Enhanced Oral Bioavailability of 3,3’-Dindolylmethane Administered in a Self-Microemulsifying Drug Delivery System (SMEDDS)

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ABSTRACT

3,3’-dindolylmethane (BR9001) is a stable, water-soluble isomer that demonstrates chemopreventive activity in several preclinical models but lacks oral bioavailability. Due to poor oral bioavailability, BR9001’s chemopreventive activity in human prostate cancer prevention models has not been studied. SMEDDS formulation technology was employed to improve the oral bioavailability of BR9001 in rats. The results of these studies are described below.

RATIONALIZE

SMEDDS are lipid-based formulations that are composed of oil, surfactant, and cosurfactant(s). When administered by oral gavage, SMEDDS formulation technology demonstrated improved oral bioavailability of BR9001 in rats.

BACKGROUND AND METHODS

Animal Welfare: Prior to the initiation of experimentation, the study protocol was reviewed and approved by the IIT Research Institute Animal Care and Use Committee. All work was performed in full compliance with Guidelines for the Care and Use of Laboratory Animals.

RESULTS

Table 1: Comparative Oral Bioavailability and PK of BR9001/9001 to BR9001

<table>
<thead>
<tr>
<th>Group</th>
<th>No. of Rats</th>
<th>Dose (mg/kg)</th>
<th>Oral Bioavailability</th>
<th>PK Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Cmax (ng/mL)</td>
</tr>
<tr>
<td>1</td>
<td>30</td>
<td>30</td>
<td>2.8 ± 0.5</td>
<td>1.8 ± 0.3</td>
</tr>
<tr>
<td>2</td>
<td>30</td>
<td>30</td>
<td>0.1 ± 0.0</td>
<td>0.0 ± 0.0</td>
</tr>
</tbody>
</table>

Conclusions

SMEDDS formulation technology demonstrated improved oral bioavailability of BR9001 in rats. The results of these studies are described above.

ACKNOWLEDGEMENT

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