Intra-myocardial administration of JVS-100 promotes cardiac benefit and improves angiogenesis in a porcine model of heart failure

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Background

JVS-100 expresses functional SDF-1 protein and can induce dose-dependent activation of endogenous stem cells in injured tissue. It is mobilized/recruits hematopoetic stem cells to injured tissue and decreases myocardial ischemia.

Hypothesis:

Re-introducing SDF-1 expression in a chronically damaged heart using naked plasmid DNA gene transfer will increase cardiac function.

Results

JVS-100 improves cardiac function in pigs with heart failure

JVS-100 increases vessel density 30 days post-injection

Table 1. Study Design: JVS-100 Thrensay for Chronic Heart Failure in Pigs

<table>
<thead>
<tr>
<th>Group</th>
<th>Treatment</th>
<th>Heart Failure Design</th>
<th>JVS-100</th>
<th>Injection Procedure</th>
<th>Study Design</th>
<th>Heart Injection, n=4-6 per day</th>
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Figure 1. SDF-1 and CXC4 expression after an ischemic injury

Figure 2. SDF-1 ELISA and cMyc transwell migration assay

Figure 3. JVS-100 biodistribution in sections of the heart 90 days post-injection

Summary and Conclusions

Key safety and efficacy findings of the JVS-100 Heart Failure Study:

- JVS-100 protein, functional SDF-1 and cMyc plasmid can induce dose-dependent migration of CXC4+ stromal cells
- No low and mid dose JVS-100 increased LVEF and decreased LVESV 60 days post-injection in a pig model of chronic heart failure
- JVS-100 increased vessel density 30 days post-injection
- Increased cardiac function correlated with increased vessel density
- < 99.9999% of JVS-100 was cleared from the heart 90 days post-injection
- There were no JVS-100 related deaths during the study – the NOAEL is 100mg/kg
- These data demonstrate that JVS-100 is safe and effective in attenuating heart failure progression in a porcine model of ischemic cardiomyopathy.

Reference: