AI-Powered DNA-Based Test for Predicting Preterm Birth Risk and Progesterone Treatment Response

Tech ID: 34588 / UC Case 2021-234-0

TECHNOLOGY DESCRIPTION

UCSF researchers have developed a cutting-edge DNA-based diagnostic test leveraging whole genome sequencing and AI to predict genetic predisposition to preterm birth and response to progesterone treatment. Addressing the unmet need for personalized prevention strategies for preterm birth—which affects 10% of pregnancies globally and is the leading cause of neonatal mortality—this technology analyzes mutational loads across 315 protein-coding genes to identify key pathways involved in muscle relaxation and inflammation. Currently in development, the platform improves clinical trial participant selection, accelerates therapeutic discovery by screening ~4,000 compounds, identifying candidate molecules that affect the identified genes, and experimentally validating their therapeutic effects on regulating labor. By offering novel insights into the genomic loci regulated by the progesterone receptor near labor onset, this innovative tool opens doors to diagnostic refinement, personalized medicine, and advancements in preterm birth prevention.

RELATED MATERIALS

- Integrative analysis of noncoding mutations identifies the druggable genome in preterm birth, PMCID: PMC10798565, doi: 10.1126/sciadv.adk1057 - 01/19/2024

PATENT STATUS

Patent Pending

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OTHER INFORMATION

KEYWORDS

Preterm birth diagnostics, Reproductive health, AI-driven mutational scoring, Progesterone treatment prediction, Personalized medicine for preterm birth, DNA-based diagnostic test, Drug discovery for preterm birth prevention, Deep learning in genomic analysis

CATEGORIZED AS

- **Medical**
  - Diagnostics
  - Disease: Women's Health
  - Other
- **Research Tools**

- Nucleic Acids/DNA/RNA
- Screening Assays

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