AI-powered translation tools, combined with pre-translation measures and human editing, can increase translation speed compared with pure human translation, with no compromise on translation quality.

The translation processing speed increased by >500-fold with the AI tool versus human translation, which was within the expected parameters. Human review and editing were required for all materials before their further use in medical publications. Translation was not successful in specific types of documents, for which pre-translation measures had to be developed. The major challenges in translation quality remained in language-specific issues and technical terminologies, for which personnel training and human review were unavoidable to maintain the quality of subsequent documents.

AI-powered translation measures

- **Situation**: Images in a PDF
  - **Action**: Use human translation

- **Situation**: Comments in a Word file
  - **Action**: Use in-house developed C# script

- **Situation**: Tables and figures in a PowerPoint file
  - **Action**: Re-create the tables and figures and translate via T400 or ask client for the source files

- **Situation**: Datasheets as a large-size Excel file containing the same terms repeatedly
  - **Action**: Use Excel macros developed in-house to: 1. Create a corresponding table for Japanese and English terms 2. Run macros to find and replace words

**Results**

- Process was setup for translation to be reviewed and manually edited by a bilingual medical writing expert.
- The translation processing speed and review times were compared between this process and that with pure human translation using a similar set of 17 documents from previous projects, normalizing for document length and type.
- Quality of AI-powered translation was assessed using a qualitative 5-point scale by the same expert who had handled human- and machine-translated documents on these projects.

**Challenges in AI translation**

- **Proper nouns**
  - **Examples**: Human names and company or university names
- **Japanese medical terms that have specific English counterparts**
  - **Japanese language nature**
  - **Examples**: Tumor response coded with the Response Evaluation Criteria in Solid Tumors
- **Sentences spanning across two paragraphs**
  - **Examples**: Phrases including parentheses, brackets, or superscripts

**Summary**

- AI-powered translation has increased efficiency and decreased the workload for translation and human review.
- Personnel training and process improvement based on case-specific incident logs have enhanced the integration of AI tools into workflows traditionally dominated by pure human translation.

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**Reference**


**Conflicts of interest**

All authors are full-time employees of Cactus Life Sciences (part of Cactus Communications).