GIFT4 – A Protein Therapy For Melanoma

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OTT Breakfast Club, May 21st, 2013

Gateway to Discovery, Innovation, and Products.
Melanoma

Melanoma – skin cancer of the melanocytes

- 160,000 cases & 64,000 deaths
- 64,000 cases & 9,000 deaths
- 75% of skin cancer deaths
- Growing – ↑ 3%

Epidemiology - Disproportionally impacts caucasians, esp. NW European descent & men

Risk Factors – UV light exposure, genetic mutations

Melanoma is a significant & growing problem
### Treatment & Survival

<table>
<thead>
<tr>
<th>Stage</th>
<th>Treatment</th>
<th>Survival</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early</td>
<td>I  Lesion removal, follow up</td>
<td>90-95%</td>
</tr>
<tr>
<td></td>
<td>II Lesion removal, follow up</td>
<td>50-80%</td>
</tr>
<tr>
<td>Mid</td>
<td>III Lesion removal, lymph node removal, follow up</td>
<td>24%-50%</td>
</tr>
<tr>
<td>Late</td>
<td>IV Lesion removal, lymph node removal, therapeutics, palliative care</td>
<td>7%-19%</td>
</tr>
</tbody>
</table>

- Average survival time for late stage = 10 months

Treating late stage melanoma remains a challenge
# Current Therapeutics

## Chemotherapies

<table>
<thead>
<tr>
<th>Product</th>
<th>Drawback</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zelboraf</td>
<td>😞 Only works on melanoma with mutation</td>
</tr>
<tr>
<td></td>
<td>😞 40% of cases resistant</td>
</tr>
<tr>
<td>Dacarbuzine</td>
<td>💩 High number of side effect</td>
</tr>
</tbody>
</table>

## Immunotherapies

<table>
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<th>Product</th>
<th>Drawback</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proleukin</td>
<td>😞 Low response rate (~ 15%)</td>
</tr>
<tr>
<td></td>
<td>😞 Highly toxic, must administer in hospital</td>
</tr>
<tr>
<td>Yervoy</td>
<td>😞 Life-threatening side effect (breathing)</td>
</tr>
</tbody>
</table>

Available therapies do not work well & have significant drawbacks
Technology

GM-CSF
⇢ granulocyte & monocyte production

GIFT4
GM-CSF & IL-4 fusion

IL-4
⇢ T cell proliferation
What does GIFT4 Do?

GIFT4 retains GM-CSF & IL-4 functions

**New function** – B-cell proliferation

Human B-cells cultured in human GIFT4

Displays a gain of function – B-cell expansion
Why are B-cells important?

• GIFT4 antitumor effect is B-cell dependent
GIFT4 as a therapy

GIFT4 treatment suppress tumor growth
IP & Development

IP Status - US provisional patent filed 10/23/2012

Current -
- Protein expressed in sufficient quantities
- Immune function confirmed *in vivo* & *in vitro*
- Melanoma model *in vivo* validation

Future – looking for entrepreneur
Thank you