UJI AKTIVITAS ANTIBAKTERI SEDIAAN KRIM YANG MENGANDUNG *SECRETOME MESENCHYMAL STEM CELL* TERHADAP BAKTERI JERAWAT

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ABSTRAK

UJI AKTIVITAS ANTIBAKTERI SEDIAAN KRIM YANG MENGANDUNG *SECRETOME MESENCHYMAL STEM CELL* TERHADAP BAKTERI JERAWAT

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Pengembangan produk biofarmasi berbasis *secretome mesenchymal stem cell (MSC)* dalam bidang kosmetika semakin berkembang sebagai pendekatan inovatif dalam formulasi sediaan yang menawarkan berbagai manfaat, khususnya dalam pengobatan jerawat. *Secretome* MSC telah dilaporkan memiliki aktivitas antibakteri yang ditandai dengan adanya peptida antimikroba HCAP-18 yang diaktivasi menjadi LL-37 sehingga menunjukkan potensi sebagai alternatif terapi jerawat. Penelitian ini bertujuan untuk mengevaluasi aktivitas antibakteri sediaan krim yang mengandung *secretome* MSC terhadap bakteri patogen penyebab jerawat yaitu *Propionibacterium acnes* ATCC 11827 dan *Staphylococcus aureus* ATCC 29213 serta menganalisis pengaruh perbedaan konsentrasinya. Krim *secretome* MSC diformulasikan pada konsentrasi 3%, 5%, 7% dan 10% kemudian diuji aktivitas antibakterinya menggunakan metode *agar well diffusion.* Hasil penelitian menunjukkan bahwa krim *secretome* MSC 3%, 5%, 7%, 10% serta kontrol positif dan negatif, menghasilkan daya hambatan yang kuat hingga sangat kuat, dengan peningkatan zona hambat sebanding dengan kenaikan konsentrasi. Rata-rata diameter zona hambat yang diamati terhadap bakteri *P. acnes* ATCC 11827 sebesar 18,66 mm, 21,25 mm, 22,11 mm, 23,53 mm, 17,32 mm dan 17,03 mm, sedangkan terhadap bakteri *S. aureus* ATCC 29213 sebesar 17,29 mm, 19,82 mm, 22,19 mm, 23,63 mm, 18,93 mm dan 14,25 mm. Analisis statistik menggunakan uji *One-Way* ANOVA dan uji *Post Hoc Test Games-Howell* menunjukkan adanya perbedaan yang signifikan, dengan pengaruh bermakna terhadap aktivitas antibakteri pada perbandingan konsentrasi 3% terhadap 7% dan 10%.

Kata kunci: aktivitas antibakteri, krim sekretom MSC, jerawat, *P. acnes*, *S. aureus*

ABSTRACK

EVALUATION OF THE ANTIBACTERIAL ACTIVITY OF A CREAM CONTAINING MESENCHYMAL STEM CELL SECRETOME AGAINST ACNE-CAUSING BACTERIA

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The development of biopharmaceutical products based on mesenchymal stem cell (MSC) secretome in the field of cosmetics has been advancing as an innovative approach to formulating preparations that offer various benefits, particularly in acne treatment. MSC secretome has been reported to exhibit antibacterial activity, characterized by the presence of the antimicrobial peptide HCAP-18, which is activated into LL-37 and potential as an alternative acne therapy. This study aims to evaluate the antibacterial activity of a cream formulation containing MSC secretome against acne-causing pathogenic bacteria, namely *Propionibacterium acnes* ATCC 11827 and *Staphylococcus aureus* ATCC 29213, and to analyze the effect of different concentrations. MSC secretome cream was formulated at concentrations 3%, 5%, 7%, and 10%, and its antibacterial activity was assessed using the agar well diffusion method. The result demonstrated that MSC secretome cream at concentrations of 3%, 5%, 7%, and 10%, as well as the positive control, exhibited strong to very strong inhibitory effects, with inhibition zone increasing proportionally with concentrations. The average inhibition zones diameters observed for *P. acnes* ATCC 11827 were 18,66 mm, 21,25 mm, 22,11 mm, 23,53 mm, 17,32 mm and 17,03 mm, respectively. While for *S. aureus* ATCC 29213, the zones measured 17,29 mm, 19,82 mm, 22,19 mm, 23,63 mm, 18,93 mm and 14,25 mm, respectively. Statistical analysis using *One-Way ANOVA* and *Games-Howell* Post Hoc Test indicated significant differences, with a meaningful effect on antibacterial activity observed when comparing the 3% concentrations to the 7% and 10% concentrations.

Keywords: antibacterial activity, MSC secretome cream, acne, *P. acnes, S. aureus*