Mutation-Drug Sensitivity Data Resource (MDSDR): A Comprehensive Resource for Studying and Addressing Drug Resistance

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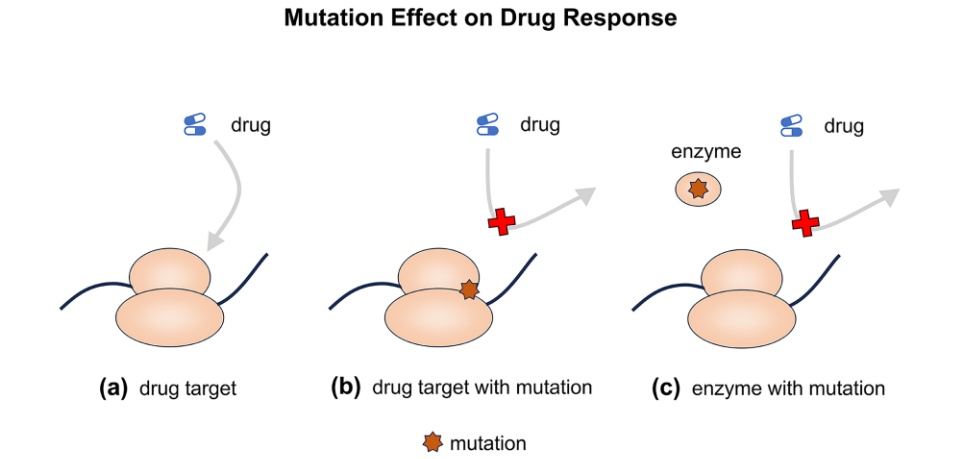
Problems & Ideas

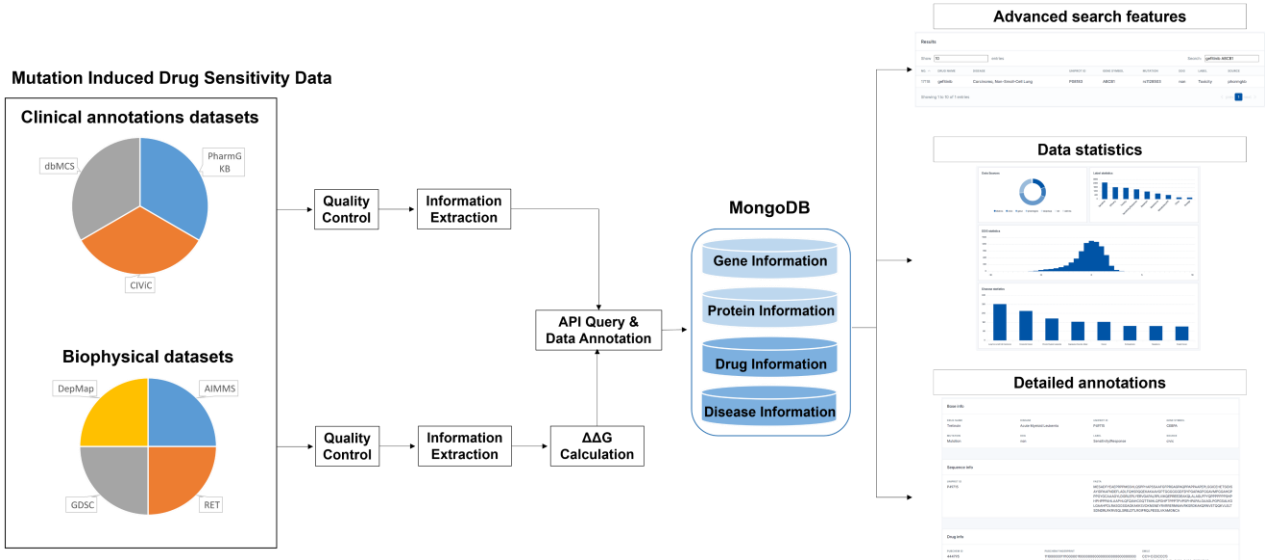
- Problems of existing drug resistance databases:
  - Existing databases often only contain experimental data on protein-ligand affinity changes or clinical notes on mutations leading to drug resistance, lacking comprehensive data.
  - Many databases lack clinical annotations, gene-protein alignment, disease information, and detailed drug properties.
- Ideas: A unified platform includes experimental data on protein-ligand affinity changes, clinical notes on mutations, gene and protein alignment, disease information, and comprehensive drug annotations.



Effect of mutations on drug response: (a) Drug binds to its target protein. (b) Mutation in target protein prevents binding, causing resistance. (c) Mutation in enzyme that aids binding also prevents the drug from binding, causing resistance.

Main Contributions

- Contributions:
  - MDSDR integrates data from seven diverse sources, providing a comprehensive resource for studying drug resistance;
  - MDSDR includes novel annotations and aligns gene mutations with protein mutations for advanced genomic-proteomic analysis;
  - MDSDR offers an advanced web interface with powerful search capabilities for easy access to mutation, drug, and disease data.



Overview of MDSDR's architecture