

CHEMICAL IDENTITY AND MECHANISMS OF ACTION AND FORMATION OF A CELL GROWTH INHIBITORY LEACHABLE COMPOUND FROM DISPOSABLE POLYCARBONATE PLASTIC VESSELS

Zara Melkounian, Corning Inc., USA
melkouniz@corning.com
Ye Fang, Corning Incorporated

Key Words: Leachables, mechanism of action, single-use polycarbonate vessels, CHO cells.

This presentation reports the chemical identity and mechanisms of action and formation of a single cell growth inhibitory leachable compound from disposable polycarbonate plastic vessels. 18 leachable compounds were separated and enriched from the total extracts of the vessels. Out of these compounds, only one displayed selective inhibition of the growth of a CHO cell line. High resolution MS and NMR suggested that the leachable compound is a dinitrophenol A. Chemical synthesis further confirmed that this leachable compound is one of the seven possible dinitrophenol A. Cell assays revealed that this leachable compound acted not only as a cell cycle arrest agent without any effect on cell viability, but also as a GPR35 agonist with moderate potency. Examining the manufacturing process of polycarbonate vessels showed that the formation of this leachable compound requires the combination of three critical process parameters, high temperature molding process, gamma-irradiation, and the presence of air. This study highlights that besides the resin materials the manufacturing process also contributes to the formation of cell growth inhibitory leachable compounds.