

References

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Bring Technology to Life



Precision Medicine



BACKGROUND

Aspirin, chemically known as acetylsalicylic acid, has long been used as a preventive measure against cardiovascular, cerebrovascular and peripheral arterial diseases by inhibiting platelet aggregation¹. Despite its widespread application, adverse drug reactions, including aspirin-exacerbated respiratory disease (AERD), aspirin-induced urticaria/angioedema (AIU) and gastrointestinal bleeding, limit aspirin's clinical utility in some patients². Furthermore, the phenomenon of "aspirin resistance" complicates its clinical effectiveness, where a significant number of patients do not respond as expected to aspirin therapy¹. This resistance hints at a genetic predisposition, with specific single nucleotide polymorphisms (SNPs) are likely to influence an individual's reaction to the drug³.

Key genetic variants such as the integrin beta3 (ITGB3) c.176 T>C, which affects the activity of the platelet glycoprotein (GP) IIb/IIIa receptor involved in aggregation, and the -444A/C polymorphism in the leukotriene C4 synthase (LTC4S) gene has been implicated in aspirin-induced urticaria^{4,5}. The platelet endothelial aggregation receptor (PEAR1) genetic polymorphisms stand out as significant genetic modifiers of platelet aggregation, especially under aspirin treatment^{6,7}. Moreover, variants in prostaglandin endoperoxide synthase 1 (PTGS1) gene, which encodes the primary target of aspirin i.e. cyclo-oxygenase 1 (COX-1), have been reported to associate with alterations in platelet reactivity⁸. Additionally, the GPIBA polymorphisms may also serve as biomarkers of poor responsiveness to aspirin in certain ethnic groups⁹.

ASPIRIN PERSONALIZED MEDICATION SOLUTIONS

Tianlong Aspirin Personalized Medication Solution is designed to rapidly determine the presence of those key genetic single nucleotide variants, including ITGB3 (c.176 T>C), LTC4S (c.-444 A>C), PEAR1 (c.-9-3996 G>A), PTGS1 (c.-842 A>G) and GPIBA (c.482 C>T) in specimen with its exclusive pharmacogenomic reagents and the Fascan 48E multi-channel fluorescence quantitative analyzer. The results can provide genetic clues to drug tolerance and potential risk assessment towards adverse drug reactions, as well as to guide rational application of aspirin in clinical practice.

Genotype Detection and Suggestions for Aspirin Therapy

Gene	Gene Locus	Genotype	Score	Risk Assessment and Medication Suggestion
ITGB3	c.176 T>C	TT	2	<p>0 ≤ Score ≤ 2.5: Low response to aspirin. Switching to other anti-platelet drugs is recommended.</p> <p>3 ≤ Score ≤ 5: Intermediate response to aspirin. Use as recommended dosage with close follow-up.</p> <p>5.5 ≤ Score ≤ 8: High response to aspirin. Use as recommended dosage.</p>
		TC	0.5	
		CC	0	
PEAR1	c.-9-3996 G>A	GG	2	
		GA	1	
		AA	0	
PTGS1	c.-842 A>G	AA	2	
		AG	1	
		GG	0	
GPIBA	c.482 C>T	CC	0	
		CT	1	
		TT	2	
LTC4S	c.-444 A>C	AA	0	Low risk of allergic urticaria
		AC	1	Medium risk of allergic urticaria
		CC	2	High risk of allergic urticaria

Examples of Detection Results

Gene	Gene Locus	Genotype (Score)	Risk Assessment and Medication Suggestion
ITGB3	c.176 T>C	TT (2)	Sensitivity score: 6. High response to aspirin, use as recommended dosage.
PEAR1	c.-9-3996 G>A	GG (2)	
PTGS1	c.-842 A>G	AA (2)	
GPIBA	c.482 C>T	CC (0)	Adverse reaction rate score: 0. Low risk of allergic urticaria after using aspirin.
LTC4S	c.-444 A>C	AA (0)	

Clinical Significance



Inform personalized treatment strategies and guide rational medication of aspirin to improve therapeutic outcomes, as well as to minimize adverse effects in at-risk individuals.

Ordering Information

Product Name	Specification	Specimen	Target Gene Loci
LigSeq Reagent Kit (SNP-U7)	20 T/Kit	2 mL of EDTA anticoagulated whole blood	ITGB3 (c.176 T>C), LTC4S (c.-444 A>C), PEAR1 (c.-9-3996 G>A), PTGS1 (c.-842 A>G), GPIBA (c.482 C>T)

Features



Accurate Result

Powerful software analysis; Internal control can monitor the whole detection procedure and ensure the accuracy of the detection results reaching to over 99%.



Easy Operation

Pre-filled reagents; No need for sample extraction; No requirements for specialized equipment or techniques.



High Efficiency

Results are available in approximately 70 min after loading samples; Reports are easy to read.



Integrated Solution

Tianlong integrated solution from devices to reagents can ensure great compatibility and minimized systematic errors.

Assay Workflow



1 Sample Collection



2 Sample Detection



3 Analysis and Report

*Detection directly after sample collection and report in about 70 min.