Prognostic Bio-markers for Cardiovascular Disease

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• **Problem** – No quick/inexpensive test to confirm presence and severity of coronary artery disease (CAD).

• **Opportunity** – Reduced levels of circulating progenitor cells (CPCs) have been associated with increased CAD severity and occurrence of major cardiac event and death.

• **Product** – Flow cytometry based diagnostic kit to quantitate circulating progenitor cell biomarkers.

• **Market** – Routine blood test that would be used during annual physical and checkups to monitor progress of cardiovascular risk factor modifications.
• Heart disease is the #1 killer in the US

• How do you know if you have CAD (or not)

• Risk Factors for CAD
  – Obesity, Stress, Blood Pressure, High Cholesterol

Current procedures are inadequate for routine testing of CAD!
CPC Subtype Biomarkers

- Emory Marker Panel
  - **CD45** is a transmembrane tyrosine phosphatase receptor that regulates cell growth and differentiation.
  - **CD34** cell surface glycoprotein that is involved in cell-cell adhesion.
  - **CD133** another cell surface glycoprotein with unknown function.
CPC Quantification

CPC Subtype Biomarkers

Label Antibody

Emory University Office of Technology Transfer

Graph showing data distribution
Coronary angiograms by visual estimation of <50% luminal narrowing in multiple segments of the coronary tree.

Association between cell counts and adverse events. Blue line describes a decreased survival probability in individuals that have low circulating biomarker levels.

Coronary Artery Disease Burden

CPC# per uL

Cumulative Survival
Technology Status

• 466 patient trial, pending publication
  – Examined CPC numbers
  – Patients followed for “major events”
  – Angiographic CAD presence and severity estimated

• Provisional patent application filed
  – 11/22/2011
## Opportunity Summary

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Costs</th>
<th>Repeatability</th>
<th>Convenience</th>
<th>Follow Up</th>
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<tbody>
<tr>
<td>Emory Marker Panel</td>
<td>Blood test</td>
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<td>Stress Test</td>
<td>Treadmill based exercise test</td>
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<tr>
<td>Calcium Imaging</td>
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<td>Angiography</td>
<td>Radiographic imaging</td>
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