Assessment of maternal and fetal dolutegravir exposure by integrating ex vivo placental perfusion data and physiologically-based pharmacokinetic modeling

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About 1.4 million HIV-infected women give birth every year.

Mother-to-child transmission is linked to viral load.

Antiretroviral therapy reduces MTCT to <2%.

Optimal dosing in pregnancy is challenging!
Methods

✓ Pregnancy physiologically-based pharmacokinetic model (p-PBPK)
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✓ Perform ex vivo dual-side placental perfusion experiments
Simulations were able to capture maternal clinical pharmacokinetics
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Dolutegravir crosses the placenta *in vivo* and *ex vivo*.
Simulations were able to capture maternal clinical pharmacokinetics.

Dolutegravir crosses the placenta in vivo and ex vivo.

Predicted fetal $C_{24h} > EC90$ for viral inhibition $\rightarrow$ pre-exposure prophylaxis.
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