GX SCIENCES Innovative Genomic Solutions

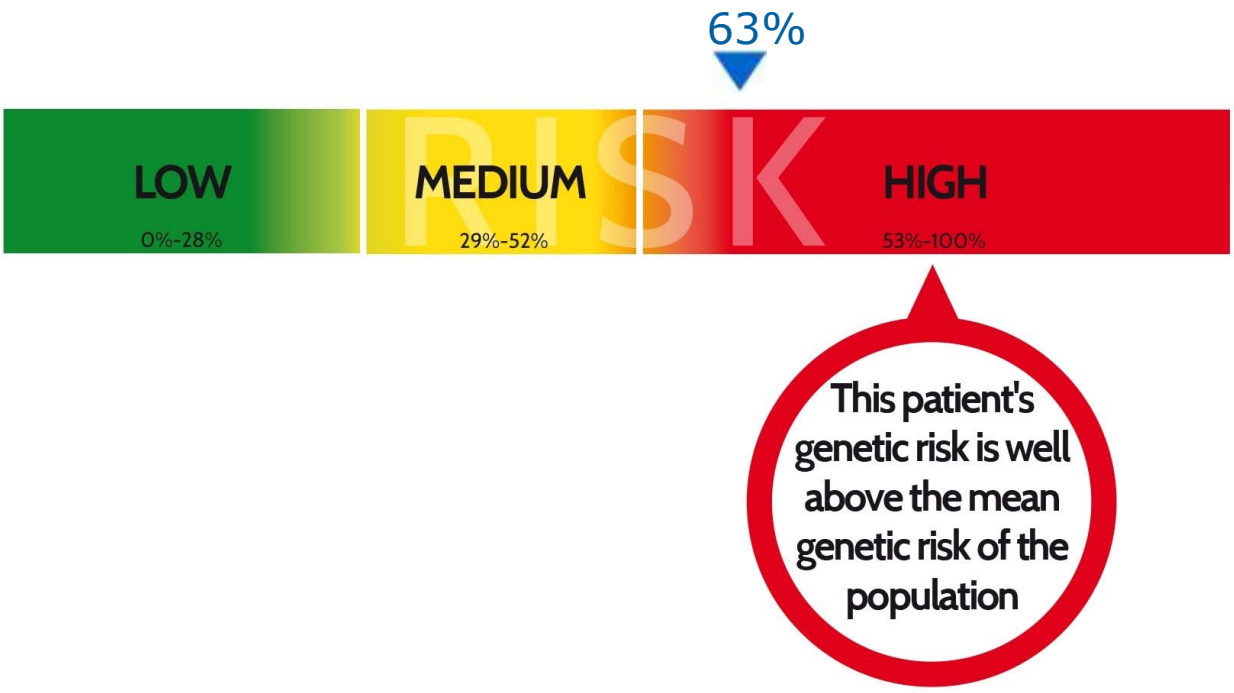
DIABETESpredict®

GENETIC RISK ASSESSMENT

Report date:	06/12/19	Sample ID:	PATIA-05
Test:	Genotyping	Name:	PATIA-05
Specimen:	Buccal swab	D.O.B.:	01/01/79
Collection date:	04/02/19	Ethnicity:	Caucasian
Provider:	Validation Test	**Parental history T2D:**	**Yes**
		BMI (Body Mass Index):	**29.39 kg/m²**

RESULT

THE RISK OF TYPE 2 DIABETES



The risk score reported is calculated by an algorithm that integrates the genotype of the patient with data on the patient's ethnicity, weight, height and family history of diabetes. If ethnicity information is not provided by the patient, a global algorithm will be applied that uses average predictive values across populations for each of the genetic polymorphisms analyzed. If information on family history, weight or height is not provided by the patient, an algorithm will be applied that does not integrate those factors.

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Genotype

Genes		
SLC16A11	**G**	**G**
INSIGF2	**C**	**C**
HNF1A	**G**	**G**
WFS1	**G**	**G**
SLC30A8	**G**	**G**
PPARG	**C**	**C**
IGF2BP2	**G**	**G**
CDKAL1	**A**	**A**
ADCY5	**T**	**T**
JAZF1	**A**	**G**
HHEXIDE	**C**	**C**
KCNJ11	**T**	**C**
KCNQ1	**C**	**T**
TCF7L2	**T**	**C**
FTO	**C**	**T**
CDKN2AB	**C**	**T**

Red: risk copy
Black: no risk copy

GENES

WFS1
SLC30A8
ADCY5
HHEXIDE
KCNJ11
TCF7L2
INSIGF2
HNF1A
IGF2BP2
CDKAL1
JAZF1
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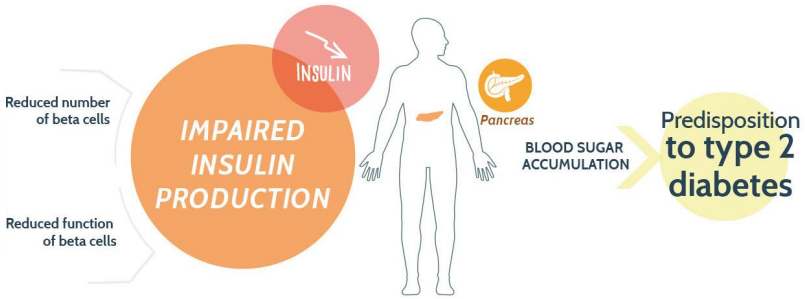
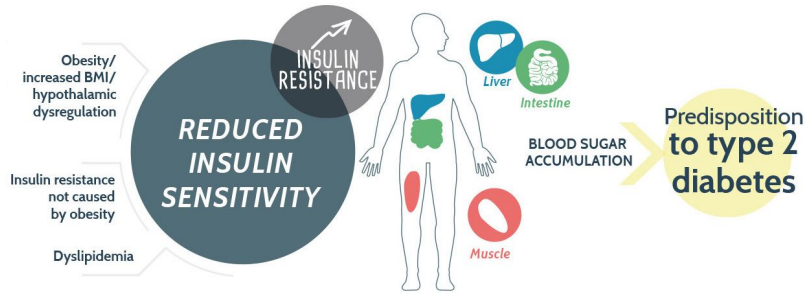
CDKN2AB

GENES

FTO
PPARG
SLC16A11





2 copies of risk polymorphisms have been detected in the genes: WFS1, SLC30A8, ADCY5, HHEXIDE, PPARG ; such polymorphisms are associated with an increased genetic risk of developing type 2 diabetes. In addition, 1 copy of other polymorphisms also associated to type 2 diabetes has been detected in the genes: JAZF1, KCNJ11, TCF7L2, CDKN2AB, FTO.

Methodology. 16 genetic variants (polymorphisms) were genotyped using TaqMan OpenArrays high-precision methodology. These 16 variants are relevant in the development of type 2 diabetes (T2D) and are associated to an increased genetic risk of T2D. The genetic information is integrated with the patient's information of weight, height and parental history of T2D by an algorithm which calculates the % of the combined risk of T2D.

This test does not diagnose type 2 diabetes. A doctor must diagnose type 2 diabetes. These results do not mean that you or your family will necessarily develop type 2 diabetes. These results must be evaluated along with a complete individual and family medical history as well as other laboratory tests results. This test analyses and informs only about certain genetic variants associated to the genetic risk of type 2 diabetes. This genetic test does not exclude that you or your family might develop other diseases.

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GENERAL RECOMMENDATIONS* POST-TEST BASED ON GENOTYPE

SNP in GENE	SUPPLEMENTS	LIFESTYLE	LABORATORY TESTS & FURTHER CONSIDERATIONS
WFS1 **GG**		Genistein Aerobic exercise	Inquire about age - early onset diabetes In- quire about kidney health, hearing and vision
SLC30A8 **GG**	Zinc Antioxidants (Vitamin E, Selenium)	Diet rich in Zinc (beef; beans) Antioxidant diet	Inquire about age -early onset diabetes
PPARG **CC**	Long chain omega-3 fatty acid Docosahexaenoic Acid (DHA) Chromium	Individuals with the CC genotype are more likely to loose weight in weight loss programs Mediterranean diet. Low carbohydrate. Low SFA (saturated fatty acids, in butter and cheese) n-3 polyunsaturated fatty acids (Fish and fish oil, avocado, olive oil) Apple polyphenols Low carbohydrate diet Aerobic exercise	Individuals with the CC genotype are likely to be more sensitive to the negative effects of fats and refined carbohydrates within the diet Consider appropriateness of Metformin
ADCY5 **TT**		Aerobic exercise Yoga practice. Meditation practice Sleep -7-8 hours per night. Manage stress Genistein (legumes)	Inquire about dyskinesia (twitches, tremors), increased muscle tension and low birth weight
HHEXIDE **CC**		Aerobic exercise Yoga practice; Meditation practice. Sleep 7-8 hours per night	Inquire about liver function
KCNJ11 **TC**	Potassium	Potassium rich diet (squash, sweet potato, white beans, broccoli)	Measure HbA1c. Sulfonylureas tend to be more effective Age of diabetes onset tends to be younger
TCF7L2 **TC**	Anti-oxidants (Vitamin E, Selenium)	Mediterranean diet (see below, table footnotes) Antioxidant diet Low milk intake Aerobic exercise Mind-Body practices	Watch for tendencies to anxiety, mood disorders, nicotine and alcohol addiction
FTO **CT**	Long chain omega-3 fatty acid Docosahexaenoic Acid (DHA) Chromium	Caloric restriction (1,100 kcal/day) Long chain omega-3 fatty acid eicosapentaenoic acid, docosahexaenoic acid (salmon, sardines) High protein diet (>60%) Apple polyphenols (abundant in apple skin) Anaerobic exercise	Check HbA1c Inquire about appetite. This gene regulates appetite and satiety. High protein/high omega 3 diet can reduce appetite

*These recommendations should be evaluated in conjunction with the evaluation made by a doctor based on personal and family history, the results of physical examinations and other clinical and laboratory tests. These recommendations are based on a broad literature review. Patia has not conducted clinical studies to support them. Prevention of type 2 diabetes and obesity must include an integrative approach that considers diet, exercise, sleep and rest, emotional health and stress.

MEDITERRANEAN DIET: focus on whole grains, lean protein, and moderate amounts of dairy products and olive oils.
ANTIOXIDANT DIET: Golgi berries, blueberries, dark chocolate, artichoke, beans.
GENISTEIN: flavonoid in legumes and herbs; promotes beta cell function, cAMP signaling, reduces obesity-induced low-grade inflammation.
AEROBIC EXERCISE (also known as cardio): fast walking, running, spinning, swimming, dancing, aerobic classes, kickboxing 30 min 5 days a week or 50 min 3 days a week.
ANAEROBIC EXERCISE: weightlifting, push-ups, squats, sprints, high intensity interval training.
MIND-BODY PRACTICES: meditation, Yoga, Tai-Chi.
METFORMIN: improves insulin sensitivity by increasing peripheral glucose uptake and utilization. Recommended when tendency to insulin resistance.

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METHODOLOGY AND LIMITATIONS

Testing for genetic variation/mutation on listed genes was performed using ProFlex PCR and Real-Time PCR with TaqManŽ allele-specific probes on the QuantStudio 12K Flex. All genetic testing is performed by GX Sciences, 4150 Freidrich Lane, Ste H, Austin, TX. 78744. This test will not detect all the known alleles that result in altered or inactive tested genes. This test does not account for all individual variations in the individual tested. Test results do not rule out the possibility that this in dividual could be a carrier of other mutations/variations not detected by this gene mutation/variation panel. Rare mutations surrounding these alleles may also affect our detection of genetic variations. Thus, the interpretation is given as a probability. Therefore, this genetic information shall be interpreted in conjunction with other clinical findings and familial history for the administration of specific nutrients. Patients shoul d receive appropriate genetic counseling to explain the implications of these test results. Details of assay performance and algorithms leading to clinical recommendations are available upon request. The analytical and performance characteristics of this laboratory developed test (LDT) were determined by GX Sciences' laboratory pursuant to Clinical Laboratory Improvement Amendments (CLIA) requirements.

CLIA #: 45D2144988

This test was developed, and its performance characteristics determined by GX Sciences. It has not been cleared or approved by the FDA. The laboratory is regulated under CLIA and qualified to perform high-complexity testing. This test is used for clinical purposes. It should not be regarded as investigational or for research. rsIDs for the alleles being tested were obtained from the dbSNP database (Build 142).

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