

# Sintesis Turunan Asam Amino dari Asam Risinoleat Minyak Jarak serta Uji Sitotoksitasnya pada Sel HeLa = Amino Acid Derivatives Synthesis from Risinoleic Acid Castor Oil And Its Cytotoxicity on HeLa Cell Line

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## Abstrak

Pada penelitian ini, asam risinoleat diesterifikasi dengan dry metanol dan katalis KOH dengan sistem reflux. Metil risinoleat yang terbentuk dioksidasi pada ikatan rangkapnya membentuk diol menggunakan  $\text{KMnO}_4$  encer dalam suasana basa pada suhu  $0^\circ\text{C}$ . Metil risinoleat kemudian diamidasi menggunakan asam amino glisin dan asam amino fenilalanin untuk menghasilkan senyawa lipoamida. Hasil karakterisasi lipoamida yang terbentuk menggunakan FTIR menunjukkan adanya pita serapan ulur N-H dan O-H yang overlapping pada bilangan gelombang  $3445,47\text{ cm}^{-1}$  untuk lipoamida glisin-risinoleat dan  $3434,06\text{ cm}^{-1}$  untuk lipoamida fenilalanin-risinoleat. Selain itu, muncul puncak serapan medium vibrasi C-N pada bilangan gelombang  $1217,90\text{ cm}^{-1}$  pada lipoamida glisin-risinoleat dan  $1217,59\text{ cm}^{-1}$  pada lipoamida fenilalanin-risinoleat. Hal ini menunjukkan ikatan amida yang terbentuk dari proses amidasi. Hasil uji sitotoksik MTT senyawa lipoamida terhadap sel HeLa menunjukkan bahwa nilai  $\text{IC}_{50}$  lipoamida glisin-risinoleat sebesar  $120\text{ }\mu\text{g/mL}$  yang termasuk ke dalam kategori cukup aktif, sedangkan  $\text{IC}_{50}$  lipoamida fenilalanin-risinoleat sebesar  $250\text{ }\mu\text{g/mL}$  yang tergolong memiliki sifat sitotoksitas yang lemah terhadap sel HeLa.

.....In this study, ricinoleic acid from castor oil was esterified with dry methanol and KOH catalyst using the reflux system. The methyl ricinoleate formed was oxidized on its double bonds to form a diol using dilute  $\text{KMnO}_4$  under alkaline conditions at  $0^\circ\text{C}$ . Methyl ricinoleate was then reacted through amidation process using amino acid glycine and amino acid phenylalanine to produce lipoamides. The results of characterization of lipoamides formed using FTIR showed that there were overlapping N-H and O-H stretch bands at wave numbers  $3445.47\text{ cm}^{-1}$  for glycine-ricinoleate lipoamide and  $3434.06\text{ cm}^{-1}$  for phenylalanine-ricinoleate lipoamide. In addition, the medium absorption peak of C-N appeared at the wave number  $1217.90\text{ cm}^{-1}$  for glycine-ricinoleate lipoamide and  $1217.59\text{ cm}^{-1}$  for phenylalanine-ricinoleate lipoamide. These showed that the amide bonds were formed from the amidation process. The results of the MTT cytotoxic assay of lipoamide compounds against HeLa cells showed that the  $\text{IC}_{50}$  value of glycine-ricinoleate lipoamide was  $120\text{ }\mu\text{g} / \text{mL}$  which was considered quite active, while the  $\text{IC}_{50}$  value of phenylalanine-ricinoleate lipoamide was  $250\text{ }\mu\text{g} / \text{mL}$  which was classified as having weak cytotoxicity properties against HeLa cells