

The release of hepatitis B core antigen from *Escherichia coli* by batch mode bead milling

ABSTRACT

The performance of a batch mode bead mill on the release of hepatitis B core antigen (HBcAg) from *Escherichia coli* was investigated in this study. The operating parameters examined were impeller tip speed (8–14 m/s), biomass concentration [5–20% (w/v)] and bead loading [65–80% (v/v)]. The highest yield (24.3 mg/g cell) and rate constant (0.471 1/min) of HBcAg release were achieved at impeller tip speed of 14 m/s. However, the high-shear stress under these operating conditions caused damage of the HBcAg. The highest yield (22.7 mg/g cell) and rate constant (0.344 1/min) of HBcAg release were observed at biomass concentration of 20% (w/v). There was no significant effect of bead loading on the performance of bead milling being observed. In conclusion, the optimal operating condition for the release of HBcAg was at bead loading of 75% (v/v), biomass concentration of 20% (w/v) and impeller tip speed of 10 m/s.

Keyword: Bead mill, Batch mode, Cell disruption, Hepatitis B core antigen, Downstream process, *Escherichia coli*