

Ekspresi dan regulasi Gen CD52 pada epididimis mencit (*Mus musculus*): studi pendahuluan perannya dalam proses pematangan sperma = Expression and regulation of CD52 in the mouse epididymis *mus musculus* a preliminary study of its role in sperm maturation process / Silvani Permatasari

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Abstrak

[ABSTRAK

Latar belakang: Proses pematangan sperma terjadi melalui interaksi spermatozoa dengan protein yang disekresikan ke lumen oleh sel epitel epididimis. Sekresi protein pada epididimis ditentukan oleh gen-gen yang terekspresi spesifik di epididimis. Ekspresi gen di epididimis dapat dipengaruhi oleh androgen atau faktor testikular. CD52 telah diketahui terekspresi di epididimis, namun regulasi yang mempengaruhi ekspresi gen CD52 di epididimis belum diketahui. Tujuan dari penelitian ini adalah untuk menganalisis ekspresi dan regulasi gen CD52 agar dapat memprediksi perannya di epididimis mencit. Metode: Analisis bioinformatika dilakukan untuk memprediksi sinyal peptida dan domain fungsional dari CD52. Quantitative real time RT-PCR digunakan untuk mengukur ekspresi relatif gen CD52 pada analisis spesifisitas jaringan, ketergantungan terhadap androgen dan faktor testikular, serta postnatal development. Hasil: CD52 memiliki sinyal peptida yang menunjukkan ciri protein sekretori dan terekspresi secara spesifik di epididimis. Ekspresi CD52 yang tertinggi terdapat di bagian cauda. Ekspresi CD52 pada mencit diregulasi oleh androgen yang ditandai dengan penurunan pada hari pertama dan ketiga setelah digonadektomi dan pemberian testosteron eksogen setelah gonadektomi dapat menjaga ekspresi CD52 50% dari kadar normalnya. Eksperimen dengan memberikan reseptor androgen antagonis (flutamide) juga mendukung bahwa ekspresi CD52 sangat tergantung terhadap androgen. Ekspresi CD52 menurun sangat bermakna hingga mencapai 93% dibandingkan dengan kontrol. Selain androgen, ekspresi CD52 juga dipengaruhi oleh faktor testikular. Ekspresi CD52 mengalami penurunan bermakna dari hari pertama hingga kelima setelah perlakuan efferent duct ligation (EDL) hingga mencapai 75% dari kontrol. Selain itu ekspresi CD52 juga dipengaruhi oleh perkembangan pasca lahir. Ekspresi CD52 meningkat di hari ke-15 hingga hari ke-60 pasca lahir. Kesimpulan: CD52 merupakan gen penyandi protein sekretori yang terekspresi spesifik di epididimis pada region cauda dan regulasinya dipengaruhi oleh androgen, faktor testikular, dan perkembangan pasca lahir.

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ABSTRACT

Background. Epididymal sperm maturation is occurs via interactions between sperm and proteins secreted by epididymal epithelium. These proteins are encoded by genes that are specifically expressed in a region-specific manner. Previous studies have demonstrated that epididymal genes are regulated by androgen and testicular factors. CD52 is an epididymal gene putatively involved in sperm maturation. However, the regulation of its expression in the epididymis has not been fully understood and little is known about its role during sperm maturation process. Therefore, this study was aimed to analyze the expression and regulation of CD52 in the mouse epididymis. Method. Bioinfomatic analyses were perfomed to predict signal peptides

and functional domains of CD52. Quantitative real-time RT-PCR was used to analyze tissue distribution, androgen, testicular factors dependency and postnatal development. Results. CD52 amino acid sequence contains a signal peptide, indicating it is a secretory protein. CD52 exhibited region-specific expression in the epididymis with the highest level was in cauda. Mice CD52 expression was regulated by androgen indicated by a decrease started at day 1 following a gonadectomy. Interestingly, testosterone replacement therapy was able to maintain the expression at 50% of normal level. Experiment by given androgen receptor antagonist, flutamide showed decrease of CD52 expression about 93% than control. It's confirming that CD52 expression depend on androgen. Moreover, testicular factors also influenced CD52 expression. This was revealed by efferent duct ligation in which CD52 expression was reduced at day 1 to day 5 following the ligation. Finally, CD52 expression was developmentally regulated, this was indicated by increase in the level of expression start at day 15 postnatally. Conclusion: CD52 is a secretory protein and exhibited region-specific expression in the cauda epididymis. It is regulated by androgen, testicular factors, and also affected by development stage.

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