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Commentary

# Clinical Pharmacogenomics: Investigating Novel Pharmacogenomic Variants using Next Generation Sequencing

**Zhou Koya***

*Department of Psychological Medicine and Clinical Neurosciences, Cardiff University, Cardiff, United Kingdom*

## DESCRIPTION

Pharmacogenomics (PGx) is the study of how a person's genetic makeup affects their response to drugs. It is an emerging field that has the potential to revolutionize clinical care by enabling physicians to customize drug treatment to an individual's genetic profile. This approach has been shown to improve patient outcomes and reduce adverse drug reactions. The goal of pharmacogenomics is to identify genetic variants that influence drug response in order to optimize drug therapy. The identification of these genetic variants is typically done through genotyping, which looks at specific regions of the genome known as Single Nucleotide Polymorphisms (SNPs). However, this approach can be limited due to the inability to detect novel variants or rare variants that may have a greater impact on drug response. Next-Gneration Sequencing (NGS) has revolutionized the field of pharmacogenomics by providing a more comprehensive view of an individual's genome and allowing for the detection of novel and rare variants. NGS uses short sequences from millions of DNA fragments at once, enabling researchers to sequence entire genomes or targeted regions with greater accuracy than ever before. This method has been used successfully in many studies, including those investigating novel pharmacogenomic variants associated with drug response. The use of NGS in pharmacogenomics research provides a powerful tool for uncovering novel and rare variants associated with drug response, allowing physicians to better tailor therapy for individual patients based on their unique genetic makeup. As we continue to investigate these novel pharmacogenomic variants using NGS technology, we can look forward to improved patient care and better outcomes in clinical settings.

Next generation sequencing (NGS) is revolutionizing the field of pharmacogenomics (PGx). NGS has enabled researchers to uncover novel pharmacogenomic variants and investigate their effects on drug response. It is a powerful tool that can be used to identify genetic variants associated with drug response, as well as to understand the complex interaction between genetic factors and drug metabolism. NGS is a high-throughput sequencing technology that enables researchers to sequence millions of nucleotide bases in a short amount of time. This makes it possible to quickly sequence an entire genome or large regions of interest. NGS also allows for the detection of Single Nucleotide Polymorphisms (SNPs), insertions, deletions, and other mutations at an unprecedented scale. This makes it ideal for use in PGx studies, where it can be used to identify genetic variants associated with drug response and toxicity. The use of NGS in PGx research has enabled researchers to uncover novel pharmacogenomic variants that were not previously known or understood. By identifying these variants, researchers can gain insight into how drugs interact with the body's genetic makeup and how this affects drug response. For example, by using NGS to study the genomic regions associated with warfarin metabolism, researchers have identified several SNPs that are associated with warfarin sensitivity. These findings have been used to develop personalized dosing regimens for warfarin therapy based on a patient's genetic makeup. In addition to identifying novel pharmacogenomic variants, NGS can also be used to investigate the functional consequences of such variants on drug response and toxicity. By combining functional assays with NGS data, researchers can gain insight into how certain genetic variations influence drug response and toxicity. This information can then be used to develop personalized therapies tailored specifically for individual patients based on their genomic profiles. Overall, next generation sequencing is revolutionizing clinical PGx by enabling researchers to uncover novel pharmacogenomic variants and investigate their effects on drug response and toxicity at an unprecedented scale. By leveraging this powerful tool, researchers are now able to develop more effective personalized therapies for individual patients based on their genomic profiles.

Pharmacogenomic testing has become increasingly popular in recent years as a way to identify genetic variants that can affect how individuals respond to certain drugs and therapies. With the advent of next-generation sequencing (NGS), it is now

**Correspondence to:** Zhou Koya, Department of Psychological Medicine and Clinical Neurosciences, Cardiff University, Cardiff, United Kingdom, E-mail: koya.lu.ck.zhou@email.com

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possible to investigate novel pharmacogenomic variants that may be associated with drug response. Here, we will discuss some of the benefits of utilizing NGS for this purpose. NGS allows researchers to analyze an individual's entire genome in a single test. This means that researchers can identify a wide range of genetic variants within a small amount of time, allowing for more comprehensive results than traditional methods of pharmacogenomics testing. In addition, NGS offers the ability to detect rare genetic variants that are not typically identified by traditional methods.