Lay summary of research project grant application

1. Objective of the project

a) To establish a standing network across the five Nordic Rheumatology registers, which will create the largest and most versatile system of Rheumatology registers worldwide,
b) To use this harmonized approach for studies of clinical questions in Rheumatoid Arthritis (RA), Spondyloarthropathies (AS/SpA), and Psoriatic Arthritis (PsA).

2. Background

Data from clinical practice is needed to understand the safety, effectiveness, and optimal use of available and emerging treatment options for inflammatory arthritis. We have demonstrated the value of our individual registers in assessing the safety and effectiveness of TNF-inhibitors in RA, AS/SpA and PsA. Many outstanding issues, particularly in AS/SpA and PsA, can, however, only be addressed through collaboration across registers. For this, study protocols and the raw data in each register need to be harmonized such that each register asks exactly the same question and treats its data similarly.

The Nordic countries have similar health-care systems and other national registers (on malignancies, sick-leave, et cetera) that can be linked together. ARTIS (Sweden), DANBIO (Denmark), NOR-DMARD (Norway), ROB-FIN (Finland) and ICEBIO (Iceland) represent some of the largest registers of inflammatory arthritis and their biological therapies.

3. Methods and approach

We will take a stepwise approach:
(i) Register enrichment: In each country, we will link together data on RA, AS/SpA, and PsA from the clinical Rheumatology register with data from other nationwide registers, and create country-specific register linkage databases.
(ii) Harmonisation of study protocol and data definitions: For each specific sub-project, we will agree on a statistical analysis protocol, and exact definitions for exposure, outcome, and covariates. Besides study-specific definitions, this work will result in a collection of "standard" definitions for data harmonisation regardless of specific research question.
(iii) Data curation: In each country, we will map our raw-data to this protocol so the linkage database forms a curated study-specific dataset.
(iv) Analysis: We will export each database to one centre for analysis or individually analyse each database and combine the country-specific output into one result.

This approach will be applied to "generic" questions, such as how to best handle comorbidities and treatment channeling in observational research, and also to specific safety and effectiveness questions.

4. Primary and secondary outcome measures (if appropriate)

Study outcomes include generic *operational measures* such as "preferred comorbidity adjustment", and specific *safety outcomes* such as adverse pregnancy outcomes, *effectiveness outcomes* such as differences in response rates, and *societal outcomes* such as work-ability.

5. Recruitment of participants (if appropriate)

Register-based studies: no patients will be physically recruited.

6. Inclusion and exclusion criteria (if appropriate)

The project encompasses data on RA, AS/SpA, and PsA. No patients will be excluded.

7. Expected benefits for patients

Our project addresses unmet clinical needs that correspond to impediments for active living and healthy ageing for individuals with inflammatory arthritis. We expect the project to deliver “specific” benefits in terms of increased knowledge of the safety, effectiveness, and outcomes of the treatment strategies used in clinical practice, and “generic” benefits in terms of a readiness and competence for continued collaborative work to address emergent needs.

8. Expected benefits for society

Optimized management of inflammatory arthritis will reduce suffering, increase health care efficiency, and reduce not only individual but also societal costs.

9. Burden for patients participating in this study (if applicable: compare burden for intervention group and control group). What methods will be applied to carry out the project?

There will be no active burden on patients. Our observational approach maximizes the use of data already provided.

10. Patient involvement in the design and conduct of the study

Considering that the clinical Rheumatology registers include patient reported data (PROMs), and that the research questions are “clinical” by nature, patient representation and participation is critical for formulating and prioritizing the relevant research questions, to ensure that these are addressed in a way that makes sense from a patient perspective, and to contextualise and disseminate the results.

Building on our collaborations, in each country, between the Rheumatology register and the patient organization, we will establish a *Patient Advisory Panel* (1-2 members per country) with adequate representation of age, gender, and diagnosis. The Panel will actively participate at the biannual meetings (a specific budget for travel and accommodation is allocated), and provide input on the design and performance of each sub-project. The Panel will also serve as liaison between the project and the national patient organizations on general issues such as data protection and perceptions of personal/data integrity, and, depending on focus, to suggest additional *patient research partners* for the specific projects.