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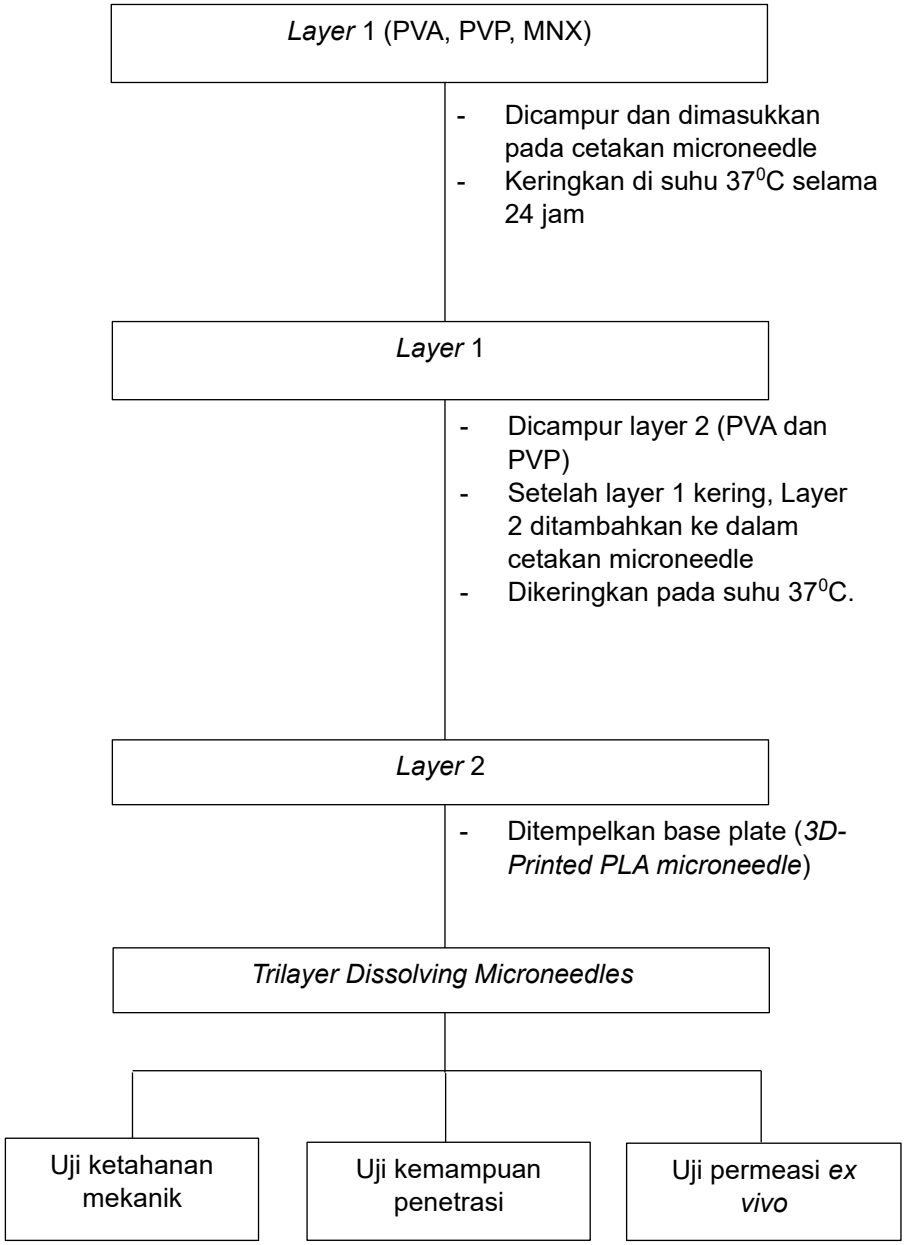
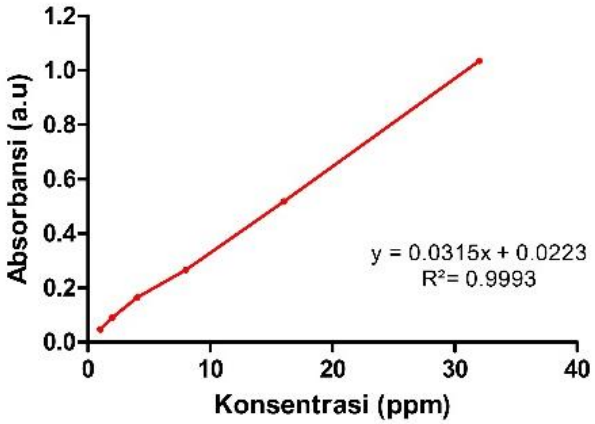
LAMPIRAN

Lampiran 1. Skema kerja



Lampiran 2. Kurva Baku



Gambar 15. Kurva baku MNX dalam PBS

Tabel 3. Data absorbansi kurva baku MNX dalam PBS

Konsentrasi	Absorbansi (a.u)				
(bpj)	Replikasi 1	Replikasi 2	Replikasi 3	Rata-rata	SD
32	1,146	0,926	1,031	1,034	0,110
16	0,573	0,465	0,511	0,516	0,054
8	0,300	0,226	0,270	0,265	0,037
4	0,154	0,166	0,170	0,163	0,008
2	0,073	0,106	0,093	0,091	0,016
1	0,034	0,048	0,058	0,046	0,012

Lampiran 3. Perhitungan Data dan Tabel Data %Reduksi

Lampiran 3.1 Perhitungan %Reduksi

Untuk TDMN2 replikasi pertama, tinggi jarum sebelum kompresi adalah 701 µm dengan tinggi jarum setelah kompresi adalah 663 µm.

$$\%\text{Reduksi} = \frac{\text{Tinggi jarum sebelum kompresi - Tinggi jarum setelah kompresi}}{\text{Tinggi jarum sebelum kompresi}} \times 100$$

$$\%\text{Reduksi} = \frac{701 - 663}{701} \times 100$$

$$\%\text{Reduksi} = \frac{38}{701} \times 100$$

$$\%\text{Reduksi} = 5{,}42\%$$

Lampiran 3.2 Tabel data %Reduksi

Tabel 5. Data hasil uji kekuatan mekanik TDMN

Formula	Tinggi TDMN sebelum kompresi (µm)	Tinggi TDMN setelah kompresi (µm)	%Reduksi	Rata-rata	SD
TDMN1	703	529	24,75	24,74	1,63
	697	536	24,1		
	698	514	26,36		
TDMN2	701	663	5,42	5,86	2,66
	700	639	8,71		
	697	673	3,44		
TDMN3	700	676	3,43	6,26	2,67
	695	649	6,62		
	698	637	8,74		
TDMN4	703	609	13,37	12,03	1,17
	697	619	11,19		
	702	621	11,54		
TDMN5	698	508	27,22	28,64	1,3
	702	499	28,92		
	702	493	29,77		

Lampiran 4. Perhitungan Data dan Tabel Data %Penetrasi

Lampiran 4.1 Perhitungan %Penetrasi

Untuk TDMN2 lapisan ke-4 replikasi pertama, jumlah lubang yang terbentuk adalah 87 dengan jumlah jarum pada TDMNs sebanyak 100.

$$\%\text{Penetrasi} = \frac{\text{Jumlah lubang yang terbentuk}}{\text{Jumlah } \textit{array} \text{ pada TDMN}} \times 100$$

$$\%\text{Penetrasi} = \frac{87}{100} \times 100$$

$$\%\text{Penetrasi} = 87\%$$

Lampiran 4.2 Tabel uji kemampuan penetrasi

Tabel 6. Data hasil uji kemampuan penetrasi TDMN

Lapisan ke-	Jumlah lubang yang terbentuk														
	TDMN1			TDMN2			TDMN3			TDMN4			TDMN5		
1	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
2	81	68	49	100	100	100	100	100	100	67	75	88	75	71	81
3	31	38	26	100	98	89	71	59	66	61	70	63	24	31	32
4	0	0	0	87	81	83	17	23	22	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Lampiran 5. Perhitungan Data dan Tabel Data Permeasi *Ex Vivo*

Lampiran 5.1 Perhitungan persentase permeasi *ex vivo*

Untuk TDMN2 jam ke-0,5 replikasi pertama diperoleh absorbansi 0,051 dengan persamaan regresi y = 0,0315x + 0,0223 dan faktor dilusi = 1

$y = 0{,}0315x + 0{,}0223$

$x = \frac{y - 0{,}0223}{0{,}0315}$

$x = \frac{0{,}051 - 0{,}0223}{0{,}0315}$

$x = \frac{0{,}0287}{0{,}0315} = 0{,}91$ µg/mL

Konsentrasi dalam 28 mL = 0,91 µg/mL x 28 x 1 = 25,48 µg/mL

Faktor koreksi = $\frac{\text{Konsentrasi jam sebelumnya}}{1000}$ + faktor koreksi jam sebelumnya

Faktor koreksi = $\frac{0}{1000} + 0$

Faktor koreksi = 0

Jumlah obat yang terpermeasi = Konsentrasi dalam 28 mL + Faktor koreksi

Jumlah obat yang terpermeasi = 25,48 µg + 0

Jumlah obat yang terpermeasi = 25,48 µg

Lampiran 5.2 Tabel uji permeasi *ex vivo*

Tabel 7. Data hasil uji permeasi TDMN2

Waktu (jam)	Absorbansi	Konsentrasi (µg/mL)	Faktor pengenceran	Dalam 28 mL (µg)	Faktor koreksi	Minoxidil yang terpermeasi (mg)	Rata-rata (mg)	SD
0,5	0,051	0,91	1	25,48	0,00	25,48	21,62	3,39
	0,045	0,72	1	20,21	0,00	20,21		
	0,044	0,68	1	19,16	0,00	19,16		
1	0,052	0,95	1	26,53	0,00	26,53	33,21	5,8
	0,063	1,29	1	36,02	0,00	36,02		
	0,064	1,32	1	37,07	0,00	37,07		
2	0,094	2,26	1	63,41	0,00	63,41	55,33	7,91
	0,076	1,70	1	47,60	0,00	47,61		
	0,084	1,96	1	54,98	0,00	54,98		
3	0,105	2,64	1	73,94	0,00	73,95	71,84	7,6
	0,094	2,26	1	63,41	0,00	63,41		
	0,110	2,79	1	78,16	0,00	78,16		
4	0,116	2,98	1	83,42	0,01	83,43	82,03	7,47
	0,122	3,17	1	88,69	0,01	88,70		
	0,105	2,64	1	73,94	0,01	73,95		

Lanjutan Tabel 7

Waktu (jam)	Absorbansi	Konsentrasi (µg/mL)	Faktor pengenceran	Dalam 13 mL (mg)	Faktor koreksi	Minoxidil yang terpermeasi (mg)	Rata-rata (mg)	SD
5	0,141	3,77	1	105,55	0,01	105,56	106,89	11,75
	0,156	4,26	1	119,25	0,01	119,25		
	0,130	3,42	1	95,86	0,01	95,87		
6	0,183	5,09	1	142,42	0,01	142,44	123,82	16,8
	0,146	3,92	1	109,76	0,01	109,78		
	0,156	4,26	1	119,25	0,01	119,26		
7	0,200	5,64	1	157,93	0,02	157,95	154,75	6,62
	0,188	5,25	1	147,12	0,02	147,14		
	0,201	5,68	1	159,13	0,02	159,15		
8	0,215	6,11	1	171,14	0,02	171,17	169,56	21,66
	0,188	5,25	1	147,12	0,02	147,14		
	0,236	6,80	1	190,36	0,02	190,38		

Tabel 8. Data hasil uji permeasi krim minoxidil

Waktu (jam)	Absorbansi	Konsentrasi (µg/mL)	Faktor pengenceran	Dalam 13 mL (mg)	Faktor koreksi	Minoxidil yang terpermeasi (mg)	Rata-rata (mg)	SD
0,5	0,028	0,18	1	5,07	0,00	5,07	4,18	2,35
	0,024	0,05	1	1,51	0,00	1,51		
	0,029	0,21	1	5,96	0,00	5,96		
1	0,029	0,21	1	5,93	0,00	5,93	5,74	2,64
	0,032	0,30	1	8,27	0,00	8,27		
	0,026	0,11	1	3,01	0,00	3,01		
2	0,036	0,42	1	11,79	0,00	11,79	12,96	2,55
	0,040	0,57	1	15,88	0,00	15,88		
	0,035	0,40	1	11,20	0,00	11,20		
3	0,057	1,11	1	31,10	0,00	31,10	28,18	2,68
	0,051	0,92	1	25,83	0,00	25,83		
	0,053	0,99	1	27,59	0,00	27,59		
4	0,060	1,19	1	33,44	0,00	33,45	35,01	4,31
	0,067	1,42	1	39,88	0,00	39,88		
	0,058	1,13	1	31,69	0,00	31,69		
5	0,060	1,19	1	33,44	0,00	33,45	38,32	9,48
	0,059	1,15	1	32,27	0,00	32,28		
	0,078	1,76	1	49,25	0,00	49,25		

Lanjutan Tabel 8

Waktu (jam)	Absorbansi	Konsentrasi (µg/mL)	Faktor pengenceran	Dalam 13 mL (mg)	Faktor koreksi	Minoxidil yang terpermeasi (mg)	Rata-rata (mg)	SD
	0,082	1,88	1	52,76	0,00	52,76		
6	0,067	1,40	1	39,30	0,00	39,30	42,03	9,66
	0,061	1,22	1	34,03	0,00	34,03		
	0,078	1,76	1	49,25	0,01	49,25		
7	0,072	1,57	1	43,98	0,01	43,99	47,69	3,22
	0,078	1,78	1	49,83	0,01	49,84		
	0,068	1,45	1	40,47	0,01	40,48		
8	0,087	2,05	1	57,44	0,01	57,45	51,21	9,33
	0,085	1,99	1	55,69	0,01	55,69		

Lampiran 6. Perhitungan Data dan Tabel Data Fluks

Lampiran 6.1 Perhitungan fluks

Untuk TDMN2 jam ke-8 replikasi pertama, konsentrasi obat adalah 6,11 µg/mL, faktor dilusi = 1, volume kompartemen reseptor = 28 mL, dan luas area membran difusi adalah 1,6 cm^2

$$\text{Permeat} = \frac{\text{Konsentrasi obat pada jam ke-n} \times \text{faktor dilusi} \times \text{volume kompartemen reseptor}}{\text{Luas area membran difusi}}$$

$$\text{Permeat} = \frac{6{,}11\ \mu g/mL \times 1 \times 28\ mL}{1{,}6\ cm^2}$$

$$\text{Permeat} = 106{,}98\ \mu g/cm^2$$

Untuk permeat kumulatif, dilakukan penjumlahan dari permeat dari jam-jam sebelumnya hingga diperoleh nilai permeat kumulatif pada jam ke-8 replikasi pertama = 531,2 µg/cm^2

$$\text{Fluks} = \frac{\text{Permeat kumulatif pada jam ke-n}}{\text{Waktu (jam)}}$$

$$\text{Fluks} = \frac{531{,}2\ \mu g/cm^2}{8\ \text{jam}}$$

$$\text{Fluks} = 66{,}39\ \mu g/cm^2.\text{jam}$$

Lampiran 6.2 Tabel data fluks

Tabel 10. Data fluks permeasi *ex vivo* pada jam ke-24

Formula	Permeat (µg/cm^2)	Rata-rata	SD	Permeat kumulatif (µg /cm^2)	Rata-rata	SD	Fluks (µg /cm^2.jam)	Rata-rata	SD
TDMN2	106,98	105,98	13,54	531,2	511,91	22,6	66,4	63,99	2,83
	91,97			487,04			60,88		
	118,99			517,49			64,69		
Krim MNX	25,3	32	5,83	164,55	165,82	1,63	20,57	20,73	0,2
	35,91			165,25			20,66		
	34,81			167,66			20,96		

Lampiran 7. Hasil Uji Statistik Menggunakan *Software* IBM SPSS

Uji kekuatan mekanik

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Formula	Statistic	df	Sig.	Statistic	df	Sig.
Reduction	F1	.176	3	.	1.000	3	.986
	F2	.232	3	.	.980	3	.727
	F3	.220	3	.	.987	3	.779
	F4	.330	3	.	.866	3	.284
	F5	.252	3	.	.965	3	.640

a. Lilliefors Significance Correction

ANOVA

Reduction

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1344.567	4	336.142	84.223	.000
Within Groups	39.911	10	3.991		
Total	1384.478	14			

Multiple Comparisons

Dependent Variable: Reduction

Tukey HSD

		Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
(I) Formula	(J) Formula					
F1	F2	18.87755*	1.63118	.000	13.5092	24.2459
	F3	18.47485*	1.63118	.000	13.1065	23.8432
	F4	12.70352*	1.63118	.000	7.3352	18.0719
	F5	-3.89966	1.63118	.195	-9.2680	1.4687
F2	F1	-18.87755*	1.63118	.000	-24.2459	-13.5092
	F3	-.40270	1.63118	.999	-5.7710	4.9656
	F4	-6.17403*	1.63118	.023	-11.5424	-.8057
	F5	-22.77722*	1.63118	.000	-28.1456	-17.4089

F3	F1	-18.47485*	1.63118	.000	-23.8432	-13.1065
	F2	.40270	1.63118	.999	-4.9656	5.7710
	F4	-5.77134*	1.63118	.034	-11.1397	-.4030
	F5	-22.37452*	1.63118	.000	-27.7429	-17.0062
F4	F1	-12.70352*	1.63118	.000	-18.0719	-7.3352
	F2	6.17403*	1.63118	.023	.8057	11.5424
	F3	5.77134*	1.63118	.034	.4030	11.1397
	F5	-16.60318*	1.63118	.000	-21.9715	-11.2348
F5	F1	3.89966	1.63118	.195	-1.4687	9.2680
	F2	22.77722*	1.63118	.000	17.4089	28.1456
	F3	22.37452*	1.63118	.000	17.0062	27.7429
	F4	16.60318*	1.63118	.000	11.2348	21.9715

*. The mean difference is significant at the 0.05 level.

Uji permeasi secara *ex vivo*

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
Formula	Statistic	df	Sig.	Statistic	df	Sig.	
Permeat	TDMN2	.196	3	.	.996	3	.878
	Krim MNX	.351	3	.	.827	3	.180

a. Lilliefors Significance Correction

Independent Samples Test

		t-test for Equality of Means								
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Permeat	Equal variances assumed	1.259	.325	8.692	4	.001	73.97333	8.51092	50.34324	97.60343
	Equal variances not assumed			8.692	2.718	.005	73.97333	8.51092	45.22724	102.71942

Fluks

Tests of Normality

Formula		Kolmogorov-Smirnov[a] Statistic	df	Sig.	Shapiro-Wilk Statistic	df	Sig.
Fluks	TDMN2	.383	3	.	.755	3	.010
	Krim MNX	.301	3	.	.912	3	.424

a. Lilliefors Significance Correction

Test Statistics[a]

	Fluks
Mann-Whitney U	.000
Wilcoxon W	6.000
Z	-1.964
Asymp. Sig. (2-tailed)	.050
Exact Sig. [2*(1-tailed Sig.)]	.100[b]

a. Grouping Variable: Formula

b. Not corrected for ties.

Lampiran 8. Dokumentasi

Gambar 16. Pengukuran Kurva Baku

Gambar 17. Pengujian kekuatan mekanik dan kemampuan penetrasi

Gambar 18. Pengujian permeasi secara *ex vivo*