

## **Abstract INCREASE**

Accomplished rheumatologists, -omics and imaging research experts in rheumatoid Arthritis (RA) and specialists in data analysis and IT-technology have integrated extraordinary medical knowhow and knowledge in secure handling of sensitive patient data to develop an INnovative Platform for Data Collection, Retrieval and Evaluation in Digital Diagnostics and ReSEarch (INCREASE) for RA.

The novel platform resolves the fundamental predicaments of canonical, narrative-based, clinical documentation, information analysis and reporting. The canonical format of clinical items is replaced with digital objects that are detailed with attributes and properties following uniform, standard nomenclature. Storage in a searchable database enables algorithms to identify items and events of interest for interoperable analysis with other digital datasets or numerical data, e.g. laboratory results. Thus, limited data integration from various internal and external sources and costly migration of programmes and complex adaptations of interfaces are averted, whilst data remain in their original policy space. Searchability and algorithmic evaluation across large data pools enable a detailed, real-time personalised health status assessment, fully digital clinical decision support and the creation of defined cohorts for comparability over time and against a benchmark of care to continuously optimise outcomes and safety.

The novel platform provides a bottom-up, domain knowledge-driven, clinical decision support system. Expediting digital integration of clinical, laboratory and genomic data - using ultrafast enterprise search engine technology (ESET) and software solutions - saves time and resources. In this project the usual clinical data are extended by investigating genomic variants to validate their efficacy for predicting disease course, undesired effects and response to therapy. Inherently, these highly personalised diagnostic features are extendable to any clinical condition of choice.

**Keywords:** enterprise search engine technology, structured data entry, Solr Integrated Wolfram Mathematica, cryptography, secure interoperability, genomics, imaging, pharmacogenetics, prognosis, diagnosis, response to treatment.