

# Regulatory Science Post-Doctoral Fellowship

## Drug-Drug Interaction Detection in Real-World Claims Data and Healthcare Records

*The Harvard Program in Therapeutic Science (HiTS) invites applications for a fellowship position at the Harvard-MIT Center for Regulatory Science. The fellow will work with a multidisciplinary team to develop and evaluate novel computational methods to support automated detection of drug-drug interactions in large and disparate healthcare datasets.*

### ABOUT THE FELLOWSHIP PROGRAM

The Harvard-MIT Center for Regulatory Science is a partnership between Harvard, MIT and the FDA, focused on building innovative approaches for the development and evaluation of medical products. Working across academia, industry, and government institutions, the Center promotes regulatory science through research and education programs, uniting stakeholders under a common mission: to promote optimal patient health outcomes through biomedical innovation and the availability of safe and effective diagnostics and treatments. The Regulatory Science [Fellows Program](#) draws individuals with diverse expertise who are passionate about applying novel methods in therapeutic science and contributing to the multi-disciplinary community of the Center.

For this position, the Fellow will work with faculty at Harvard in the Department of Biomedical Informatics <https://dbmi.hms.harvard.edu>. The fellow will be based in the Avillach Lab, an interdisciplinary research group focused on the development of cutting-edge techniques for the integration of multiple heterogeneous biological and clinical cohorts with the overarching goal of supporting individualized data-driven healthcare.

### PROJECT DETAILS

The application of healthcare claims data and electronic health records for use in pharmacoepidemiological studies is booming. Drug–drug interactions can be identified by mining such databases, including adverse drug reactions (ADRs) resulting from the prescription of a combination of drugs (CADRs), considered a special class of drug-drug interactions. While many ADRs can be anticipated and hence avoided, CADRs are highly complex and challenging to identify and, as a consequence, have not been well studied. CADRs may represent as many as 30 % of unexpected ADRs and their elucidation is of particular interest to the FDA.

The fellowship project will develop new signal detection algorithms using data mining techniques in real-world healthcare data derived from claims and electronic healthcare records. The project will aim to identify potential pharmacovigilance signals concerning drug-drug interactions across multiple diseases and syndromes.

**Research activities include, but are not limited to:**

- Extract and analyze information from a nationwide claims database including 67 million subjects
- Extract and analyze information from healthcare records in an academic pediatric hospital including 1.8 million patients
- Develop and test methods to detect adverse drug reactions from billing codes, drug prescriptions and lab value results
- Disseminate findings through national and international conferences and in peer-reviewed scientific publications

**Basic Qualifications**

- PhD in computer science, engineering or a related field
- Expertise in SQL query language
- Expertise in R or Python programming languages

**Application Procedure and Requirements**

Applications will be accepted until the position is filled. Please include the following when applying:

- Curriculum vitae
- Cover letter and a 2-page description of relevant experience as a single PDF
- Project description jointly developed between the candidate and mentor(s)
- DOI or PMCID of up to three relevant publications

Selected candidates will be asked to provide letters of reference.

**Position Description**

Host Institution: Harvard Medical School

Appointing Department: Harvard Program in Therapeutic Science

Research Laboratory: Paul Avillach

Location: Boston, MA

Category: Scientist

Other responsibilities: no administrative or teaching obligations

Duration of fellowship: 2 years

**EEO Statement**

We are an equal opportunity employer and all qualified applicants will receive considerations for employment without regard to race, color, religion, sex, national origin, disability status, protected veteran status, gender identity, sexual orientation, pregnancy and pregnancy-related conditions or any other characteristic protected by law.

**Contact**

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