ABSTRAK

KAJIAN POTENSI SENYAWA TURUNAN AMINOKALKON SEBAGAI INHIBITOR RESEPTOR FAKTOR PERTUMBUHAN EPIDERMAL SECARA *IN SILICO*

Rina Ayu Kartini[1], Muhamad Salman Fareza[2], Sarmoko[2]

Latar Belakang: Senyawa turunan aminokalkon dilaporkan memiliki aktivitas inhibitor reseptor faktor pertumbuhan epidermal (*Epidermal Growth Factor Receptor*, EGFR) tirosin kinase. Penelitian ini bertujuan untuk mengetahui senyawa turunan aminokalkon yang paling berpotensi sebagai inhibitor EGFR berdasarkan hasil penambatan molekuler dan aturan Lipinski, sehingga dapat menjadi dasar pengembangan obat baru.

Metodologi: Pendekatan *in silico* meliputi penambatan molekuler yang dilakukan dengan mengunduh struktur EGFR dari PDB, preparasi struktur protein menggunakan AutoDock Tools, penambatan kembali dengan ligan natif menggunakan AutoDock Vina, perhitungan RMSD menggunakan PyMOL, penambatan molekuler senyawa turunan aminokalkon, dan visualisasi hasil penambatan pada BIOVIA Discovery Studio. Selanjutnya uji aturan Lipinski dilakukan pada web SCFBio.

Hasil Penelitian: Energi ikatan (kkal/mol) senyawa 4'-amino-4-bromokalkon sebesar -8,6; senyawa 4'-amino-4-hidroksikalkon -8,4; senyawa 4'-amino-4-metilkalkon -8,7; senyawa 4'-amino-4-metoksikalkon -8,2; senyawa 4'-amino-4-nitrokalkon -8,3; senyawa 4'-aminokalkon -8,5; erlotinib -7,7; dan ligan natif -9,0. Senyawa uji, erlotinib, dan ligan natif memiliki ikatan hidrogen dengan asam amino Met793, interaksi hidrofobik dengan asam amino Leu844, Leu718, Val726, Ala743. Semua senyawa uji memenuhi syarat aturan Lipinski.

Kesimpulan: Senyawa 4'-amino-4-metilkalkon berpotensi sebagai inhibitor EGFR dan memiliki prediksi sifat fisikokimia yang baik.

Kata kunci: Turunan aminokalkon, EGFR, penambatan molekuler, Lipinski

[1]Mahasiswa Jurusan Farmasi FIKes Universitas Jenderal Soedirman
[2]Departemen Farmasi FIKes Universitas Jenderal Soedirman

ABSTRACT

STUDY IN SILICO OF THE POTENTIAL OF AMINOCHALCONE DERIVATES COMPOUNDS AS EPIDERMAL GROWTH FACTOR RECEPTOR INHIBITORS

Rina Ayu Kartini[1], Muhamad Salman Fareza[2], Sarmoko[2]

Background: Aminochalcone derivatives are reported to have epidermal growth factor receptor (EGFR) tyrosine kinase inhibitor activity. This study aims to determine which aminochalcone derivatives have the most potential to be developed as EGFR inhibitors based on the results of molecular docking and Lipinski's rules, so that they can become the basis for developing new drugs.

Methods: The in silico approach includes molecular docking which is carried out by downloading the EGFR structure from PDB, preparation of protein structures using AutoDock Tools, re-tethering with native ligands using AutoDock Vina, RMSD calculations using PyMOL, molecular docking of aminochalcone derived compounds, and visualization of tethering results at BIOVIA Discovery Studio. . Furthermore, the Lipinski's rules test was carried out on the SCFBio website.

Result: The binding energy (kcal/mol) of compound 4'-amino-4-bromochalcone is -8.6; compound 4'-amino-4-hydroxychalcone is -8.4; compound 4'-amino-4-methylchalcone is -8.7; compound 4'-amino-4-methoxychalcone is -8.2; compounds 4'-amino-4-nitrochalcone -8.3; compound 4'-aminochalcone -8.5; erlotinib -7.7; and the native ligand -9.0. The test compounds, erlotinib, and negative ligands have hydrogen bonds with the amino acid Met793, hydrophobic interactions with amino acids Leu844, Leu718, Val726, Ala743. All test compounds met the requirements of the Lipinski's rules.

Conclusion: The 4'-amino-4-methylchalcone compound has the potential as EGFR inhibitor and good predictions of physicochemical properties.

Keywordss: Aminochalcone derivatives, EGFR, molecular docking, Lipinski

[1]Student of Department of Pharmacy, Faculty of Health Sciences, Jenderal Soedirman University
[2]Department of Pharmacy, Faculty of Health Sciences, Jenderal Soedirman University