## LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>Diagrammatic representation of the chain structure of proteins in the cystatin superfamily</td>
</tr>
<tr>
<td>1.1</td>
<td>Schematic illustration of evolutionary relationship of cystatins of type I, II and III</td>
</tr>
<tr>
<td>1.2</td>
<td>Three dimensional structure of type I and type II cystatins</td>
</tr>
<tr>
<td>1.3</td>
<td>Three dimensional structure of cystatin and cysteine proteinase complex</td>
</tr>
<tr>
<td>1.4</td>
<td>3D Structure of a typical type II cystatin and its secondary structure elements</td>
</tr>
<tr>
<td>1.5</td>
<td>Scheme of the proposed model for the interaction of chicken cystatin with papain</td>
</tr>
<tr>
<td>1.6</td>
<td>Structure of a mammalian brain</td>
</tr>
<tr>
<td>1.7</td>
<td>(a) The donors and physiological functions of nitric oxide</td>
</tr>
<tr>
<td></td>
<td>(b) Schematic diagram showing multiple biological activities of curcumin</td>
</tr>
<tr>
<td>1.8</td>
<td>Gel filtration chromatography on Sephadex G-100</td>
</tr>
<tr>
<td>1.9</td>
<td>Ion exchange chromatography on DEAE cellulose</td>
</tr>
<tr>
<td>2.0</td>
<td>Gel electrophoresis of HMGBC during various stages of purification</td>
</tr>
<tr>
<td>2.1</td>
<td>Gel electrophoresis of LMGBC during various stages of purification</td>
</tr>
<tr>
<td>2.2</td>
<td>SDS PAGE of the purified HMGBC and LMGBC under reducing and non reducing conditions</td>
</tr>
<tr>
<td>2.3</td>
<td>Molecular weight determination of the purified goat brain cystatins using Sephadex G-100 gel filtration chromatography</td>
</tr>
</tbody>
</table>
Figure 2.4 Molecular weight determination HMGBC by SDS PAGE

Figure 2.5 Molecular weight determination of LMGBC by SDS PAGE

Figure 2.6 Determination of Stoke's radii of the purified cystatins, HMGBC and LMGBC by Laurent and Killander plot.

Figure 2.7 Effect of pH on HMGBC and LMGBC

Figure 2.8 Effect of temperature on HMGBC and LMGBC

Figure 2.9 Thermal denaturation of HMGBC and LMGBC

Figure 3.0 Direct binding ELISA

Figure 3.1 Ouchterlony Immunodiffusion

Figure 3.2 Immunodiffusion of HMGBC with LMGBC and goat lung cystatin

Figure 3.3 Inhibitory activity of HMGBC and LMGBC with different proteinases

Figure 3.4 Determination of inhibition constant (Ki) with papain

Figure 3.5 Determination of inhibition constant (Ki) with ficin

Figure 3.6 Determination of inhibition constant (Ki) with bromelain

Figure 3.7 Determination of association rate constants ($K_{ass}$) for papain

Figure 3.8 Determination of association rate constants ($K_{ass}$) for ficin

Figure 3.9 Determination of association rate constants ($K_{ass}$) for bromelain

Figure 4.0 Determination of Dissociation rate constants ($K_{diss}$) for papain

Figure 4.1 Determination of Dissociation rate constants ($K_{diss}$) for ficin
Figure 4.2  Determination of Dissociation rate constants ($K_{diss}$) for bromelain

Figure 4.3  UV-absorption difference spectra measured for HMGBC and LMGBC

Figure 4.4  Fluorescence spectra of HMGBC in complex with papain

Figure 4.5  Fluorescence spectra of LMGBC in complex with papain

Figure 4.6  Far UV-CD spectra of HMGBC in complex with papain

Figure 4.7  Far UV-CD spectra of LMGBC in complex with papain

Figure 4.8  Near UV-CD spectra of HMGBC and LMGBC in complex with papain

Figure 4.9  Effect of varying time intervals of incubation photoactivated riboflavin and $H_2O_2$ on HMGBC antiproteolytic activity.

Figure 5.0  Effect of varying concentrations of riboflavin on HMGBC

Figure 5.1  Effect of varying concentrations of $H_2O_2$ on HMGBC

Figure 5.2  Effect of various scavengers and antioxidants on photoactivated riboflavin treated HMGBC

Figure 5.3  Effect of various scavengers and antioxidants on $H_2O_2$ treated HMGBC

Figure 5.4  Fluorescence spectra of HMGBC treated with photoilluminated riboflavin at varying concentration

Figure 5.5  Fluorescence spectra of HMGBC treated with $H_2O_2$ at varying concentration

Figure 5.6  Polyacrylamide gel electrophoresis of HMGBC in presence of nitric oxide generating chemicals for varying time intervals
Figure 5.7 Polyacrylamide gel electrophoresis of HMGBC in the presence of varying concentrations of curcumin

Figure 5.8 Intrinsic fluorescence spectra of HMGBC with NO in the presence and absence of curcumin

Figure 5.9 Extrinsic fluorescence spectra of HMGBC with NO in the presence and absence of curcumin

Figure 6.0 (A) Urea inactivation of HMGBC and LMGB and (B) Guanidine hydrochloride inactivation of HMGBC and LMGB

Figure 6.1 (A) Renaturation of Urea induced inactivated HMGBC and LMGB upon dilution and (B) Renaturation of GdnHCl induced inactivated HMGBC and LMGB upon dilution

Figure 6.2 (A) Intrinsic fluorescence analysis of HMGBC on interaction with various concentrations of urea and (B) Intrinsic fluorescence analysis of LMGB on interaction with various concentrations of urea

Figure 6.3 (A) Intrinsic fluorescence analysis of HMGBC on interaction with various concentrations of GdnHCl and (B) Intrinsic fluorescence analysis of LMGB on interaction with various concentrations of GdnHCl

Figure 6.4 (A) Extrinsic fluorescence analysis of HMGBC in the presence of urea and (B) Extrinsic fluorescence analysis of LMGB in the presence of urea

Figure 6.5 (A) Extrinsic fluorescence analysis of HMGBC in the presence of GdnHCl and (B) Extrinsic fluorescence analysis of LMGB in the presence of GdnHCl

Figure 6.6 (A) Secondary structure analysis of HMGBC in the presence of urea and (B) Secondary structure analysis of LMGB in the presence of urea
Figure 6.7  (A) Secondary structure analysis of HMGBC in the presence of GdnHCl  
(B) Secondary structure analysis of LMGBC in the presence of GdnHCl

Figure 6.8  Changes in the functional properties of HMGBC and LMGBC on high pH induced unfolding

Figure 6.9  Intrinsic fluorescence intensity of HMGBC and LMGBC at different pH values

Figure 7.0  Extrinsic fluorescence intensity of HMGBC and LMGBC at different pH values

Figure 7.1  CD measurements at 222nm of HMGBC and LMGBC at different pH values

Figure 7.2  Effect of increasing concentrations of salts on the recovery of inhibitory activity of high pH denatured HMGBC and LMGBC

Figure 7.3  Effect of increasing concentrations of salts on the intrinsic fluorescence intensity at 335nm of high pH denatured HMGBC and LMGBC

Figure 7.4  Effect of increasing concentrations of salts on the extrinsic fluorescence intensity at 480nm of high pH denatured HMGBC and LMGBC

Figure 7.5  Effect of salts on the intrinsic fluorescence of HMGBC

Figure 7.6  Effect of salts on the intrinsic fluorescence of LMGBC

Figure 7.7  Effect of salts on the extrinsic fluorescence of HMGBC

Figure 7.8  Effect of salts on the extrinsic fluorescence of LMGBC

Figure 7.9  Effect of addition of salts Na$_2$SO$_4$ and KCl on the far UV CD spectra of HMGBC

Figure 8.0  Effect of addition of salts Na$_2$SO$_4$ and KCl on the far UV CD spectra of LMGBC