
Sagar Narala  
*University of Mississippi*, snarala@go.olemiss.edu

Neeraja Komanduri  
*University of Mississippi*

Dinesh Nyavanandi  
*University of Mississippi*

Suresh Bandari  
*University of Mississippi*

Michael A. Repka  
*University of Mississippi*

Follow this and additional works at: [https://egrove.olemiss.edu/pharm_annual_posters](https://egrove.olemiss.edu/pharm_annual_posters)

Part of the Pharmacy and Pharmaceutical Sciences Commons

**Recommended Citation**

This Book is brought to you for free and open access by the Pharmacy, School of at eGrove. It has been accepted for inclusion in Annual Poster Session by an authorized administrator of eGrove. For more information, please contact egrove@olemiss.edu.
Solid Crystal Suspensions of Carbamazepine using Hot-melt Extrusion: A Solubility Enhancement Approach

Sagar Narala*, Neeraja Komanduri, Dinesh Nyavanandri, Suresh Bandari, Michael A. Repka
Department of Pharmaceutics and Drug Delivery, School of Pharmacy, The University of Mississippi, University, MS, 38677.
Contact information: snarala@go.olemiss.edu

PURPOSE
Solid crystal suspension (SCS) is an emerging technique for dissolution enhancement, in which the crystalline drug is suspended in crystalline excipient. Development of SCS of carbamazepine (CBM) with carriers mannitol and xylitol via a solvent free Hot-melt extrusion (HME) techniques to improve the dissolution.

OBJECTIVES
The main aim of current research is to investigate the development of solid crystal suspensions (SCS) of carbamazepine (CBM) to improve dissolution by Hot-melt extrusion (HME) techniques. The hydrophilic crystalline carriers xylitol (XYL) and mannitol (MAN) were investigated to assess the formation of SCSs.

RESULTS

<table>
<thead>
<tr>
<th>Formulation</th>
<th>CBM</th>
<th>MAN</th>
<th>XYL</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBM-MAN (10-90)</td>
<td>10</td>
<td>90</td>
<td>-</td>
</tr>
<tr>
<td>CBM-MAN (20-80)</td>
<td>20</td>
<td>80</td>
<td>-</td>
</tr>
<tr>
<td>CBM-XYL (10-90)</td>
<td>10</td>
<td>-</td>
<td>90</td>
</tr>
<tr>
<td>CBM-XYL (20-80)</td>
<td>20</td>
<td>-</td>
<td>80</td>
</tr>
</tbody>
</table>

Table 1. SCS formulations composition

CONCLUSION
CBM-MAN and CBM-XYL solid crystal suspensions were successfully prepared by hydrophilic carriers using HME. Studies revealed existence of formulations in crystalline form with no interactions. Furthermore, SCS was identified as a promising approach for enhancing solubility and dissolution of poorly soluble drugs.

ACKNOWLEDGEMENTS
This project was also partially supported by Grant Number P30GM122733-01A1, funded by the National Institute of General Medical Sciences (NIGMS) a component of the National Institutes of Health (NIH) as one of its Centers of Biomedical Research Excellence (COBRE).