

INTISARI

Pada saat ini, banyak penyakit muncul yang disebabkan oleh adanya perubahan epigenom di dalam transkripsi sel, seperti proses asetilasi dan deasetilasi yang menyebabkan perubahan ekspresi gen melalui modifikasi protein histon. Histon deasetilasi yang dikatalis oleh enzim histon deasetilase (HDA) merupakan proses penarikan gugus asetil dari protein histon DNA tidak dapat dijangkau oleh faktor-faktor transkripsi sehingga terjadi penurunan ekspresi gen. Oleh karena itu, pengobatan yang bertarget pada HDA sangat diperlukan untuk mengobati berbagai penyakit yang berkaitan dengan modifikasi epigenom khususnya deasetilasi histon. Penelitian ini bertujuan untuk mengetahui kemampuan *dietary compounds* dalam menghambat enzim HDA 2 dan HDA 8. *Dietary compounds* merupakan zat aktif dalam makanan yang hampir setiap hari dikonsumsi yang dapat mempengaruhi asetilasi dan deasetilasi sehingga *dietary compounds* mampu dijadikan suatu strategi baru untuk mencegah, menunda, atau menyembuhkan beberapa penyakit dengan menghambat aktivitas HDA.

Penelitian ini dilakukan secara *in vitro* menggunakan metode spektrofotometri dengan mengukur intensitas fluoresensi. Uji ini dilakukan untuk mengetahui kemampuan *dietary compounds*, seperti genistein, daidzein, kurkumin, alil sulfida, benzil isotiosianat (BITC), dan metil piruvat dalam menghambat enzim HDA 2 dan HDA 8.

Rata-rata efek penghambatan genistein 100 μM terhadap enzim HDA 2 sebesar 52,71%. Rata-rata efek penghambatan daidzein 75 μM terhadap enzim HDA 2 sebesar 58,25%. Rata-rata efek penghambatan kurkumin 115 μM terhadap enzim HDA 2 51,52%. Rata-rata efek penghambatan BITC 150 μM terhadap enzim HDA 2 sebesar 62,48%; sedangkan rata-rata efek penghambatan BITC 5 μM terhadap enzim HDA 8 sebesar 54,08%. Rata-rata efek penghambatan alil sulfida 100 μM terhadap enzim HDA 2 sebesar 53,86%; sedangkan rata-rata efek penghambatan alil sulfida 100 μM terhadap enzim HDA 8 sebesar 59,11%. *Dietary compounds* seperti genistein, daidzein, kurkumin, BITC, dan alil sulfida mampu memberikan efek penghambatan terhadap enzim HDA 2 dan HDA 8.

Kata kunci: *dietary compounds*, HDA, dan efek penghambatan.

ABSTRACT

At this time, many emerging diseases that are caused by changes in the transcription epigenom cells, such as acetylation and deacetylation is causing changes in gene expression through modification of histone proteins. Histone deacetylation is catalyzed by the histone deacetylase (HDA) enzyme is the process of withdrawal of acetyl groups from the histone protein inaccessible to transcription factors resulting in a decrease in gene expression. Therefore, treatment is targeted at the HDA is needed to treat a variety of diseases related to the epigenom modification in particular histone deacetylation. This study aims to determine the ability of dietary compounds to inhibit the HDA 2 and HDA 8 enzyme. Dietary compounds are active substances in foods consumed almost every day that can affect acetylation and deacetylation so that dietary compounds able to be used as a new strategy to prevent, delay, or heal some diseases by inhibiting the activity of HDA.

This study was performed in vitro using methods spektrofotometri by measuring the fluorescence intensity. This test is performed to determine the ability of dietary compounds, such as genistein, daidzein, curcumin, allyl sulfide, benzyl isothiocyanate (BITC), and methyl pyruvate in inhibiting HDA 2 and HDA 8 enzyme.

An average of 100 μ M genistein inhibitory effect on the HDA 2 enzyme amounted to 52.71%. An average of 75 μ M daidzein inhibitory effect on the HDA 2 amounted to 58.25%. An average of 115 μ M curcumin inhibitory effect on the HDA 2 enzyme 51.52%. An average of 150 μ M BITC inhibitory effect on the HDA 2 enzyme amounted to 62.48%; while the average inhibitory effect on the BITC 5 μ M HDA 8 enzyme amounted to 54.08%. On average the inhibitory effects of 100 μ M allyl sulfides of the HDA 2 enzyme amounted to 53.86%; while the average of 100 μ M allyl sulfides inhibitory effect of the HDA 8 enzyme amounted to 59.11%. Dietary compounds such as genistein, daidzein, curcumin, BITC, and allyl sulfides capable of delivering inhibitory effect on the HDA 2 and HDA 8 enzyme.

Keywords: dietary compounds, HDA, and the inhibitory effect