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Secondary data use of tocilizumab clinical studies to address regulatory needs for rare and pediatric trials

Submission date
12/01/2026

Recruitment status
No longer recruiting

Registration date
16/01/2026

Overall study status
Ongoing

Last Edited
16/01/2026

Condition category
Musculoskeletal Diseases

[ ] Prospectively registered
[ ] Protocol
[ ] Statistical analysis plan
[ ] Results
[ ] Individual participant data
[X] Record updated in last year

Plain English summary of protocol

Background and study aims
Rare diseases (RD) affect up to 36 million people across the EU. Although many medicines have been authorized, 95% of these diseases still have no treatment options. It is difficult to test new drugs for rare diseases because there are very few patients, and their symptoms can vary widely. This makes it hard for regulators to decide if a new treatment is safe and effective.
The INVENTS project aims to solve these problems by using advanced computer modeling and simulation methods. By using existing data from previous clinical trials, researchers will develop new evidence tools and in silico trials (computer-simulated trials). These tools will help predict how well a treatment works, even when only a small amount of patient data is available. The goal is to make the drug approval process faster and more reliable so that patients with rare diseases can access life-saving treatments sooner.

Who can participate?
This specific study is a retrospective study, meaning it uses data that have already been collected from past clinical trials. No new patients are being recruited to join this study. The data used in this research comes from around 10,000 participants who took part in 20 previous studies of the drug tocilizumab. These participants included:
1. Adult patients with rheumatoid arthritis (a common inflammatory disease).
2. Adults and children with rare inflammatory diseases, including:
2.1. Polyarticular juvenile idiopathic arthritis
2.2. Systemic juvenile idiopathic arthritis
2.3. Giant cell arteritis
2.4 Systemic sclerosis

What does the study involve?
Researchers will analyze existing data from the 20 tocilizumab trials to build and test mathematical models. The study involves:
1. Data analysis: using computer software to look at how the drug moves through the body (pharmacokinetics) and how it affects the disease (pharmacodynamics).
2. Comparison: comparing traditional trial results with results generated by new modelling

methods to see if the models are accurate.
3. Virtual patients: creating virtual patient cohorts to simulate how different groups of people might respond to a treatment.
The team will look at patient characteristics (like age and weight), drug doses, blood test results (like C-reactive protein), and physical symptoms (like joint swelling or skin thickness) and disease scores that were recorded in the original trials.

What are the possible benefits and risks of participating?
Because this study uses secondary data (information already collected years ago), there are no direct physical risks to the participants, and they do not need to take any new medications or attend extra appointments.
While individual participants do not benefit directly, the project will help future patients with rare diseases by making it easier and faster to develop and approve new treatments.
The main risk in this type of research is data privacy. To minimize this, all data is pseudonymized, meaning names, initials, and specific dates are removed or changed so that individuals cannot be easily identified. The data is kept in a highly secure environment managed by the Health Data Hub (HDH).

Where is the study run from?
The study is led by INSERM (the French National Institute of Health and Medical Research) in France. The data controller responsible for the project is F. Hoffmann-La Roche Ltd based in Basel, Switzerland. Research is carried out by a group (consortium) of experts from universities and institutions across Europe, including the UK, Netherlands, Austria, Sweden, the Netherlands and Germany.

When is the study starting and how long is it expected to run for?
The original clinical trials provided data from patients who were enrolled between 2005 and 2016. For this new research project, data analysis is scheduled to take place from November 2024 to October 2029. The results and the computer code used are expected to be published between 2027 and 2031.

Who is funding the study?
INVENTS has received funding from the European Union's Horizon Europe Research and Innovation program under grant agreement 101136365, the Swiss State Secretariat for Education, Research and Innovation (SERI) and the UKRI Innovative UK under their Horizon Europe Guarantee scheme. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Health and Digital Executive Agency. Neither the European Union nor the granting authority can be held responsible for them.

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HORIZON-HLTH-2023-IND-06

Study information

Scientific Title
Innovative designs, extrapolation, simulation methods and evidence - tools for rare diseases addressing regulatory needs
(INVENTS project) - secondary data use of tocilizumab clinical studies

Acronym
INVENTs - tocilizumab

Study objectives
The Primary Objective of this study will be to describe per population of interest, the characteristics of patients exposed to tocilizumab from early-stage clinical trials to real-world studies.
Exploratory objectives of this protocol are the objectives defined in the INVENTS project, submitted and accepted by the EU. The INVENTS project is based on 7 objectives: 5 major

methodological objectives, 1 objective focused on regulatory perspectives and 1 objective dedicated to use cases useful for the research. All objectives are complementary and interconnected:
Objective #1 (INVENTS Work package 1): Improving robustness of model-based treatment effect estimation and extrapolation methods
Objective #2 (INVENTS Work package 2): Developing an in silico trials workflow using modelling and simulation, clinical trial and RWD to cope with missing knowledge
Objective #3 (INVENTS Work package 3): Increasing robustness of small population confirmatory trials using validated and credible models
Objective #4 (INVENTS Work package 4): Proposing evidence synthesis approaches using computational models, clinical studies, RWD and virtual cohorts
Objective #5 (INVENTS Work package 5): Developing evidence-based tools for regulatory decision making in RD
Objective #6 (INVENTS Work package 6): Integrating patient engagement and regulatory perspectives
Objective #7(INVENTS Work package 7): provide use cases for the methods developed in work packages 1-5 and provide relevant data and disease area expertise.

Ethics approval required
Ethics approval required

Ethics approval(s)
approved 25/04/2024, CESRESS- Comité Éthique et Scientifique pour les Recherches, les Études et les Évaluations dans le domaine de la Santé (HDH 9 rue Georges Pitard, Paris, 75015, France; -; hdh@health-data-hub.fr), ref: 17337354

Primary study design
Observational

Secondary study design
Secondary data use of 20 studies (interventional and non-interventional) evaluating tocilizumab.

Study type(s)

Health condition(s) or problem(s) studied
Systemic/polyarticular juvenile idiopathic arthritis, giant cell arteritis and rheumatoid arthritis

Interventions
The methods that will be developed during this study will enable the exploitation of novel and improved clinical trial designs, in silico trials and real-world data (including real-world data from patients' care) analysis approaches supporting drug development in rare diseases. The European Medicine Agency and European national regulators (including Health Technology Assessment bodies) will be supplied with a general framework and evidence-tools allowing better informed decision-making thanks to reliable data augmentation techniques and tools allowing studies with small sample sizes to reach high level evidence, ideally matching the level obtained through large, randomized studies. Most importantly, small populations, including patients suffering from rare diseases, will benefit from an increased and faster access to efficacious and safe treatments.
Beyond this project, this workflow could be used in other disease settings when evaluating small sample evidence which is the goal of precision medicine
The mobilization of the clinical data from Roche clinical studies will allow the acquisition of a lot

of additional knowledge to help improve consistency and efficiency of the drug evaluation process for rare disease by augmenting clinical evidence without compromising its scientific integrity and providing regulators assessment credibility criteria.

Intervention Type
Drug

Phase
Not Applicable

Drug/device/biological/vaccine name(s)
tocilizumab

Primary outcome(s)
1. A statistical report containing only aggregated data will be generated describing patient characteristics per population of interest: moderate to severe active rheumatoid arthritis, giant cell arteritis, systemic sclerosis-ild, polyarticular juvenile idiopathic arthritis or systemic juvenile idiopathic arthritis measured using descriptive statistics performed on patient characteristics included in the studies at baseline (before first administration of tocilizumab)

Key secondary outcome(s))

Completion date
31/12/2029

Eligibility

Key inclusion criteria
All patients included in the 20 clinical studies.

Healthy volunteers allowed
No

Age group
All

Lower age limit
1 days

Upper age limit
100 years

Sex
All

Total final enrolment
10096

Key exclusion criteria
GDPR non compliant countries

Date of first enrolment
01/01/2005

Date of final enrolment
01/01/2017

Locations

Countries of recruitment
Scotland

Argentina

Australia

Austria

Belgium

Brazil

Bulgaria

Canada

Czech Republic

Denmark

France

Germany

Greece

Hungary

Israel

Italy

Mexico

Netherlands

Norway

Poland

Portugal

Singapore

Slovakia

Spain

Sweden

Switzerland

Thailand

United States of America

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Sponsor information

Organisation
F. Hoffmann-La Roche

Funder(s)

Funder type

Funder Name
HORIZON EUROPE Health

Alternative Name(s)
Health

Funding Body Type

Government organisation

Funding Body Subtype
National government

Location

Funder Name
Swiss State Secretariat for Education, Research and Innovation (SERI)

Funder Name
UK Research and Innovation

Alternative Name(s)
UKRI

Funding Body Type
Government organisation

Funding Body Subtype
National government

Location
United Kingdom

Results and Publications

Individual participant data (IPD) sharing plan
The datasets to be used in INVENTS were collected during clinical trials. The participants received an information related to the processing of their data for the purpose of the trial. All but two of these clinical trials were conducted prior to the entry into force of GDPR and thus could not have satisfied the requirements introduced by this regulation. In addition, the INVENTS project was not foreseen at the time, and without GDPR, no re-information mechanism was planned.
For concerned persons based in France, Roche will provide a collective information notice on its website (https://www.roche.fr/fr/patients/patient-information-portal.html), with the information content defined by GDPR article 14 in French and in English.

IPD sharing plan summary
Stored in non-publicly available repository