Oncogene Mutations and Their Correlation with Serum Levels of Galectins -1, -3, and -9 in Breast Cancer Patients

Presented by
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**Introduction**

**Galectins** - members of the β-galactoside-binding protein family.

<table>
<thead>
<tr>
<th>Prototype</th>
<th>Chimeric</th>
<th>Tandem Repeat</th>
</tr>
</thead>
<tbody>
<tr>
<td>-1, -2, -5, -7, -10, -11, -13, -14, -15, -16</td>
<td>-3</td>
<td>-4, -6, -8, -9, -12</td>
</tr>
</tbody>
</table>

Galectins-1, -3, and -9 have been implicated in cancer progression, metastasis, and angiogenesis, as well as in modulating innate and adaptive immune responses.

Serum galectin levels, especially -3, rise dramatically in cancer patients.

Q: Are there correlations between oncogene mutations and patient characteristics, including galectin profiles?
Q: Are there correlations between oncogene mutations and patient characteristics, including galectin profiles?
Results

Q: Are there correlations between oncogene mutations and patient characteristics, including galectin profiles?

• A PIK3CA mutation is associated with high BMI.
• A JAK mutation is associated with very high BMI.
• A KIT mutation is more associated with Invasive Ductal Histology.
• A KIT mutation is associated with a higher number of mutations.

• Galectin-3 is elevated in brain tissue sites.
• Galectin-1 mildly increases with BMI.
• Galectins show no variation by stage.

• A KIT mutation is associated with higher Gal-3 and -9 serum levels.
• A PIK3CA mutation is associated with higher Gal-3 serum levels.
• An FLT3 mutation is associated with normal Gal-1 and -9 levels.
Results

<table>
<thead>
<tr>
<th>Galectin-1</th>
<th>Galectin-3</th>
<th>Galectin-9</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>35</strong></td>
<td><strong>80</strong></td>
<td><strong>20</strong></td>
</tr>
<tr>
<td><strong>30</strong></td>
<td><strong>60</strong></td>
<td><strong>10</strong></td>
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<tr>
<td><strong>20</strong></td>
<td><strong>40</strong></td>
<td><strong>5</strong></td>
</tr>
<tr>
<td><strong>10</strong></td>
<td><strong>20</strong></td>
<td><strong>0</strong></td>
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<tr>
<td><strong>5</strong></td>
<td><strong>0</strong></td>
<td><strong>0</strong></td>
</tr>
</tbody>
</table>

The diamonds represent galectin serum level means and 95% confidence intervals of healthy patients (green), breast cancer patients (red) or breast cancer patients with a mutation in the ATM (orange), FLT3 (purple), KIT (blue), or PIK3CA (pink) genes.

**Figure 1. Galectin Serum Levels of Breast Cancer Patients with Gene Mutations**

The diamonds represent galectin serum level means and 95% confidence intervals of healthy patients (green), breast cancer patients (red) or breast cancer patients with a mutation in the ATM (orange), FLT3 (purple), KIT (blue), or PIK3CA (pink) genes.
Conclusions

- Further investigation of the KIT gene and protein product and its interactions with galectins.
  - The p.Met541Leu mutation has been found to be associated with significant increases in galectin-3.
- Further investigation of the FLT3 gene and protein product and its interactions with galectins.
- Increase the scope by looking at liver and colon cancer patients.

Acknowledgments

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