GLAD
UW Program on Targeted Long-acting Combination Antiretroviral Therapy (TLC-ART)

UNITIAID Grant 2020-39-GLAD

Ann Collier and Rodney JY Ho (PIs)
1 injection dose replaces 30-90 pills

Made possible by TLC’s Innovation in an enabling technology called **DcNP** or Drug Combination Nanoparticle Platform Technology

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**Target Product Profile**

<table>
<thead>
<tr>
<th>Target Population</th>
<th>Minimum</th>
<th>Optimal</th>
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</thead>
<tbody>
<tr>
<td>Route of Administration</td>
<td>Subcutaneous</td>
<td>Subcutaneous</td>
</tr>
<tr>
<td>Dose Volume</td>
<td>2 mL each site/injection</td>
<td>1 mL each site/injection</td>
</tr>
<tr>
<td>Number of Injections/dose</td>
<td>Two injections</td>
<td>One injection</td>
</tr>
<tr>
<td>Local Reaction (Incidence, severity)</td>
<td>Little or no local reaction</td>
<td>Little or no local reaction</td>
</tr>
</tbody>
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**Long Acting Pharmacokinetics (in primate after a bolus injection)**

- Dosing interval (chronic phase): given every 4 weeks
- Drug Stability (At 4°C or 25°C): 6 months cold storage

**Drug Combination Nano Particles (DcNP) Characteristics**

- HIV Targets: 2 HIV Targets, 3 HIV Targets
- Drug Stability (At 4°C or 25°C): 6 months cold storage, 6 months room temperature

**Antiviral Activity (In vitro)**

- Combination Vs Individual: ≥ 1 (more potent than single agent)
- Combination: Higher than individual drug potency
- Individual: Equivalent or higher than free drug potency

EC_{50} = 50% inhibitory effective concentration, μm = millimeter
LA-cART all-in-one dosing

• Innovations that enable all-in-one LA cART with DcNP

<table>
<thead>
<tr>
<th>Tenofovir</th>
<th>Lamivudine (3TC)</th>
<th>Dolutegravir</th>
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<tbody>
<tr>
<td>Love Water</td>
<td>Love Water</td>
<td>Not quite</td>
</tr>
</tbody>
</table>

Lipid excipients—serve as glue

Innovation in TLD solubilization and controlled SD to form stable DcNP powder

TLD powder product with unique Multi-drug Domain Matrices (MDM)

Suspend Size-reduction

TLD nano-size DcNP LA-Injectable dosage

TLC-ART Program-GLAD Project