## ABSTRAK

Putra, Ridlo Ruditya. 2016. **Pengaruh Pemberian *Fucoidan* dari Alga Coklat (*Sargassum sp.*) Terhadap Gambaran Histopatologis pada Tikus Wistar (*Rattus norvegicus*) Model Stroke Iskemik**. Tugas Akhir, Program Studi Kedokteran, Fakultas Kedokteran Universitas Brawijaya. Pembimbing: (1) Dr. dr. Yuyun Yueniwati P. W., M. Kes., Sp. Rad(K) (2) dr. Badrul Munir Sp.S

Stroke iskemik merupakan penyakit kerusakan otak penyebab kecacatan fisik dan mental. Terapi stroke saat ini bersifat definitif, bukan rehabilitatif. MSC *(Mesenchymal Stem Cell)* dapat berdifferensiasi menjadi sel saraf. MSC sulit mobilisasi dari sumsum tulang menuju area kerusakan otak. *Fucoidan* dari *Sargassum sp.* berpotensi untuk terapi disabilitas pasca-stroke iskemik dengan cara meningkatkan mobilisasi MSC dan mencegah kematian sel otak. Fucoidan dapat meningkatkan ekspresi *Chemokine Co-Receptor-4 (CXCR-4)* di permukaan MSC. CXCR-4 berfungsi sebagai penangkap sinyal SDF-1 dari area kerusakan otak sehingga mobilisasi MSC menjadi lancar. Selain itu, fucoidan dapat memblok ikatan antara *Epidermal Growth Factor Receptor (EGFR)* dengan *Epidermal Growth Factor (EGF*) untuk menurunkan aktivasi *Activator Protein-1 (AP-1)* di otak sehingga kematian sel dapat dicegah. Penelitian ini adalah eksprimen murni dengan metode *Randomized Post-Test Only Controlled Group Design*. Tikus diinduksi stroke iskemik kemudian diterapi fucoidan (kelompok perlakuan). Hasil pengamatan histopatologi jaringan otak kelompok perlakuan menunjukkan penurunan jumlah sel *Gemitocyte Astrocyte.* Jadi, pemberian ekstrak *fucoidan* dapat meningkatkan fungsi otak pasca-stroke iskemik.



Kata kunci: fucoidan, mesenchymal stem cell, stroke iskemik.

## ABSTRACT

Putra, Ridlo Ruditya. 2016. **The Effect of Fucoidan Brown Algae (Sargassum sp.) Against Histopatologic in Wistar Rats (Rattus norvegicus) Ischemic Stroke Model**. Final Assignment, Medical Program, Faculty of Medicine, Brawijaya University. Supervisors: (1) Dr. dr. Yuyun Yueniwati P. W., M. Kes., Sp. Rad(K) (2) dr. Badrul Munir Sp.S

Ischemic Stroke is characterized by brain tissue damage that causes mental and physical disabilities. Stroke therapy is mostly definitive rather than rehabilitative. MSC (*Mesenchymal Stem Cell*) can differentiate into nerve cells. The mobilization of MSC from bone marrow towards brain damage area is difficult. Fucoidan in Sargassum sp. has strong potency as therapy agent repairing disabilities post ischemic stroke by improving mobilization of MSC and preventing nerve cells apoptosis. Fucoidan can increase the expression of *Chemokine Co-Receptor-4* (CXCR-4) in the surface of MSC. CXCR-4 functions as a signal catcher form brain damage area called SDF-1, so the mobilization of MSC becomes streamlined. Fucoidan is also proven to inhibit the bond between *Epidermal Growth Factor Receptor* (EGFR) and *Epidermal Growth Factor* (EGF) to decrease the activation of *Activator Protein-1* (AP-1) so that prevents nerve cells apoptosis. This research is a true experiment in *Randomized Post-Test Only Controlled Group Design*. It's using mouse as the animal ischemic stroke model and treated by using fucoidan (the treatment group). Histopathology of the brain tissues shows that the number of *Gemitocyte astrocyte* cell is decreased in the treatment group.The conclusion is the extract of fucoidan potentially increases the brain function after ischemic stroke.



Keywords: fucoidan, ischemic stroke, mesenchymal stem cell.