



Low Risk Research Ethics Approval

Project title

PREDICTING ASSOCIATIONS BETWEEN DISEASES, GENES, AND DRUGS USING MACHINE LEARNING AND EVIDENCE-BASED ANALYSIS

Record of Approval

Principal Investigator's Declaration

I request an ethics peer review I confirm that I have answered all relevant questions in this application honestly	X
I confirm that I will carry out the project in the ways described in this application. I will immediately suspend research and request an amendment or submit a new application if the project subsequently changes from the information I have given in this application.	X
I confirm that I, and all members of my research team (if any), have read and agree to abide by the code of research ethics issued by the relevant national learned society.	X
I confirm that I, and all members of my research team (if any), have read and agree to abide by the University's Research Ethics Policies and Processes.	X
I understand that I cannot begin my research until this application has been approved and I can download my ethics certificate.	X

Name: Sudhekksha Sri Chandrasekar Hemamalini (CDS)

Date: 06/06/2023

Student's Supervisor (if applicable)

I have read this checklist and confirm that it covers all the ethical issues raised by this project fully and frankly. I also confirm that these issues have been discussed with the student and will continue to be reviewed in the course of supervision.

Name: Long Chen

Date: 06/06/2023

Reviewer (if applicable)

Date of approval by anonymous reviewer: -

Low Risk Research Ethics Approval Checklist

Project Information

Project Ref	P158865
Full name	Sudhekksha Sri Chandrasekar Hemamalini
Faculty	Faculty of Engineering, Environment and Computing
Department	School of Computing, Maths and Data Science
Research centre	Computational Science and Mathematical Modelling
Supervisor	Long Chen
Module Code	CDS
EFAAF Number	
Project title	PREDICTING ASSOCIATIONS BETWEEN DISEASES, GENES, AND DRUGS USING MACHINE LEARNING AND EVIDENCE-BASED ANALYSIS
Date(s)	19 May 2023 - 08 Aug 2023
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Project Summary

This research study focuses on using the PharmGKB database to forecast relationships between different entities. By employing machine learning techniques and evidence-based analysis, the aim is to predict associations between diseases, genes, and drugs. The dataset encompasses a wide array of relationship types, such as VariantLocation-Drug, VariantLocation-Disease, Haplotype-Drug, Haplotype-Disease, Gene-Drug, Gene-Disease, and Gene-Gene associations.

An association may indicate the treatment outcome for certain drugs in individuals with a particular disease, rather than a direct link to the disease itself.

To predict associations, machine learning techniques classification models and clustering algorithms are utilized. Classification models determine the association status between pairs of entities while clustering algorithms reveal patterns and similarities between entities without predefined labels. The findings of this study contribute to personalised medicine by providing valuable insights into the connections between diseases, genes, and drugs. Predicting these associations helps make informed decisions regarding treatment outcomes and customized therapeutic approaches.

Names of Co-Investigators and their organisational affiliation(place of study/employer)	
Is this project externally funded?	No
Are you required to use a Professional Code of Ethical Practice appropriate to your discipline?	No
Have you read the Code?	No

Project Details

What are the aims and objectives of the project?	<p>In the age of personalized medicine, it is crucial to understand the intricate connections between diseases, genes, and drugs in order to optimize patient care.</p> <p>In the age of personalized medicine, it is crucial to understand the intricate connections between diseases, genes, and drugs in order to optimize patient care. This research study focuses on using the PharmGKB database to forecast relationships between different entities. By employing machine learning techniques and evidence-based analysis, the aim is to predict associations between diseases, genes, and drugs.</p> <p>The findings of this study contribute to personalised medicine by providing valuable insights into the connections between diseases, genes, and drugs. Predicting these associations helps make informed decisions regarding treatment outcomes and customized therapeutic approaches. The application of machine learning and evidence-based analysis shows promising advancements in pharmacogenomics research and personalized medicine.</p>
Explain your research design and outline the principal method(s) you will use	To predict associations between entities (drug, gene, and disease) machine learning techniques such as classification models and clustering algorithms are utilized. Classification models determine the association status between pairs of entities while clustering algorithms reveal patterns and similarities between entities without predefined labels.
Are you proposing to use a validated scale or published research method/tool?	No

Data Analysis

Does the research seek to understand, identify, analyse and/or report on data/information on terrorism/terrorism policies?	No
Does your research seek to understand, identify, analyse and/or report on information for other activities considered illegal in the UK and/or in the country you are researching in?	No
Are you analysing Secondary Data?	Yes
Is this data publicly available?	Yes
Could an individual be identified from the data? e.g. identifiable datasets where the data has not been anonymised or there is risk of re-identifying an individual	No
Are you dealing with Primary Data involving people?	No
Are you dealing with personal data?	No

Are you dealing with special category data (formerly known as sensitive data)?	No
Is the project solely desk based secondary research?	Yes
Will the data collection, recruitment materials or any other project documents be in any language other than English?	No
Are there any other ethical issues or risks of harm raised by the study that have not been covered by previous questions?	No

External Ethics Review

Question		Yes	No
1	Will this project be submitted for ethical review to an external organisation?		X
	Name of external organisation		
2	Are you submitting to IRAS?		
3	Has this project previously been reviewed by an external organisation?		