UNIVERSITAS
GADJAH MADA
Synthesis and cytotoxicity assay of chalcones from benzaldehydes and acetophenone derivatives as anticancer agent
KENTYARTO ISNANDI, Dr. Winarto Haryadi, M.Si; Dr. Tutik Dwi Wahyuningsih, M.Si.
Universitas Gadjah Mada, 2021 | Diunduh dari http://etd.repository.ugm.ac.id/

SYNTHESIS AND CYTOTOXICITY ASSAY OF CHALCONES FROM BENZALDEHYDE AND ACETOPHENONE DERIVATIVES AS ANTICANCER AGENTS

KENTDYARTO ISNANDI
16/396003/PA/17344

ABSTRACT

Synthesis and cytotoxicity assay of chalcones from benzaldehyde and acetophenone derivative as anticancer have been carried out. The first objective of this research was to study the synthesis of chalcone from benzaldehyde and acetophenone derivatives, i.e., 4-hydroxyacetophenone, 4-methoxyacetophenone, and 2,4-dimethoxyacetophenone, with sonochemistry method. The second objective was to determine the activity of chalcone compounds against breast cancer cell (4T1).

Synthesis of chalcone **A**, chalcone **B**, and chalcone **C** were performed using *Claisen-Schmidt* condensation reaction. The synthesis was conducted by reacting benzaldehyde to one of the acetophenone derivatives using ultrasonic irradiation for 3 hours at room temperature with the presence of catalysts. The synthesized products were characterized using GC-MS, FT-IR, ^{1}H-NMR, and ^{13}C-NMR spectrometers. For the cytotoxicity assay the products were tested by the MTT assays against 4T1 cancer cells.

Chalcones **A**, **B**, and **C** were successfully synthesized in 89.28, 89.07, and 87.96% yield, respectively. The anticancer activity for chalcone **A**, chalcone **B**, and chalcone **C** were tested against 4T1 cancer cells and gave IC_{50} values of 8.388, 13.021, and 5.607 μg/mL respectively. It can be concluded that chalcone **A**, **B**, and **C** were categorized have high activity toward breast cancer cell (4T1)

Keywords: chalcone, benzaldehyde, acetophenone, sonochemistry, anticancer