

# Research team develops blood test to predict psychosis risk and most effective treatments

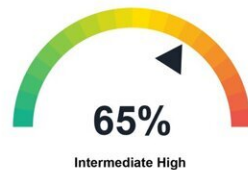
February 8 2024

A.

Physician: XXXX  
CFI SZ 90  
P3 Hallucinations 1  
Age 54  
Gender M

Sample Collected: 4/9/2013, 12:00:00 PM  
Report Created: 5/19/2022, 11:10:00 AM  
Diagnosis: SZA  
Sample ID: phchp297v1

## Hallucinations Score



Chronic Hallucinations Risk\*  
Intermediate High  
58%

### Consider Using:

Top Alternative Treatments for Hallucinations	Match	Top Pharmaceuticals for Hallucinations	Match
American Ginseng	18%	Valproate	46%
Genistein	18%	Fluoxetine	30%
Kososan	18%	Lithium	25%
Menaquinone-4	18%	Clozapine	25%
Juuboside A	16%	Risperidone	21%
Gamma Frequency	13%	Estrogen	18%
S-adenosyl methionine (SAM)	15%	Citalopram	16%
		Carbamazepine	13%
		Vortioxetine	13%

B.

Physician: XXXX  
CFI SZ 90  
P1 Delusions 1  
Age 54  
Gender M

Sample Collected: 4/9/2013, 12:00:00 PM  
Report Created: 5/18/2022, 04:49:00 PM  
Diagnosis: SZA  
Sample ID: phchp297v1

## Delusions Score



Chronic Delusions Risk\*  
Intermediate Low  
30%

### Consider Using:

Top Alternative Treatments for Delusions	Match	Top Pharmaceuticals for Delusions	Match
Berberine	19%	Fluoxetine	38%
Therapy	12%	Valproate	35%
		Clozapine	21%
		Risperidone	20%
		Paroxetine	19%
		Citalopram	12%
		Lithium	12%

Example of prototype report for physicians. Credit: *Molecular Psychiatry* (2024). DOI: 10.1038/s41380-024-02433-8

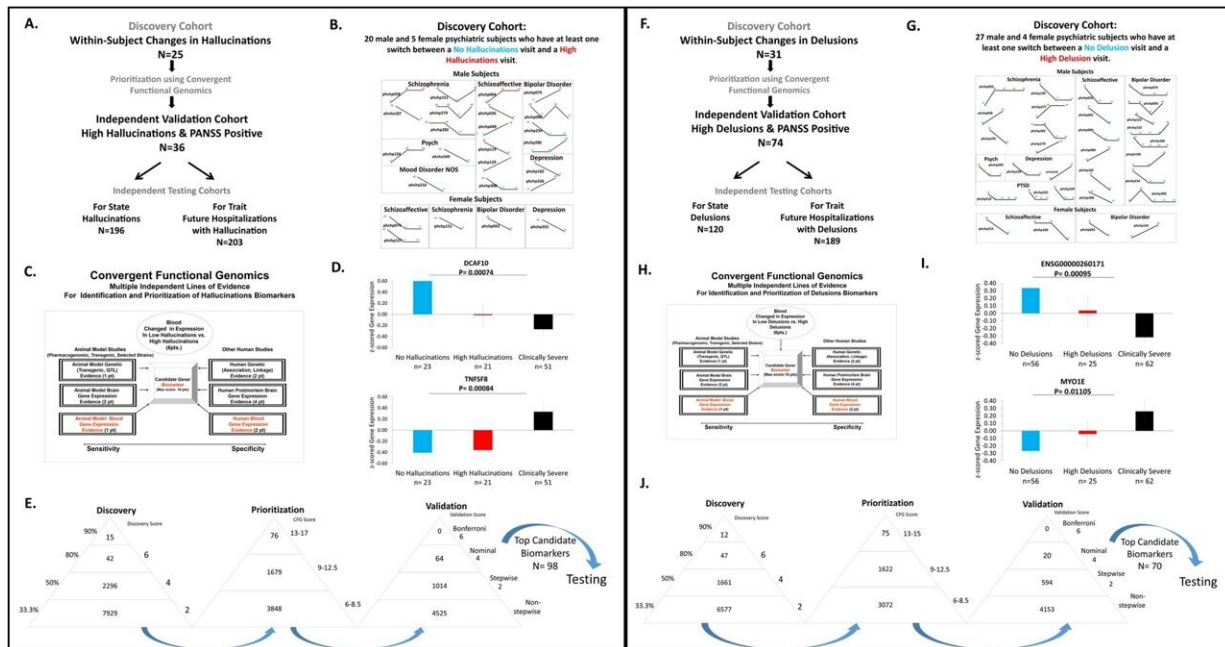
A team of researchers led by Indiana University School of Medicine faculty have developed a breakthrough new blood test for schizophrenia, a psychiatric disorder that includes hallucinations and delusions.

Schizophrenia and related psychotic disorders affect over 3 million people in the United States. The [new test](#) identifies biomarkers in a person's blood that can objectively measure their current severity and future risk for [schizophrenia](#) and match them to treatments that will be most effective for their individual biology.

"Schizophrenia is hard to diagnose, especially early on, and matching people to the right treatment from the beginning is very important," said Alexander Niculescu, MD, Ph.D., Professor of Psychiatry and Medical Neuroscience at the IU School of Medicine, staff psychiatrist and investigator at the Richard L. Roudebush Veterans Administration Medical Center in Indianapolis and senior author on the study.

"Psychosis usually manifests in young adulthood—a prime period of life. Stress and drugs, including marijuana, are precipitating factors on a background of genetic vulnerability. If left unchecked, psychosis leads to accumulating biological damage, social damage, and psychological damage."

In a study [published in \*Molecular Psychiatry\*](#), researchers tested [psychiatric patients](#) that they followed for over a decade. They identified biomarkers that were predictive of high hallucinations and high delusion states, as well as future psychiatric hospitalizations related to hallucinations and delusions. They also studied which biomarkers are targets of existing drugs, which enables the matching of patients to the right treatments.



Discovery, Prioritization and Validation of Biomarkers for Hallucinations and Delusions. **A, F** Cohorts used in study, depicting flow of discovery, prioritization, and validation of biomarkers from each step. **B, G** Discovery cohort longitudinal within-subject analysis. Phchp### is study ID for each subject. V# denotes visit number. **C, H** Prioritization using Convergent Functional Genomics (CFG). **D, I** Validation -biomarkers are assessed for stepwise change from discovery subjects with no symptoms, high symptoms to the validation subjects with clinically severe symptoms, using ANOVA. The histograms depict a top increased and a top decreased biomarker (**E, J**). Number of probesets and scoring at each of the Steps. Step 1 -Discovery probesets are identified based on their score for tracking symptoms and ranked 33% (2 pt), 50% (4 pt) and 80% (6 pt). Step 2- Prioritization with CFG for prior evidence of involvement in psychotic disorders. Maximum of 12 pt. Genes scoring at least 6 pt out of a maximum possible of 18 pt after Discovery and Prioritization are carried forward to the validation step. Step 3- Validation in an independent cohort of psychiatric patients with clinically severe hallucination ( $P3$  or  $P1 \geq 4$ , PANSS  $\geq 21$ ) We selected the top CFE score  $\geq 14$  ( $n = 98$  for hallucinations,  $n = 70$  for delusions) for further testing and characterization. Credit: *Molecular Psychiatry* (2024). DOI: 10.1038/s41380-024-02433-8

The work builds on previous research over the last two decades by Niculescu and his colleagues on blood biomarkers for other psychiatric disorders ([mood disorders](#), anxiety, [post-traumatic stress disorder](#), suicidality risk, pain, and memory disorders).

Niculescu said in general, the best [biomarkers](#) were more predictive than the standard scales used to evaluate someone with hallucinations or delusions, which means the use of this biomarker test can help reduce subjectivity and uncertainty from psychiatric assessments.

"Fortunately, biologically, some of the existing medications work quite well if initiated early in the right patients," Niculescu said. "Social support is also paramount, and once that and medications are in place, psychological support and therapy can help as well. There is still plenty left to understand and apply about cognition and its abnormalities, but there is reason for optimism in this era of emerging precision psychiatry."

**More information:** M. D. Hill et al, Precision medicine for psychotic disorders: objective assessment, risk prediction, and pharmacogenomics, *Molecular Psychiatry* (2024). [DOI: 10.1038/s41380-024-02433-8](https://doi.org/10.1038/s41380-024-02433-8)

Provided by Indiana University School of Medicine

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