

Extraction of Argumentation Structures

Research question:

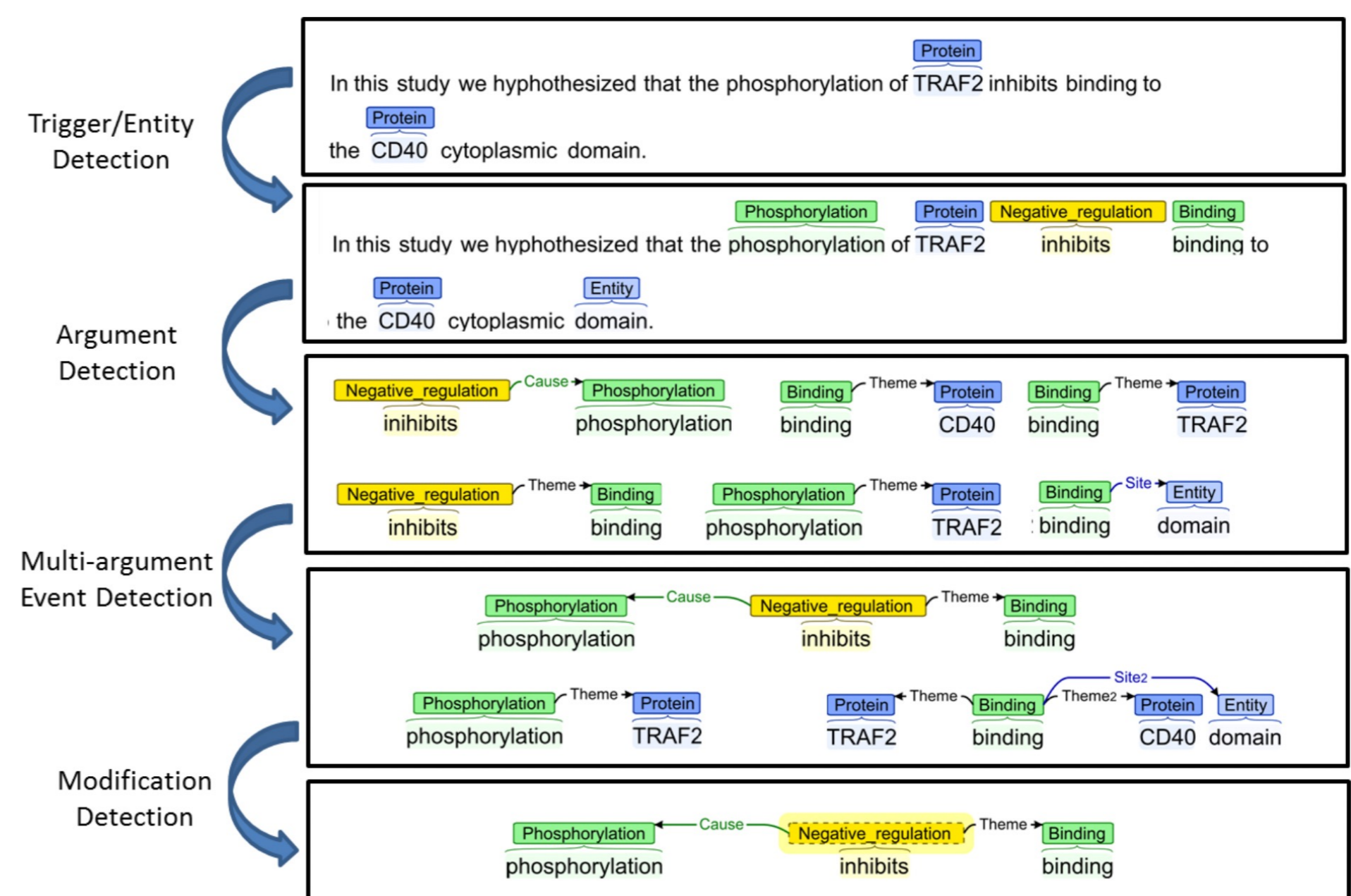
- Clinicians need fast and easy access to documents relevant to their respective case
- The mere occurrence of an entity in a document does not offer sufficient information to decide whether the document is relevant for a case or not
- To decide upon relevance, the argumentation structure the entity is used in must be examined
- Challenges
 - Implicit [8] and explicit argumentation
 - Individual writing styles
 - Specific terminology
 - Specific document types
 - Data availability

Solution approach

- Create information extraction models capable of recognizing and annotating argumentation structures in medical documents
- To train these models, create a corpus from medical documents with manually annotated argumentation structures
- If possible (anonymization of data necessary) publish reference corpus
- Transfer of corpora to other languages to increase data availability

State of the art:

- Extraction of explicit argumentation structures mainly done in argumentative essays [7], social media [9] and medical diagnostics [6]
- Implicit argumentations still difficult
- Tools: (partial) semantic equivalence of statements [1,4]



Extraction of arguments in biomedical articles [5]

Integration:

- Integration into the UIMA/DKPro text analysis architecture [2, 3]
- Re-trainable for new data and application areas
- Connection via SHIP App interface



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References

1. Benikova D, Zesch T., Same same, but different: Compositionality of paraphrase granularity levels, In Proc. of RANLP, 2017.
2. Daumke, P., Heitmann, K. U., Heckmann, S., Martiinez-Costa, C., & Schulz, S. Clinical Text Mining on FHIR. Studies in Health Technology and Informatics, 264, 83–87, 2019
3. Horsmann T., Zesch T., DeepTC – An Extension of DKPro Text Classification for Fostering Reproducibility of Deep Learning Experiments, In Proceedings of LREC 2018.
4. Levy O., Zesch T., Dagan I., Gurevych I., Recognizing Partial Textual Entailment, In Proceedings of ACL, 2013.
5. Miwa M., Thompson, P., McNaught, J., Kell D.B., Ananiadou, S. Extracting semantically enriched events from biomedical literature. BMC Bioinformatics, 13:108, 2012.
6. Schulz, C., Meyer, C. M., Kiesewetter, J., Sailer, M., Bauer, E., Fischer, M. R., Fischer, F., Gurevych, I.. Analysis of Automatic Annotation Suggestions for Hard Discourse-Level Tasks in Expert Domains. In Proceedings of ACL (pp. 2761–2772), 2019
7. Stab, C., Gurevych, I. Parsing argumentation structures in persuasive essays. Computational Linguistics 43.3, 619–659, 2017
8. Wojatzki M., Zesch T., Stance-based Argument Mining – Modeling Implicit Argumentation Using Stance, In Proc. of KONVENS, 2016
9. Wojatzki M, Zesch T. Itl.uni-due at SemEval-2016 Task 6: Stance Detection in Social Media Using Stacked Classifiers. In Proceedings of the 10th International Workshop on Semantic Evaluation (SemEval-2016); San Diego, California.