspapers have introduced articles related to scientific news, particularly experiments and theories that rejected or confirmed other previous theories. However, there was not a fixed section for science on the journals until early 20th century, when the author of each article started to be stated. It was the birth of atomic energy what consolidated science journalism in newspapers, especially after the Second World War; the nuclear bombs launched in Hiroshima and Nagasaki made society conscious about the destructive capacity of science. Science journalism gained even more importance when a kind of propaganda was used by USA and URSS to compete between them for becoming a world power. They needed to convince society that their economic system was better, thus popular science articles became established as a fixed section in newspapers. At the same time, science became a popular section in Spanish newspapers during the second half of the 20th century (de Semir and Revuelta 2002: 68-81).

On the other hand, the translation of scientific texts into English is essential for spreading those advantages over the world. Ulrich Ammon points out:

Since much of the science and technology research in the 1950s and 1960s was conducted in English, most of the information in the great information storage networks was written in English. The International Federation on Documentation (FID), a world body which keeps track of information distribution, reports that nearly 85% of all the scientific and technological information in the world today is written and/or abstracted in English. (...) Scientific and technological journals in countries like Sweden and Hungary publish more material in English than they do in their national languages (Ammon 2001: 11-12).

This final degree project deals with the translation of popular science articles about Alzheimer's disease. This illness affects a huge amount of people in our society, and although there is no cure nowadays, many studies and advances are being made to find an effective treatment. This is why new articles on the topic covering different degrees of specialization are written almost every day; this fact implies a huge demand of translations.

This project consists in a Spanish-English translation of three popular science articles on the Alzheimer's disease. In order to perform an appropriate translation, we will take into account the purpose and the participants of the communicative situation reflected in these popular science articles. Besides terminology and phraseology from the source texts will be observed in order to select the entries for building up a bilingual glossary before and during the translation process. Specialized glossaries and different type of corpora will be used to find appropriate term equivalents and collocations. Moreover, a translation memory will be created with texts of similar characteristics to the source ones: then texts originally written in English will be aligned with their translations in Spanish. All these tools will be used for translating the articles.

2. Analysis of the source texts

The popular science articles which will be translated belong to the newspaper *El Mundo* and *Diario Libre*. This kind of genre is usually written by scientific journalists, who are not always experts on the topic they write, but they have enough knowledge to understand specialized texts and write articles in an easier way, having a general audience in mind. Christiane Brand states that:

The goal of popular science journalism is to communicate complex scientific information in a familiar and easily accessible way. This can be reached by reducing the amount of information and by achieving the correct balance between abstract and concrete points. (...) To reduce the density, scientific information that is left within the text is, for example, followed by supporting explanations. (Brand 2008: 36)

According to Brand (2008: 37-38), there are several techniques which can be used in order to transform a technical scientific text into a popularized scientific text, such as:

- The use of substitutional devices
- The process of reformulating or paraphrasing
- The use of definitions
- The use of an analogy or a metaphor

- The process of generalisation
- The process of exemplification and concretisation

Consequently, it can be expected to find some of these features in the source texts. The register is neutral, which means that the language is not too technical or deep, because they are addressed to lay people who are interested in acquiring knowledge on the topic. Therefore, the illness is explained by means of easy vocabulary, definitions, and explanations in order to make it understandable. They are written in an impersonal tone, and there are no colloquialisms such as exclamation marks, or slang vocabulary. Since they are addressed to non-experts, a translator should not omit the explanations and definitions included; he/she must search for English equivalents that suit the audience.

Regarding the function of these texts, their objective is to provide basic information about Alzheimer (e.g. symptoms or treatments) to educated people, patients, caregivers etc.

3. Materials and method

In order to translate the cited texts, several tools have been used: specialized glossaries and dictionaries, a self-made specialized glossary built while translating; a monolingual corpus composed by texts of similar characteristics to the ones that have been translated; and a translation memory formed by texts originally written in English and their translations in Spanish.

Official Alzheimer organizations and institutions provide glossaries about the disease in order to make it understandable for the patients and caregivers. These glossaries are useful for increasing the knowledge about the disease, and consequently the texts are easier to understand.

Medical dictionaries have been also consulted in order to search for certain terms. These dictionaries are available online.

The monolingual corpus is a tool that provides examples of authentic usage of language. This means that the terms and structures from the corpus are reliable, since they are actually used in real contexts (Ramon, 2006: 286).

In addition, the translation memory is a relevant tool for the translating process since it contains original texts in English and translated texts in Spanish. For our purpose, the translation of Spanish popular science articles into English, TM's direction has been changed. The TM has been useful for searching for equivalents.

Finally, the specialized glossary built for this project contains terms in Spanish and their equivalents in English. The importance of this glossary is that it has been enriched with collocations extracted from the monolingual corpus as well as the translation memory.

3.1 Specialized glossaries: Alzheimer disease

Two bilingual glossaries dealing with Alzheimer disease were found. Since they are bilingual, a better understanding of the meaning of the term is achieved. Moreover, they contain terms that do not appear in other glossaries, such as “cuerpo calloso/corpus callosum”. However, one of these glossaries has been built by a layman; as a consequence, its terms must be corroborated by using other tools, such as medical dictionaries and other glossaries. The other bilingual glossary belongs to the Alzheimer's Association, which is “the world's leading voluntary health organization in Alzheimer's care, support and research” (“About Us”, Alzheimer's Association). Therefore, this glossary was reliable and useful for this project. Moreover, this glossary contains hyperlinks with more information about some terms that may be difficult for a non-expert on the topic.

Several monolingual glossaries were also found on the Internet. Regarding the Spanish monolingual glossaries, the most useful one is the CEAFA glossary. CEAFA (Confederación Española de Asociaciones de Familiares de Personas con Alzheimer y otras demencias) is a non-governmental organization which tries to improve the life

quality of the patients and their caregivers. Since it is an official organization, the glossary is reliable; terms are organized alphabetically, which makes the search easier.

With regards to the English monolingual glossaries, the most useful for this project was the one provided by Cleveland Clinic. It is organized alphabetically and each term is defined correspondingly.

3.2 Medical dictionaries

The most relevant dictionaries for searching medical terms are the Medline Plus and the Medilexicon, which are available online. Both of them also allow finding the name of drugs and supplements that are used to treat diseases, as well as abbreviations, medical equipment, and synonyms.

3.3 Monolingual English corpus

For compiling this corpus, some candidate terms were selected during the analysis of the source text. Then, the ones which were directly associated with Alzheimer's disease were chosen, translated and used as key words during the search of popular science articles in American newspapers. The fact that the texts share the same characteristics, in terms of genre, register and function, as the source ones is crucial for obtaining a representative corpus. Those texts were gathered up from three different American journals: *Medical News Today*, *Scientific American* and *Science Daily*. The texts were collected in a word document obtaining a corpus size of 100,160 words; then the document was transformed in txt format for its use in AntConc. AntConc is a free concordancer software program that makes possible to find key words in context and collocations of each search term. Since the aim of this project is the inverse translation of three texts, this corpus will help to search for more natural structures and phrases in English that are not frequent in Spanish, such as the gerund (e.g. "For those *dealing* with memory loss..."; "Testing the cognitive function of..."; "After monitoring these subjects for 9 months...").

3.4 Translation memory

A translation memory, also called TM, consists of a collection of source texts in one language, (which in this case is English) and their translations in other language (which in this project is Spanish). This collection grows as more translations are done, and as a result, the translator's job is faster as he translates more texts. The texts that form this TM are collected from bilingual online sources, including Alzheimer's Association or U.S. National Library of Medicine. In addition, WeBiText and Linguee were helpful for finding texts written in English and their translations into Spanish, since both pages show concordances of a key word in both languages, accompanied by a hyperlink to the source.

WeBiText is a multilingual translation help tool that retrieves translations of words and expressions in pre-defined and/or user-specified Web sites used as bilingual corpora. The user selects the source and the target languages in the list of all the languages supported on all those sites, and then selects a site among those that support the two selected languages. <http://www.WeBiText.com/bin/WeBiText.cgi>

The screenshot shows the WeBiText web interface. At the top, there are logos for WEBITEXT and TERMINOTIX, and navigation links for English, Français, Español, and Português. Below the logos, there is a promotional banner for the Terminotix Toolbar. The main search area includes a 'Select the languages:' section with 'English' selected for the source and 'Spanish' for the target. Below this, there is a section for 'And a predefined corpus from our list:' with a dropdown menu showing 'All sites in category Health'. There is also a section for 'Add your own sites to search (optional):' with a text input field and a 'Search' button. The search term 'alzheimer' is entered in the search box. Below the search box, there is a 'Feedback' link and a 'Click here to search in TERMIMUM Plus' link. The search results are displayed in a table with two columns: 'English' and 'Spanish'. The table shows two concordances for the word 'Alzheimer'. The first concordance shows the English text: 'There are many world days observed throughout the year related to specific health issues or conditions – from Alzheimer's to zoonoses.' and the Spanish text: 'A lo largo del año hay muchos días mundiales sobre problemas de salud o afecciones concretas: de la "A" de Alzheimer a la "Z" de zoonosis.' The second concordance shows the English text: 'Alzheimer's disease is the most common cause of dementia and may contribute to 60-70% of cases.' and the Spanish text: 'La enfermedad de Alzheimer, que es la causa de demencia más común, acapara entre un 60% y un 70% de los casos.' The table also includes a '#' column with the numbers 1 and 2, and a 'web' icon with a link to 'http://www.who.int/campaigns/en/' for the first concordance.

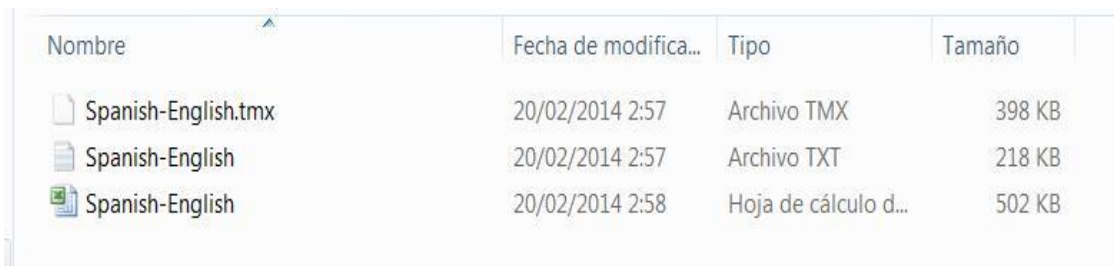
Figure 1. Bilingual concordances provided by WeBiText

This figure shows an example of the WeBiText output. First of all, source and target language must be selected. In this case, they are English and Spanish. Then, a term must be introduced, which is “Alzheimer” in this example. Then, by clicking the

“search” option, the texts in English and Spanish that contain the searched term appear. Linguee functions in a similar way.

When the concordances appear, the texts that may be interesting for the translation memory can be taken by clicking on the hyperlink that appears after the concordance. Thus, the source webpage is open, and the whole texts appear in their context.

All the texts that form the translation memory were gathered in two word documents, one for the English texts and the other for their translations in Spanish. The texts must appear in the same order when uploading them into Wordfast Anywhere. This is a free online tool that aligns the texts automatically; besides it allows altering the combination of languages. For example, the source texts that have been found on the internet were mainly written in English and translated into Spanish, however Wordfast Anywhere allows users to interchange the pair of languages. This is useful in this particular study as the texts to be translated are in Spanish. After aligning the texts from the two documents, which were previously uploaded into this tool, the translation memory is ready for downloading it. The result file contains the TM in three different formats: spreadsheet, txt, and tmx format.






Nombre	Fecha de modifica...	Tipo	Tamaño
 Spanish-English.tmx	20/02/2014 2:57	Archivo TMX	398 KB
 Spanish-English	20/02/2014 2:57	Archivo TXT	218 KB
 Spanish-English	20/02/2014 2:58	Hoja de cálculo d...	502 KB

Figure 2. Files that form the translation memory from Wordfast Anywhere

The figure 2 shows the three files provided by Wordfast Anywhere.

3.5 TM tool

Once the translation memory is ready, the following step has consisted in uploading it to a TM tool. In this case Wordfast Pro has been used. These are the steps followed for this purpose:

- a. Creation of a new project in Wordfast Pro.

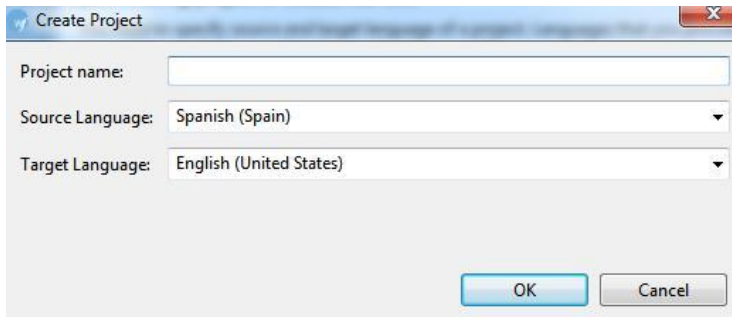


Figure 3. Creation of a Project in Wordfast Pro

As it can be seen in the figure 3, a name must be given to the project, and then the source and target languages must be chosen. Then, by clicking the “ok” bottom, the project is created.

- b. Importing a TM.

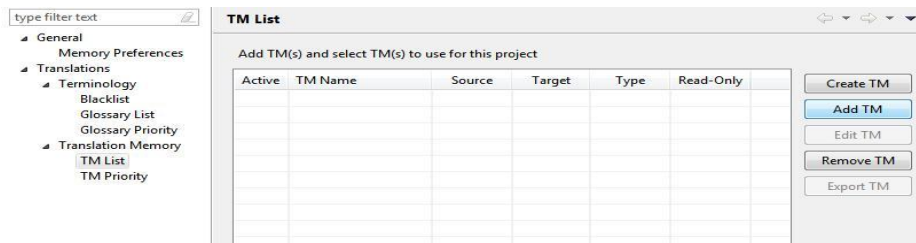


Figure 4. Uploading a TM into Wordfast Pro

In order to import the TM, the option “Add TM” must be chosen. The translator must select it from the folder in which he had previously downloaded it. The txt document is the one required.

Once the translation memory is uploaded into Wordfast Pro, and the project is created, it is ready to be used. The translator opens the text that he must translate, and the translation memory can be applied. As a result, the fragments of the text that match

identically (100%) with other fragments in the texts from the translation memory are automatically translated. There can also be fuzzy matches, which coincide in less percentage than the identical ones. Therefore, the translations provided automatically by the program should be revised by the translator. By doing this, he ensures that the translation is correct.

Moreover, this program allows selecting a term from the source text that needs to be translated and observe its equivalent(s) in the target language by means of the translation memory, if it appears. This option is called “TM lookup”, and it is really useful to find collocation of some terms and words. In the next images, an example of this option is showed.

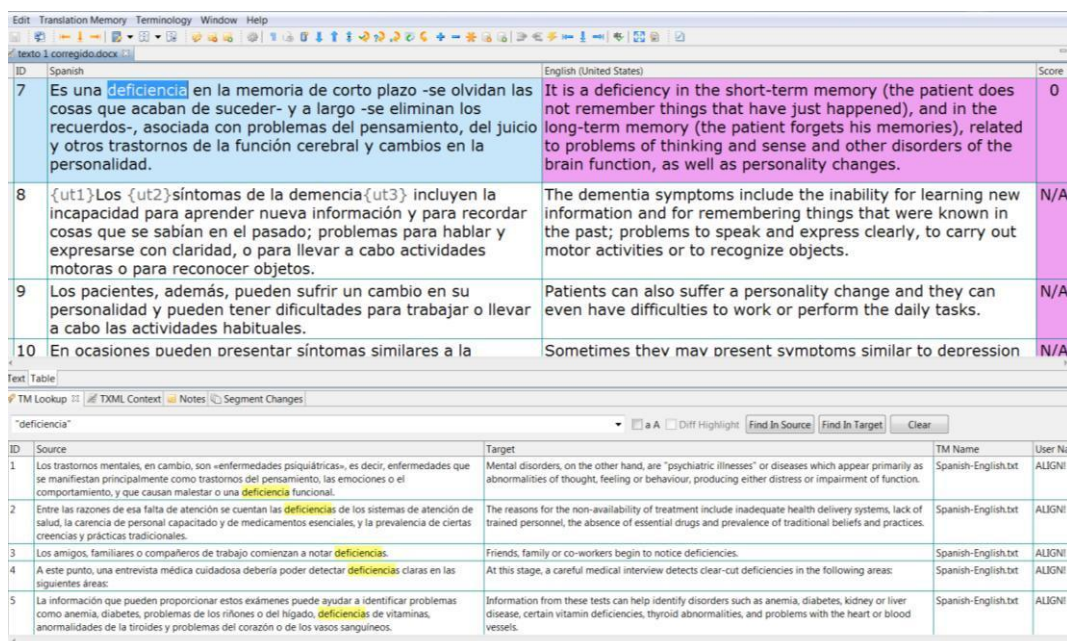


Figure 5. Example of TM Lookup option

Figure 5 shows how TM Lookup functions. At the top of the picture, the source and the target texts appear, divided in segments and distinguished by colors. The left text is the source one, and the other is the target text. The word “deficiencia” is highlighted, and the TM Lookup option shows the occurrences of this word in the texts from the translation memory. This can be observed in the lower part of the figure. This option is really helpful for searching the equivalent of a term.

A translation memory is updated continually as new texts are translated, so it is one of the most useful tools for a translator.

3.6 Self-made glossary

Terms, which are lexical units that belong to a specialized field, are a key aspect for specialized translation. Teresa Cabré points out the importance of terminology in translation.

To do their job translators depend in bilingual or multilingual vocabularies of the terms occurring in the text. This does not mean, however, that translators do not prepare terminology themselves. On occasion they have to act as terminologists to find equivalents for those terms that are not listed in the available vocabularies nor in specialized data banks (Cabré 1999: 48).

Consequently, a translator must have an active role when dealing with terminology, creating his own glossaries or terminological banks apart from using the ones built by terminologists or experts on the field.

On account of this, a specialized bilingual glossary dealing with Alzheimer's disease has been built specifically for this project. For this purpose, several candidate terms were selected from the source texts. Since they are just candidate terms, not all of them are entries of the glossary. In order to decide which terms must be part of it, two criteria were applied: topic relevance of terms and their frequency of occurrence in the texts to be translated. Thus, several Spanish glossaries on Alzheimer's disease were consulted in order to know which terms are actually associated with this disease, and to dismiss those which are too general. Once the terms were selected according to topic relevance, their frequency was analyzed by using AntConc. The "wordlist" option creates a list of all the words of the source texts, as well as the number of times they appear. Each time is called "token". Finally, after narrowing down the candidate terms according to the two mentioned criteria, the final entries were selected. The glossary has a total of 19 terms, accompanied with their English equivalents and a description. Most of the entries are nouns or complex nouns, but an important adjective has also been included. None of the entries is a verb however verbs have taken part in collocations (e.g. noun + verb).

The glossary was firstly created in a word document. For this purpose, it was drawn a table formed by two columns, one for Spanish entries and other for the English equivalents. Then, it was converted into a txt file in order to import it into Wordfast Pro. At this point the glossary could be consulted and enriched during the translation process. The essential aspect of this glossary is the fact that each terminological entry has been completed with collocations, synonyms and acronyms, which appear in the “description” part of the glossary. These collocations, synonyms and acronyms have been identified through concordances from the monolingual corpus, WebCorp and the translation memory. For instance, the equivalent for “acetilcolina” is “acetylcholine”, and it collocates with “production” or “levels”.

Concordances show all the occurrences in which a key word, called node, appears within its context, which is called span. Wendy Anderson and John Corbet (2009: 53) state that “the term collocation refers to the tendency of words to occur in the close environment of particular other words.” Thus, the knowledge of collocations in the target language is helpful to avoid the “translationese effect”. The term “translationese” refers to “any characteristics of a text that indicate that it has been translated from another language, with some loss of correctness or style in the target language” (Classe, 2000: 1421).

4. Results

This section contains the difficulties found in the process of translation, as well as an explanation of how they have been solved; the translations of the source texts; and the bilingual self-made glossary. Since the translations appear aligned with the source texts, they can be compared in order to see how they have been translated. In addition, both the source texts and their translations are divided in segments as Wordfast Pro presents them. The bilingual self-made glossary appears in three columns. The first one corresponds to the Spanish terminological entries, the second one contains their equivalents, and the third one includes collocations, synonyms and acronyms if found.

4.1 Difficulties and solutions

Main difficulties and solutions encountered while doing this project are explained in this section. Difficulties and their solutions appear in different subsections, according to the type of problem that needs to be solved. These subsections include difficulties regarding the search for the TM's texts, grammatical issues, and terminology.

4.1.1 Search for texts to feed the

When searching for texts to feed the translation memory and the monolingual corpus, several difficulties were found. The texts that form the translation memory had to be originally written in English and translated into Spanish. This is a problem because many of the texts dealing with Alzheimer are available only in one language. Therefore an exhaustive search was made. Some resources useful for finding texts are the cited WeBiText and Linguee. Since both websites show the hyperlink of the original websites from which the texts were extracted, relevant and reliable ones can be selected. In addition, Linguee and WeBiText offer the texts in English and their translation in Spanish, and the translation memory can be fed by selecting texts from them.

On the other hand, similar problems occurred when compiling the monolingual corpus, because many of the results were texts written in forums by non-experts on the topic. Therefore, an advanced search was made, and the websites that belong to official institutions and organizations, such as CEAFA or Alzheimer's Association, were selected. Other option was to use Google Scholar, in which there are only texts written by experts. The problem of using Google Scholar is that a huge amount of texts is not free. Thus, it requires time to find useful and available texts which could be taken for free.

4.1.2 Grammatical issues

Grammar differs from one language to another, and the translator should have a deep knowledge of the syntax of both languages in order to make the translations natural to the native speakers of the target language. Bearing in mind that this is an inverse translation (Spanish > English), an English monolingual corpus has been used to confirm or look for combinatory structures. The function Concord from the tool AntConc has been useful to check this information through concordances. Odalis Jones talks about the importance of knowing the target language, as well as its culture, for doing good inverse translations.

In order to do an inverse translation, and do it properly, we need to know the target language, its culture, have good translation skills to make good choices. (Jones, "Inverse Translation Is Not Always Easy.")

Therefore, collocations were searched in concordances of some terms or words. For doing this step, AntConc was the most useful tool, because it shows all the occurrences of a term in the monolingual corpus explained in the previous section. The figure 6 is an example.

sity of Cambridge in the UK, suggested that small amounts of a protein called tau - which clumps abnormally in the brains of individual markers discovered were: * Beta amyloid plaques - clusters of protein fragments that build up between nerve cells. * P-tau protein - d f protein fragments that build up between nerve cells. * P-tau protein - defected protein that can no longer stabilize microtubules. * that build up between nerve cells. * P-tau protein - defected protein that can no longer stabilize microtubules. * Tangles - twisted s longer stabilize microtubules. * Tangles - twisted strands of protein in dead and dying nerve cells. The investigators found that for) point increase in pulse pressure, the average level of P-tau protein in the spinal fluid rose by 1.5 picograms per millimeter (1 pico al disorders. For their study, the researchers investigated a protein called tau. They explain that tau is a soluble protein in the br yated a protein called tau. They explain that tau is a soluble protein in the brain that binds to microtubules - components that play a tau is supported by phosphorylation - a process that switches protein enzymes on and off and regulates their function and activity. Ho ver, the researchers say that in some diseased brains, the tau protein can become abnormally phosphorylated and cause "clumps" or "tang to around 20% of Parkinson's cases. LRRK2 'phosphorylates tau protein' Parkinson's patients can develop tangles of the tau protein as i protein' Parkinson's patients can develop tangles of the tau protein as a result of a mutated enzyme called LRRK2, the researchers sa discovered that standard LRRK2 adds groups of phosphate to tau protein, while mutated LRRK2 adds significantly more phosphates to tau p while mutated LRRK2 adds significantly more phosphates to tau protein. Using these findings, the research team were able to uncover tw s, the research team were able to uncover two sites on the tau protein - T149 and T153 - where the mutated LRRK2 was able to add phosph discovered that the two sites previously identified on the tau protein that were targeted by LRRK2, were altered the same way in human of neural activity. Alzheimer's: resveratrol targets certain protein interactions Tuesday 22 October 2013 - 8am PST New research f he disease. Scientists have identified a cholesterol-carrying protein, called ApoE4, as being a major genetic risk factor for Alzheim ing a major genetic risk factor for Alzheimer's disease. This protein is present in 25% of the American population, and about 66% of A er to finding the link between ApoE4 and SirT1 - an anti-aging protein. And they have shown that this link is targeted by resveratrol, that the reduction of SirT1 changes the way amyloid precursor protein is processed. More beta-amyloid is formed when ApoE4 levels are he box." Approximately 66% of Alzheimer's sufferers have the protein ApoE4. Research continues to explore the links between the two. n in the spaces between the brain's nerve cells when pieces of protein called beta-amyloid clump together. This process is more common 113 - 3am PST When US scientists gave non-exercising mice a protein produced by exercising mice, they found it switched on genes tha r study, Dr. Spiegelman's team had already discovered that the protein, called FNDC3, is released into the bloodstream as a variant cal) on genes that increased the expression of a brain-protective protein, EDNF, in the hippocampus, a part of the brain involved in learn ain involved in learning and memory. Researchers found that a protein produced during exercise switches on genes that preserve brain h trisin, they will first have to make a more stable form of the protein, says Dr. Spiegelman. Funds from the JPB Foundation and National required for vesicle traffic in cells. James Rothman unravelled protein machinery that allows vesicles to fuse with their targets and so

Figure 6. AntConc concordances for the term "protein"

However, there are terms that did not appear in the monolingual corpus. When this happened, they were searched in other tools, such as WebCorp, which functions as a monolingual corpus. The main difference with the monolingual corpus made for this

project is that WebCorp shows concordances from all kind of sources, whereas this corpus has been built following strict rules, such as the genre, the topic, and the register.

WebCorp is an online tool that uses internet as a corpus. This means that it provides concordances from all the texts that have occurrences of the term introduced by the translator. Thus, it can be used as a monolingual corpus. Moreover, full texts can be observed, because it gives the hyperlink to their source.

Secondly, some syntactic structures required a change to achieve a natural rhythm in the target language, as it can be seen in this example: “**Para muchos la causa de la enfermedad es genética.**” was translated as “**many authors think that this disease has a genetic cause.**” In this example, the sentence was transformed into a subordinate clause, in which “genetic” becomes the premodifier of “cause”. These changes in the syntactic structure of the sentence are made in order to create a sense of naturalness in the target language, as well as to avoid the previously mentioned “translationese effect”. The readers of the target texts should not notice that it is a translation.

An important aspect that required attention was passive structures, which are more frequent in English than in Spanish. This means that the voice of some sentences had to be changed from active to passive:

E.g. “(...) todavía **se desconoce** la causa exacta (...)” was translated into “(...) the exact cause **is not known** yet (...)”

E.g. “Este tipo de demencia **se produce por** (...)” was translated into “This kind of dementia **is produced by** (...)”

Other difference between English and Spanish grammar is the use of the gerund. It is frequently used in English, while the infinitive is more used in Spanish. This was applied in the translations of this project, such as in the next example:

E.g. “(...)para aprender y memorizar.” ¹ → ¹“(...) for learning and memorizing”.

¹ → : This symbol represents the translation into English.

4.1.3 Semantic and terminological issues

Regarding the problems found when translating these texts, the main one has been to find the appropriate equivalent for some terms of the medical field.

Although the texts belong to popular science genre and they do not contain highly technical terms, they have some, which make reference to illnesses, treatments, drugs and anatomy, such as “glándula tiroidea”, “acetilcolina”, or “neurotransmisor”.

Therefore, the correct equivalents for them in the target language were searched in dictionaries, glossaries and the translation memory. When an equivalent was found, its use was corroborated in the monolingual corpus, WebCorp, Linguee and WeBiText.

Another problem regarding the terminology of these texts is that there are several complex noun phrases, which are difficult to translate.

- E.g. “infartos cerebrales multiples” → “cerebral multi-infarcts”
E.g. “la demencia por cuerpos de Lewy” → “Lewy body dementia”
E.g. “atrofia cerebral progresiva” → “progressive brain atrophy”

In the first text, the terms or expressions that could be considered as translation difficulties are:

- “Trastorno cerebral” → “brain disorder”. For finding this equivalent, different resources were consulted, such as the monolingual corpus created for this project, WebCorp, WeBiText and Linguee. It was in WebCorp where the most concordances for this equivalent appeared.
- “Rara” → “rare”. Several concordances of this word were found in the monolingual corpus. The next figure shows some of the concordances. The word appears in the middle, highlighted in blue color and surrounded by its context in different texts.

type." Written by Christine Kearney Alzheimer's Linked To Rare Gene Mutation That Affects Immune System Thursday 15 November 2012 - 2am PST Two inter this week point to a link between Alzheimer's disease and a rare gene mutation that affects the immune system's inflammation response. The discovery sup to communicate with each other. Both teams conclude that a rare mutation in a gene called TREM2, which helps trigger immune system responses, raises th CD, adds: "While the genetic mutation we found is extremely rare, its effect on the immune system is a strong indicator that this system may be a key pl they carried out further sequencing that identified a set of rare mutations that occurred more often in 1,092 Alzheimer's disease patients than in a grou the Mayo Clinic in Florida, says: "The TREM2 variant may be rare, but it is potent." "In our series, it was present in 1.9 percent of the Alzheimer's p decades before the onset of symptoms, among patients with a rare, inherited form of the disease. The researchers from Banner Alzheimer's Institute in A tive treatments. This inherited form of the disease is very rare. However, patients have provided researchers with a unique opportunity to seek out earl s why people develop Alzheimer's disease, expect in the very rare cases of an inherited genetic mutation. One study suggested that Alzheimer's might be t ll in the body, at every stage of development. This is quite rare. In general, most types of proteins are produced in specific cells, at specific times, searcher. "While individually these diseases are relatively rare, inherited metabolic diseases are sufficiently common that they are part of newborn scr size and kill only tumor cells but not healthy cells are very rare, and the problem is how to generate large numbers of such cells. Previous work has show

Figure 7. Concordances in which the word “rare” appears

- “Memoria a corto plazo” → “short-term memory”. This equivalent was searched in the monolingual corpus, Linguee and WebCorp. But it was in the last where the biggest amount of occurrences appeared.

1) <http://www.simplypsychology.org/short-term-memory.html>

Text, Wordlist, text/html, UTF8 (HTML source), 2014-05-05 (Server header)

1: adults can store between 5 and 9 items in their short-term memory. This idea was put forward by Miller (1956) and
 2: (1974) have developed an alternative model of short-term memory which they call working memory. References
 3: Shiffrin, R. M. (1971). The control processes of short-term memory. Institute for Mathematical Studies in the

2) <http://science.howstuffworks.com/life/inside-the-mind/human-brain/human-memory2.htm>

Text, Wordlist, text/html, UTF8 (Content-type), 2014-06-01 (Server header)

4: memories: first in the sensory stage; then in short-term memory; and ultimately, for some memories, in long-term
 5: that first flicker, the sensation is stored in short-term memory. Short-term memory has a fairly limited
 6: the sensation is stored in short-term memory. Short-term memory has a fairly limited capacity; it can hold about
 7: such as 8005840392 may be too much for your short-term memory to hold. But divided into chunks, as in a
 8: number, 800-584-0392 may actually stay in your short-term memory long enough for you to dial the telephone.
 9: number to yourself, you can keep resetting the short-term memory clock. Important information is gradually
 10: information is gradually transferred from short-term memory into long-term memory. The more the information
 11: to perform better on tests.) Unlike sensory and short-term memory, which are limited and decay rapidly, long-term
 12: information must first pass through sensory and short-term memory before it can be stored as a long-term memory.

3) http://www.human-memory.net/types_short.html

Text, Wordlist, text/html, Cp1252 (CharDET), 2013-03-23 (Server header)

13: more likely to lead a happy and successful life. Short-term memory acts as a kind of "scratch-pad" for temporary
 14: rest is read, a task which is carried out by the short-term memory. Other common examples of short-term memory in
 15: the short-term memory. Other common examples of short-term memory in action are the holding on to a piece of
 16: it into another). What is actually held in short-term memory, though, is not complete concepts, but rather
 17: we make a conscious effort to retain it, and short-term memory is a necessary step toward the next stage of
 18: of which...

Figure 8. Short-term memory concordances from WebCorp

- “Memoria a largo plazo” → “long-term memory”. As in the previous example, this term was consulted in different resources. This equivalent had occurrences in the monolingual corpus, as well as in WebCorp.
- “Pérdida de memoria” → “memory loss”. This equivalent was found in the monolingual corpus, since it is related to the Alzheimer’s disease. In the following figure, some concordances can be observed.

and of course tightly related to taste sensation. For those dealing with memory loss, or the chance of it, or for those dealing with recovery of mental n to certainly continue cholesterol treatment in people who are developing memory loss regardless of concerns regarding their cardiovascular health." "It el, based on the reading of cognitive test scores, could determine whether memory loss in older adults is benign or whether it could develop into Alzheimer the UK conducted a study revealing that the drug, liraglutide, may reverse memory loss in the late stages of Alzheimer's, as well as prevent the build-up analysis, or reliable interview techniques." Major cause of age-related memory loss discovered Friday 30 August 2013 - 8am EST Scientists say they red a protein deficiency in the brain that is a major cause of age-related memory loss, according to a study published online in the journal Science Trans say this discovery offers the "strongest causal evidence" that age-related memory loss and Alzheimer's disease are individual recognizable conditions. Th memory, lacks a protein called RbAp48 in those who experience age-related memory loss. The finding suggests that a deficiency of this protein is a cause loss. The finding suggests that a deficiency of this protein is a cause of memory loss, but more importantly, the researchers say this form of memory loa use of memory loss, but more importantly, the researchers say this form of memory loss is reversible. They began conducting this current study in order t at Alzheimer's disease is a completely separate condition from age-related memory loss. Previous research has suggested that Alzheimer's disease hinders ppcampus. According to the study authors, it was thought that age-related memory loss was an early sign of Alzheimer's, but they add that recent evidenc ign of Alzheimer's, but they add that recent evidence suggests age-related memory loss is a separate process that affects the dentate gyrus (DG). This is Researchers have discovered that the RbAp48 gene is a cause of age-related memory loss, setting it apart from Alzheimer's disease. RbAp48 gene discovered n the brains of healthy young mice. The mice demonstrated the same form of memory loss when tested by object recognition and water maze memory tests. How Institute, says: "Our study provides compelling evidence that age-related memory loss is a syndrome in its own right, apart from Alzheimer's. In addit ory disorders, these results have public health consequences." Age-related memory loss 'reversible' The researchers executed another experiment, using vi mice. Dr. Kandel says the fact they have been able to reverse age-related memory loss in the mice is very encouraging. "Of course, it's possible that othe, it's possible that other changes in the DG contribute to this form of memory loss," he adds. "But at the very least, it shows that this protein is a this protein is a major factor, and it speaks to the fact that age-related memory loss is due to a functional change in neurons of some sort. Unlike with

Figure 9. "Memory loss" concordances from the monolingual corpus

- "Traumatismos cerebrales leves" → "mild brain injuries". This term was not easy to find, but it appeared in Linguee. Then, I corroborated it in WebCorp, and it appeared several instances in similar contexts. Moreover, the concordances belong to different sources, so it is a reliable equivalent.

2) <http://www.dynamicchiropractic.com/mpacms/dc/article.php?id=41121>
Text, Wordlist, text/html, UTF8 (HTML source), 1994-03-11 (Meta tag)

6: single most important agent in both fatal and mild brain injuries. From 40 percent2 to 60 percent3 of all mild
7: injuries. From 40 percent2 to 60 percent3 of all mild brain injuries are caused by motor vehicle accidents (MVA's)

3) <http://www.washington.edu/news/2014/05/06/social-workers-can-help-patients-recover-from-mild-traumatic-brain-injuries/>
Text, Wordlist, text/html, UTF8 (Content-type), 2014-01-01 (Copyright footer)

8: traumatic brain injury is usually obvious, mild brain injuries are often harder to detect, and can cause

4) <http://www.traumaticbraininjury.net/faqs/>
Text, Wordlist, text/html, UTF8 (Content-type), 2013-01-01 (Copyright footer)

9: makes diagnosis significantly more difficult. Mild brain injuries, or concussions, may include dizziness, sleep

5) <http://www.urmc.rochester.edu/news/story/index.cfm?id=4072>
Text, Wordlist, text/html, UTF8 (Content-type), 2012-08-08 (Body near 'Last Modified')

10: study the fundamental neurological impact of mild brain injuries has lagged." There has been a great deal of

Figure 10. Mild brain injuries concordances from WebCorp

In the second text there are also several examples of terms that are translation difficulties, and the same resources as in the previous case were used.

- "Depósitos insolubles extracelulares" → "extracellular deposits of amyloid." This equivalent was selected after searching in the monolingual corpus and WebCorp.
- "Placas seniles" → "senile plaques." As in the previous example, this equivalent appeared in a huge amount of concordances from the monolingual corpus and WebCorp.

- “Placas neuríticas” → “neuritic plaques.” This term appeared in the translation memory. It was also corroborated in WebCorp.
- “Neurofibrillas” → “neurofibrillary tangles.” This equivalent was found in many different sources, such as the monolingual corpus, WebCorp, Linguee, and even in the medical dictionary called Medline Plus. It is an example of a single-word term which has a two-word equivalent in English.

In the last text, similar problems related to terminology were found.

- “Provenientes de la adiposa” → “Tissue-derived.” This is a modifier of a term, but it changes its structure in English. Several sources were necessary to find this equivalent, such as WebCorp.
- “Barrera hematoencefálica” → “Blood-brain barrier.” This term was not difficult to find because there were many instances of it in Linguee, WebCorp, and the English monolingual corpus.

4.1.4 Other problems

Another difficulty was to translate a quotation. It was direct style, so I doubted whether translating it literally or paraphrasing it, in order to create an indirect style quotation. The original speech of Professor Yoo-Hun Suh and Dr. Jeong Chan-Ra was searched in the web, but they were not available, so I finally decided to paraphrase the quotations.

Apart from that, another difficulty appeared in the third text. The source text was not correctly written in the source language, so its comprehension was difficult. Since there is no possibility of addressing the writer of the text to discuss the meaning, it is the translator who must guess the meaning, and try to transmit it in the target language as clearly as possible (vid infra, last segment of Text 3)

4.2 Translation of Text 1. (“Una forma de demencia”, *El Mundo*)

Source (ES)	Target (EN-US)
Una forma de demencia	A type of dementia
La Enfermedad de Alzheimer , la causa más frecuente de demencia en los ancianos, es un trastorno grave, degenerativo, producido por la pérdida gradual de neuronas cerebrales, cuya causa no es del todo conocida.	The Alzheimer’s disease, the most frequent dementia in old population, is a severe, degenerative disorder produced by the gradual loss of neurons; its cause is not completely known yet.
Se trata de una enfermedad muy rara en los pacientes jóvenes, ocasional en los de mediana edad y más frecuente a medida que se cumplen años.	This disease is rare in young patients, it is occasional on middle-aged ones and more frequent as people age.
La enfermedad afecta a las partes del cerebro que controlan el pensamiento, la memoria y el lenguaje.	It affects the parts of the brain that control thought, memory and language.
Aunque cada día se sabe más sobre la enfermedad, todavía se desconoce la causa exacta de la misma y hoy por hoy no se dispone de un tratamiento eficaz .	Although the bounds of our knowledge about the disease are being extended constantly, the exact cause is not known yet, and there is no an effective treatment nowadays.
La demencia es un trastorno cerebral que afecta seriamente a la habilidad de una persona para llevar a cabo sus actividades diarias.	Dementia is a brain disorder that seriously affects the person's ability to carry out his daily activities.
Es una deficiencia en la memoria de corto plazo -se olvidan las cosas que acaban de suceder- y a largo -se eliminan los recuerdos-, asociada con problemas del pensamiento, del juicio y otros trastornos de la función cerebral y cambios en la personalidad.	It is a deficiency in the short-term memory (the patient does not remember things that have just happened), and in the long-term memory (the patient forgets his memories), related to problems of thinking and sense and other disorders of the brain function, as well as personality changes.
Los síntomas de la demencia incluyen la incapacidad para aprender nueva	The dementia symptoms include the inability for learning new information

información y para recordar cosas que se sabían en el pasado; problemas para hablar y expresarse con claridad, o para llevar a cabo actividades motoras o para reconocer objetos.	and for remembering things that were known in the past; problems to speak and express clearly, to carry out motor activities or to recognize objects.
Los pacientes, además, pueden sufrir un cambio en su personalidad y pueden tener dificultades para trabajar o llevar a cabo las actividades habituales.	Patients can also suffer a personality change and they can even have difficulties to work or perform the daily tasks.
En ocasiones pueden presentar síntomas similares a la depresión (como tristeza o problemas de adaptación) o a la ansiedad.	Sometimes they may present symptoms similar to depression (like sadness or adaptation problems) or anxiety.
Entre un 25% y un 50% de las personas con más de 65 años tiene problemas subjetivos de pérdida de memoria, sin embargo esto no tiene por qué significar que vayan a desarrollar una demencia en el futuro y los expertos suelen considerar esta disminución de las capacidades algo normal que se asocia con la edad.	Between 25% and 50% people older than 65 years have subjective memory loss problems, however this may not mean that they will develop dementia in the future; experts usually consider the decrease on abilities as something normal associated to age.
Existen causas reversibles de demencia como la fiebre alta, la deshidratación, los déficits vitamínicos, la mala nutrición, reacciones adversas a fármacos, problemas con la glándula tiroidea o traumatismos cerebrales leves.	There are reversible dementia causes such as high fever, dehydration, vitamin deficiency, poor nutrition, adverse reaction to drugs, thyroid hormone problems or mild brain injuries.
El reconocimiento de estas causas y su tratamiento puede mejorar la situación del enfermo, pudiendo retornar a su situación previa tras curar el proceso que ha provocado las alteraciones.	The recognition of these causes and their treatment can improve patient's situation, reversing the previous situation after curing the process that has provoked the alterations.
Sin embargo, en la mayoría de los casos la demencia no es reversible.	However, in most cases the dementia is not reversible.
Las causas más frecuentes de demencia irreversible son el mal de Alzheimer y	The most common causes of irreversible dementia are: Alzheimer's disease and

<p>otras enfermedades como la enfermedad de Parkinson o la demencia por cuerpos de Lewy, que forman el grupo de demencias degenerativas .</p>	<p>other diseases like Parkinson's disease or Lewy body dementia, which include the degenerative dementia group.</p>
<p>Las demencias de causavascular son las segundas en importancia en los países occidentales, y las primeras en algunos países orientales como Japón.</p>	<p>The vascular dementias are the second largest type of dementia in Western countries, and the first in some Eastern countries like Japan.</p>
<p>Este tipo de demencia se produce por lesiones en los vasos que irrigan el cerebro, bien por infartos cerebrales múltiples , o por hemorragias , o por disminución de la sangre que llega al cerebro.</p>	<p>This kind of dementia is produced by injuries in the vessels which supply the brain with blood, either by cerebral multi-infarcts, by bleedings or by decreased blood flow to the brain.</p>
<p>Con frecuencia los pacientes tienen una demencia 'mixta', es decir que tienen una enfermedad degenerativa y una afectación cerebrovascular.</p>	<p>Patients frequently have a mixed dementia, which means that they suffer from a degenerative disease and a cerebrovascular disease.</p>
<p>La demencia se está convirtiendo en uno de los problemas sanitarios más importantes de nuestra sociedad, cada vez más anciana .</p>	<p>Dementia is becoming one of the most important health problems of our society, which is getting older.</p>
<p>La frecuencia de la demencia se duplica cada cinco años, a partir de los 65 años, y se estima que más del 30% de los pacientes mayores de 85 años tienen demencia.</p>	<p>The frequency of dementia is doubled every five years in patients over 65, and it is estimated that more than 30% of the patients over 85 suffer from dementia.</p>
<p>Muchos de estos pacientes tienen una demencia tipo Alzheimer.</p>	<p>Many of these patients have a dementia similar to Alzheimer's disease.</p>
<p>Históricamente el término enfermedad de Alzheimer se aplicó a la demencia progresiva que se desarrollaba en la edad media de la vida, antes de la etapa senil .</p>	<p>Historically, the term Alzheimer's disease was applied to the progressive dementia that was developed in the mid-life, before the senile stage.</p>
<p>Por el contrario, se denominaba demencia senil a la que aparecía en las</p>	<p>On the contrary, the term senile dementia was applied to the one that</p>

etapas avanzadas de la vida.	appeared in the later stages of life.
Con el tiempo se fue demostrando que ambos procesos eran el mismo, independientemente de la edad de aparición.	As time passed, it was demonstrated that both processes were the same, regardless the age of onset.

4.3 Translation of text 2 (“Su rastro en el cerebro”, *El Mundo*)

Source (ES)	Target (EN-US)
La enfermedad produce una atrofia cerebral progresiva que afecta a todas las partes del cerebro.	The disease provokes a progressive brain atrophy which affects all parts of the brain.
Cuando se hacen estudios en pacientes que han fallecido y tenían el diagnóstico de mal de Alzheimer se ve que el cerebro está disminuido de peso y de volumen.	Studies on dead patients who had been diagnosed with Alzheimer's disease have demonstrated that the brain presents decreased weight and volume.
Las neuronas se van destruyendo por la aparición de depósitos insolubles extracelulares (alrededor de las neuronas), cuyo elemento fundamental es una proteína llamada beta-amiloide (placas seniles y placas neuríticas) y depósitos intracelulares (dentro de las propias neuronas).	The neurons are destroyed by the development of extracellular deposits (around the neurons), whose central element is a protein called beta-amyloid (senile plaques and neuritic plaques) and intracellular deposits (inside the neurons.)
Estos depósitos dan lugar a una degeneración neurofibrilar, cuyo principal componente es una proteína denominada tau.	These deposits give rise to a neurofibrillary degeneration, which main component is the tau protein.
La presencia de acúmulos de proteínas (neurofibrillas) en las neuronas es el hallazgo anatomopatológico característico de esta enfermedad y se considera un marcador de la misma.	The presence of proteins (neurofibrillary tangles) accumulated in the neurons is the anatomopathological finding that characterizes this disease; it is considered an indicator of the

	presence of Alzheimer.
Sin embargo, se desconoce el papel exacto que tienen estas estructuras a la hora del desarrollo de la enfermedad, cuál es la causa de su aparición y por qué algunos pacientes ancianos tienen neurofibrillas y no desarrollan síntomas mientras otros pacientes si que desarrollan la enfermedad.	However, there are still unclear facts such as the exact role played by those proteins in the development of the disease, the cause of the illness and the reason why some old patients who have neurofibrillary tangles do not present symptoms while other patients develop the disease.
Desde el punto de vista bioquímico, la enfermedad de Alzheimer se asocia a una disminución de los niveles cerebrales de acetilcolina (una sustancia química que existe en el cerebro y que trabaja enviando señales de una neurona a otra, este neurotransmisor es fundamental para aprender y memorizar).	From a biochemical point of view, Alzheimer's disease is related to a decrease of the acetylcholine brain levels (a chemical substance which is present in the brain and sends neural signals. This neurotransmitter is essential for learning and memorizing).
La falta de esta sustancia reduce los estímulos que tienen que pasar de una célula a otra, base del funcionamiento de los circuitos neuronales que nos permiten fijar recuerdos, aprender nuevas cosas y evocarlas, así como llevar a cabo otras actividades intelectuales.	The lack of this substance reduces the transfer of stimuli from one cell to another. This is the base of the neural circuit functioning that allow us to fix memories, learn new things and remember them, as well as carry on intellectual tasks.
Pero ¿qué desencadena la enfermedad? Existen muchas teorías que pretenden explicar la aparición del Alzheimer.	But, what is the cause of the disease's development? There are many theories that try to explain this development.
Algunos autores creen que podría haber causas tóxicas que hagan que las neuronas se vayan degenerando y se acumulen proteínas en el cerebro.	Some authors believe that there could be toxic causes which provoke the neural degeneration and the accumulation of proteins in the brain.
Otros piensan que puede ser una infección la que produce las alteraciones neurofibrilares y la muerte neuronal.	Others believe an infection may cause the neurofibrillary alterations and the neuronal death.
Por último, para muchos autores la causa de la enfermedad es genética, bien por	Lastly, many authors think that this disease has a genetic cause, rather by

herencia familiar o bien por mutaciones que aparecen en individuos sin antecedentes de esta enfermedad.	family history or by mutations that appear in individuals without history of Alzheimer.
Los traumatismos , las reacciones autoinmunes (el organismo no reconoce células propias y las ataca) también han sido consideradas como posibles desencadenantes .	Injuries, autoimmune reactions (the organism does not recognize its own cells and attacks them) are also considered as possible triggers.
Ninguna de las teorías excluye por completo a las otras, y ninguna se considera todavía como definitiva.	None of the theories exclude completely the others, and any of them is recognized as the definitive one.

4.4 Translation of text 3 (“Células Madre Para Ayudar a Curar Alzheimer”, *Diariolibre.com*)

Source (ES)	Target (EN-US)
Células madre para ayudar a curar Alzheimer	Stem cells to cure Alzheimer
SEÚL, Corea del Sur.	SEUL, South Korea.
En el primer estudio de su clase, esta semana investigadores de la principal universidad de Corea y el RNL Bio Stem Cell Technology Institute anunciaron los resultados de un estudio que sugiere una posibilidad sorprendente: las células madre adultas no solo tienen un efecto positivo en las personas que padecen la enfermedad de Alzheimer, sino que también pueden prevenir la enfermedad.	Some researchers from the main university of Korea and the RNL Bio Stem Cell Technology Institute announced the result of a study that suggests an amazing possibility: apart from having a positive effect in patients suffering from Alzheimer, adult stem cells can also prevent this disease.
Usando células madre adultas derivadas de la grasa humana (término científico: adMSCs, o células madre mesenchymal humanas provenientes de la adiposa), los investigadores lograron la regeneración	Researchers achieved to regenerate the brains of the animal models which suffered from Alzheimer's disease by using adult stem cells derived from human fat. The scientific term of these

en los cerebros de los modelos animales con la enfermedad Alzheimer.	stem cells is adMSC, or adipose tissue-derived mesenchymal stem cell.
Por primera vez en la historia, los investigadores utilizaron las células madre para identificar el mecanismo clave para tratar la enfermedad de Alzheimer, y demostraron cómo lograr eficacia así como prevenir los síntomas del Alzheimer con las células madre adultas, un "santo grial" de los científicos biomédicos durante décadas.	For the first time, researchers have used stem cells in order to identify the key mechanism that can treat the Alzheimer's disease. They also have also demonstrated how to prevent effectively the Alzheimer's symptoms by using adult stem cells. They have been the holy grail of biomedical scientists for decades.
La enfermedad de Alzheimer, la forma más común de la demencia (la pérdida de la función cerebral), es la sexta causa principal de la muerte, y afecta a 1 de cada 8 personas - más que el cáncer del seno.	The Alzheimer's disease, which is the most common form of dementia (loss of brain function), is the sixth main cause of death. It affects one out of eight people - more than breast cancer.
Hasta 2010, 35,6 millones de personas en el mundo tenían la enfermedad de Alzheimer, pero está previsto que aumente esta cifra el doble cada 20 años.	Up until 2010, 35.6 millions of people suffered from Alzheimer's disease in the world. This figure is predicted to double each 20 years.
Se calcula que el coste total del Alzheimer es de US\$604 mil millones en todo el mundo, de los cuales un 70% corresponde a los Estados Unidos y Europa.	It is estimated that Alzheimer's disease has a total cost of US\$604 thousand millions in the whole world. 70% of them correspond to the United States and Europe.
Para hacernos una idea, el cuidado para las personas con Alzheimer cuesta más que los ingresos de Wal-Mart (US\$414 mil millones) y Exxon Mobil (US\$311 mil millones), según el Informe Mundial Británico sobre el Alzheimer de ADI.	To get a rough idea, according to the World Alzheimer Report by ADI, the care for Alzheimer's patients costs more than the Wal-Mart income (US\$14 thousand millions) and Exxon Mobil (US\$311 thousand millions).
El costo del Alzheimer ocupa el primer puesto en la lista de los economistas de salud de desórdenes del envejecimiento que podrían hacer naufragar economías nacionales enteras, y que a menudo	The cost of Alzheimer is placed at the top of the list from the health economists regarding disorders of aging. These costs could wreck whole national economies and ruin patients'

arruinan no solo las vidas de los pacientes sino de sus familiares también.	life, as well as their families.
Según los resultados de este primer estudio importante, el Alzheimer pronto puede convertirse en una enfermedad prevenible, o aun cosa del pasado.	According to the results of this first significant study, Alzheimer's disease can become a predictable disease, or even be cured.
De igual importancia, la administración humana segura de la clase de células madre adultas utilizadas en este experimento ha sido establecida en varios artículos y ensayos clínicos aprobados por el gobierno.	It is equally important that the safe human administration of adult stem cells used in this experiment has been established in several articles and clinical trials approved by the government.
La investigación	The research
El estudio fue co-liderado por Yoo-Hun Suh, profesor de la Universidad Nacional de Seúl, y el Dr. Jeong-Chan Ra, director del RNL Bio Stem Cell Technology Institute (SCTI).	The study was co-led by Yoo-Hun Suh, teacher of Seoul National University, and Dr. Jeong-Chan Ra, director of RNL Bio Stem Cell Technology Institute (SCTI).
Los investigadores y sus equipos inyectaron células madre en ratones genéticamente diseñados para exhibir los síntomas principales y fisiología de la enfermedad de Alzheimer.	Researchers and their teams injected stem cells into mice. They were genetically designed to show the main symptoms and the physiology of Alzheimer's disease.
El costo de la enfermedad ocupa uno de los primeros lugares en la lista de los economistas de salud	The cost of this disease is taking up one of the first places in the list of health economists.
Lograron determinar que estas células madre humanas, provenientes del tejido adiposo, se comportan de manera muy especial cuando se inyectan en la vena de la cola de los ratones sujetos de la investigación.	They showed that these adult stem cells derived from the adipose tissue behave in a special way when they are injected in the vein of the mice's tails from the research.
Las células migraron por la barrera hematoencefálica, considerada por muchos imposible de cruzar por las células madre adultas, y entraron en el	The cells migrated through the blood-brain barrier, which many people think cannot be crossed by adult stem cells,

cerebro.	and entered the brain.
De hecho, las células con etiqueta floreciente fueron observadas para la distribución en los sujetos y el equipo encontró que las células infundidas migraron por los cuerpos incluyendo el cerebro, con excepción del órgano olfatorio, y, por consiguiente pudieron confirmar que las células infundidas por vía intravenosa pueden alcanzar el cerebro cruzando la barrera hematoencefálica.	In fact, the distribution of the cells in subjects' body was observed, and the team found that the injected cells went through the whole body, including the brain, except the olfactory organ. Therefore they could confirm that cells injected intravenously can enter the brain, crossing the blood-brain barrier.
Varias veces durante un periodo de tres a 10 meses, con intervalos de dos semanas, el equipo introdujo por vía intravenosa las células madre adiposas en los ratones modelos del Alzheimer.	Several times during a period from three to ten months, at intervals of two weeks, the team injected intravenously the adipose-tissue derived stem cells in the model mice with Alzheimer.
Los ratones que recibieron las células mostraron significativas mejoras en todos los sentidos: la capacidad de aprender, la capacidad de recordar, y los señales neuropatológicos.	The mice which received the cells showed a significant improvement in all respects: learning capacity, remembering capacity, and neuropathological signs.
Por primera vez, y aun mas importante, los ratones modelos del Alzheimer mostraron la medición de IL-10, conocido por su protección antiinflamatoria y neurológica.	For the first time, and even more important, Alzheimer model mice showed IL-10 measurement, which is known by its anti-inflammatory and neurological protection.
El equipo también encontró que las células madre restauraron la especial capacidad de aprender entre los sujetos modelos del Alzheimer con una reducción significativa de las lesiones neuropatías.	The team also found that stem cells restored the special learning capacity of the Alzheimer model subjects, with a significant reduction of the neuropathies.
Esto se verificó con el empleo de exámenes utilizados en la enfermedad de Alzheimer: las evaluaciones de comportamiento.	This was verified by using tests used in the Alzheimer's disease: behavior assessments.

Durante las evaluaciones, se encontró, de manera sorprendente, que el efecto terapéutico de las células madre en la enfermedad de Alzheimer era tremendo.	During these assessments, it was found surprisingly that the therapeutic effect of the stem cells in the Alzheimer's disease was enormous.
Esto fue notado asimismo en el análisis patológico.	This effect was also notable in the pathological analysis.
La clave, sin embargo, fue la prevención: los científicos mostraron que las células madre, cuando se infunden en los ratones con Alzheimer, redujeron la beta amiloide y APP-CT, que se sabe que causa la destrucción de las células cerebrales, dando lugar a la demencia y la enfermedad de Alzheimer.	However, the prevention is the key aspect: scientists showed that stem cells reduced the beta amyloid and APP-CT when they are injected into the mice suffering from Alzheimer. Beta amyloid and APP-CT cause the destruction of the brain cells, giving rise to dementia and Alzheimer's disease.
En el laboratorio, se veía que las células madre aumentaron la neprelisina, que hidroliza las proteínas tóxicas.	In the laboratory, it could be observed that stem cells increased the neprilysin, which hydrolyzed the toxic proteins.
Ningún otro compuesto o tratamiento ha sugerido tan enfáticamente el potencial de prevenir, así como detener, esta epidemia de la demencia incurable que hace sufrir a los pacientes y sus familias	There is no any other compound or treatment that has such a great potential of preventing, as well as stopping, this epidemic of incurable dementia which provokes the suffering of patients and their families.
Detener la enfermedad de Alzheimer, y mucho menos, prevenirla, es el enfoque de miles de investigadores en todo el mundo.	Stopping Alzheimer's disease and preventing it is the focus of thousands of researchers in the whole world.
Comentando su descubrimiento pionero, el Profesor Yoo-Hun Suh, quien lideró el estudio, dijo, "Es un descubrimiento revolucionario el hecho de que un método tan sencillo como la inyección intravenosa de las más seguras células madre adiposas autólogas, sin causar ningún rechazo inmune, ni problema ético, haya abierto una nueva puerta para	Professor Yoo-Hun Suh, who led the study, said that "such a simple method as the intravenous injection of safer adipose autologous stem cells is a revolutionary discovery and it does not seem to provoke any immune rejection or ethical problem, opening doors towards the cure of Alzheimer's disease, one of the most horrible,

conquistar la enfermedad de Alzheimer, una de las enfermedades más horribles, caras e incurables de nuestros tiempos."	expensive and incurable diseases of our time.
El líder del RNL Bio Stem Cell Research Institute, el Dr. Jeong-Chan Ra, también dijo, "Está más claro que nunca que es un imperativo ético que los gobiernos ofrezcan a los pacientes con enfermedades incurables el derecho de participar no solo en estudios como este sino también en terapias con potencial obvio, una vez que hayan sido ensayados en cuanto a seguridad el número de veces por lo menos que nuestra tecnología".	Dr. Jeong-Chan Ra, leader of RNL Bio Stem Cell Research Institute, also said that it is an ethical imperative that governments offer patients suffering from incurable diseases the right to participate, not only in this kind of studies, but also in therapies with obvious potential once they had been tested for ensuring safety.

4.5 Bilingual self-made glossary

Source language (ES)	Target language (EN)	Description
Acetilcolina (n)	Acetylcholine	Collocation(s): Acetylcholine production/ acetylcholine levels
Ansiedad (n)	Anxiety	Collocation(s): Anxiety disorder/ social anxiety/ anxiety attacks
Atrofia (n)	Atrophy	Synonym: shrinking
Beta-amiloide (n)	Beta-amyloid	Collocation(s): Beta-amyloid build-up/ To increase beta-amyloid
Degenerativo (adj)	Degenerative	Collocation(s): Degenerative change/ degenerative disorder/

		degenerative disease
Demencia (n)	Dementia	Collocation(s): To cause dementia/ to develop dementia
Demencia por cuerpos de Lewy (n)	Lewy body dementia	Collocation(s): Symptoms of Lewy body dementia / risk factors for Lewy body dementia
Depresión (n)	Depression	Collocation(s): To cause depression / severe depression
Diagnóstico (n)	Diagnosis	Collocation(s): Early diagnosis
Enfermedad de Alzheimer (n)	Alzheimer's disease	Acronym: AD
		Collocation(s): To develop AD/ risk for AD/ To suffer from AD/ To predict AD/ To prevent AD/ severe AD/ early-stage AD
Enfermedad de Parkinson (n)	Parkinson's disease	Acronym: PD
Memoria (n)	Memory	Collocation(s): Short-term memory/ long-term memory
Mutación (n)	Mutation	Collocation(s): Gene-genetic mutation
Neurofibrilla / nudo neurifibrilar (n)	Neurofibrillary tangles	

Neurotransmisor (n)	Neurotransmitter	Collocation(s): Neurotransmitter release/ inhibitory neurotransmitter
Placa amiloide (n)	Amyliod plaque	Collocation(s): To accumulate amyloid plaques/ amyloid plaque deposits
Placa neurítica (n)	Neuritic plaque	Collocation(s): Neuritic plaque density/ neuritic plaque formation
Placa senil (n)	Senile plaque	Collocation(s): Senile plaque formation
Tau (n)	Tau	Collocation(s): Tau levels

5 Conclusion

This final degree project has consisted of the translation of three popular science articles from Spanish into English. The translation process has involved the analysis of the source texts, the creation of a translation memory and a monolingual corpus in English. Through the analysis of the texts, the main characteristics have been identified. Those characteristics have been followed for searching the appropriate texts to feed the monolingual corpus and the translation memory. As explained before, the translation memory has been formed by texts originally written in English and their translations into Spanish. The TM has been used while translating in order to find matches with the source texts, and also to find equivalents of some terms and expressions. On the other hand, the monolingual corpus has been fed with English texts that belong to the same genre as the source ones, and also dealing with the same topic. This tool has been really helpful for consulting the real usage of some of the equivalents, as well as for analyzing certain collocations. In addition, a self-made bilingual glossary has also been a relevant

tool for this project, since it has helped during the translation of the texts with the equivalents and collocations. The combination of the three tools has made faster and easier the process of translation.

From my point of view, the elaboration of this project has contributed to the improvement of my skills as a future translator.

The three main tools built for this project can be improved and enlarged for future projects as a freelance translator or even for a post graduate degree in translation. The monolingual glossary could be enlarged with new texts, for achieving a higher number of words, and thus obtaining more collocations. The translation memory can also be fed with new translations, and as it grows, the process would be faster and better. Finally, the bilingual glossary could be enriched with new terms related to Alzheimer's disease, accompanied with their corresponding description. Therefore, it can be concluded that this project has been useful for improving my knowledge and skills as a future translator, but it can also be helpful for new research projects.

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