

## INTISARI

Asetilasi histon diatur oleh aktivitas salah satu enzim yaitu histon deasetilase (HDA). Keseimbangan antara asetilasi dan deasetilasi protein histon menentukan apakah suatu gen aktif atau nonaktif. Pemeriksaan dari sample post-mortem pasien *Alzheimer's disease* menunjukkan bahwa kelimpahan *HDA2* meningkat bahkan pada tahap awal patologi penyakit *Alzheimer's disease*. Penelitian ini bertujuan untuk melihat aksi kurkumin sebagai *brain disorder treatment agent* pada target gen histon deasetilase 2 (*HDA2*) dan melihat pengaruh kurkumin pada ekspresi gen terkait kemampuan belajar, fungsi memori dan kecemasan pada mencit yaitu gen *TrkB* dan gen *Htr1B*.

Senyawa kurkumin diformulasikan dalam bentuk *Self-Nanoemulsifying Drug Delivery System* (SNEDDS) untuk meningkatkan kelarutan dan bioavailabilitasnya dalam cairan biologis. Pemejanaan nanoemulsi senyawa kurkumin dosis 20mg/kgBB dan kurkumin dosis 40mg/kgBB diberikan untuk mengetahui pengaruhnya terhadap ekspresi gen histon deasetilase 2 (*HDA2*), gen *TrkB* dan gen *Htr1B*. Untuk menginduksi terjadinya *brain disorder*, mencit diberi etanol 10% v/v dalam pelarut CMC-Na 0,5% secara per oral selama 7 hari, selanjutnya dipejani senyawa kurkumin dalam dosis yang ditentukan selama 21 hari secara per oral. Gen *HDA2*, gen *TrkB* dan gen *Htr1B* dianalisis pada level DNA menggunakan metode Reverse Transcriptase-PCR dan visualisasi dengan gel elektroforesis.

Hasil penelitian ini menunjukkan bahwa nanoemulsi kurkumin dosis 20mg/kgBB dan kurkumin dosis 40mg/kgBB dapat menghambat ekspresi gen *HDA2*, meningkatkan ekspresi gen *TrkB* secara signifikan, dan menurunkan ekspresi gen *Htr1B*. Penghambatan ekspresi gen *HDA2* oleh nanoemulsi kurkumin dosis 20mg/kgBB dan kurkumin dosis 40mg/kgBB meningkatkan ekspresi gen *TrkB*.

**Kata Kunci:** Kurkumin, ekspresi gen, histon deasetilase 2, *TrkB*, *Htr1B*, *brain disorder*

## ABSTRACT

Histone acetylation is regulated by the activity of one of the enzymes, histone deacetylase (HDA). The balance between acetylation and deacetylation of histone proteins determines whether a gene is active or inactive. Examination of post-mortem samples of Alzheimer's disease patients shows that the abundance of HDA2 increases even in the early stages of Alzheimer's disease. This study aims to look at the action of curcumin as a brain disorder treatment agent on the target of histone deacetylase 2 (HDA2) gene and see the effect of curcumin on gene expression related to learning ability, memory function and anxiety in mice namely *TrkB* gene and *Htr1B* gene.

Curcumin compounds are formulated in the form of Self-Nanoemulsifying Drug Delivery System (SNEDDS) to improve solubility and bioavailability in biological fluids. The arrangement of curcumin compound nanoemulsion doses of 20mg / kgBB and 40mg / kgBB curcumin was given to determine its effect on the expression of histone deacetylase 2 (HDA2) gene, *TrkB* gene and *Htr1B* gene. To induce brain disorder, mice were given ethanol 10% v / v in CMC-Na 0.5% solvent orally for 7 days, then cured the curcumin compound in the prescribed dose for 21 days orally. The HDA2 gene, *TrkB* gene and *Htr1B* gene are analyzed at the DNA level using the Reverse Transcriptase-PCR method and visualization with gel electrophoresis.

The results of this study indicate that nanoemulsion curcumin at a dose of 20mg / kgBB and a curcumin dose of 40mg / kgBB can inhibit HDA2 gene expression, significantly increase *TrkB* gene expression, and decrease *Htr1B* gene expression. The inhibition of HDA2 gene expression by nanoemulsion curcumin in a dose of 20mg / kgBB and a curcumin dose of 40mg / kgBB increased the expression of *TrkB* gene.

**Keywords:** Curcumin, gene expression, histone deacetylase 2, *TrkB*, *Htr1B*, brain disorder