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Repurposed Drug Combination Therapy for Preterm Birth Prevention

Researchers at Stanford, in collaboration with UCSF, have developed a two-part approach to preventing preterm birth (PTB), the leading cause of infant mortality worldwide. Current treatments, like low-dose aspirin and progesterone, are limited and often ineffective. No approved therapy targets the immune system disruptions that are now understood to drive PTB.

Stanford's Gaudilliere lab has developed two complementary platforms to address this. The first is a drug screening assay that tests how different drugs affect a patient's own immune cells from a single blood sample. This allows doctors to match patients with the treatment most likely to work for them. The second is a combination of two already FDA-approved drugs, aspirin and lansoprazole, shown in early studies to restore immune balance relevant to PTB. Together, these tools offer a personalized approach to PTB prevention for at-risk patients.

Stage of Development:
Proof of concept - In vitro | Planned Clinical Trial

Applications

- Preventive therapy for patients at elevated risk of preterm birth
- Personalized treatment selection platform for high-risk pregnancies
- Screening tool for drug repurposing in other pregnancy complications, such as preeclampsia

Advantages

- Uses two already FDA-approved drugs, lowering development risk and cost
- Addresses multiple immune pathways at once

- Faster and more personalized treatment decisions enabling identification of synergistic drug combinations

Publications

- Jakob Einhaus, Peter Neidlinger, Olivier Fondeur, Masaki Sato, Alexandra Anronikov, Kotaro Miyazaki, Jonas N. Amar, Kazuo Ando, Valentin Badea, Dyani K. Gaudilliere, Maximilian Sabayev, Dorien Feyaerts, Maïgane Diop, Amy S. Tsai, Amelie Cambriel, Edward A. Ganio, Romain Lagarde, Emmeline O'Kelly, Ina A. Stelzer, Julien Hedou, Ronald J. Wong, Yair J. Blumenfeld, Deirdre J. Lyell, Gary M. Shaw, Tomiko T. Oskotsky, Marina Sirota, Linda Giudice, David K. Stevenson, Nima Aghaeepour, Brice Gaudilliere. Single-cell-level digital twins for preterm birth prevention strategies. *bioRxiv* 2025.09.29.679252.

Innovators

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