Repurposing Metformin to Treat the “Other” Diabetes

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Diabetes

Diabetes Mellitus

Diabetes Insipidus
Nephrogenic Diabetes Insipidus (NDI)

• Rare Disease – US & EP ~71,000
• Causes – Genetic (10%) Acquired (90%)
  – Most acquired due to lithium toxicity
• Severely impacts quality of life
### Disease Management

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Challenge</th>
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<tbody>
<tr>
<td>• Discontinue lithium</td>
<td>• Removes effective therapy</td>
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<tr>
<td>• Prescribe diuretics</td>
<td>• Address symptoms, not underlying cause</td>
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<td>• Lifestyle changes</td>
<td>• Can’t be use with Li</td>
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<td>• IV fluids &amp; glucose if needed</td>
<td>• Requires monitoring</td>
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Currently there are no therapies for treating NDI.
What is Metformin?

- Oral anti-diabetes mellitus drug
  - ↓ liver glucose production & ↑ insulin sensitivity
- Widely prescribed 1st line therapy
  - 48M prescriptions annually in the US alone
- Approved by FDA in 1990’s & generically available as of 2010
- Relatively safe – low side effects
Does Metformin Work?

NDI mouse model = V₂R KO

Metformin treatment ↑ urine concentration and lowers volume in KO mice

Metformin restores the function & the ability to concentrate urine
Overview

Summary -
+ Orphan Indication with no therapy
+ Approved therapeutic with no known off-label use
+ Positive preliminary animal data

Next Steps – Creation of Li mouse model & reproduction of KO experiments

IP – Provisional patent, room to develop new formulations/dosing & improve opportunity

Future – looking for entrepreneur
Thank you