

LAMPIRAN

Lampiran 1. Hasil Determinasi Tanaman



BAGIAN BIOLOGI FARMASI
FAKULTAS FARMASI
UNIVERSITAS GADJAH MADA YOGYAKARTA
 Alamat: Sekip Utara Jl. Kaliurang Km 4, Yogyakarta 55281
 Telp. , 0274.542738, 0274.649.2568 Fax. +274-543120

SURAT KETERANGAN
No.: BF/48/Ident/Det/III/2015

Kepada Yth. :
Sdri/Sdr. Waralita Mayudanti
NIM. 20120350061
Fakultas Farmasi UMY
Di Yogyakarta

Dengan hormat,

Bersama ini kami sampaikan hasil identifikasi/determinasi sampel yang Saudara kirimkan ke Bagian Biologi Farmasi, Fakultas Farmasi UGM, adalah :

No.Pendaftaran	Jenis	Suku
48	<i>Piper nigrum</i> L.	Piperaceae

Demikian, semoga dapat digunakan sebagaimana mestinya.

Yogyakarta, 26 Januari 2015
 Ketua

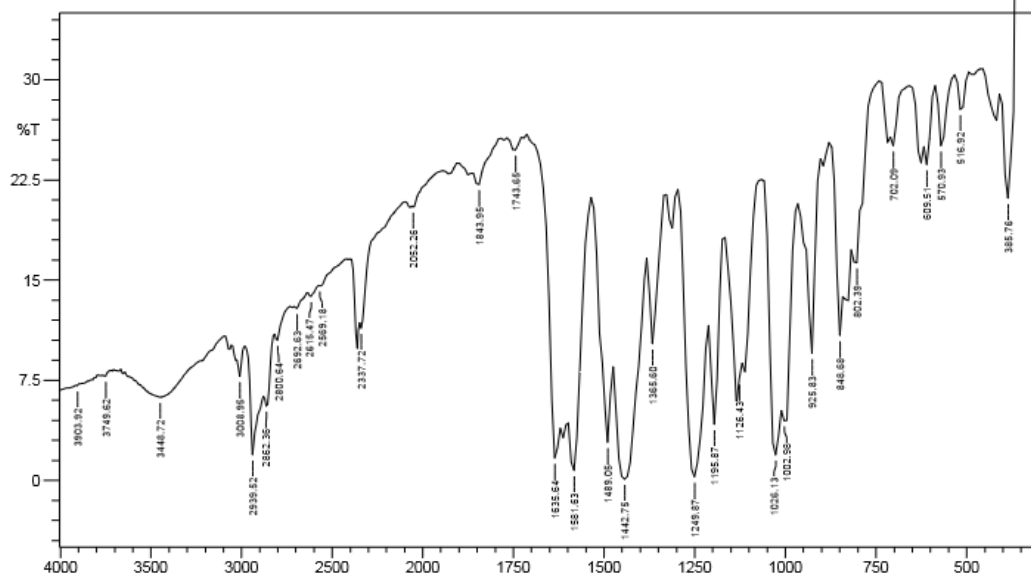


Prof. Dr. Wahyono, SU., Apt.
 NIP. 195007011977021001

Lampiran 2. Hasil FTIR Kristal Alkaloid lada



Lab. Kimia Organik FMIPA - UGM



No.	Peak	Intensity	Corr. Intensity	Base (H)	Base (L)	Area	Corr. Area
1	385.76	21.09	17.26	401.19	362.62	21.32	6.57
2	516.92	27.75	2.68	532.35	493.78	20.64	0.73
3	570.93	25.03	4.68	586.36	540.07	25.88	1.56
4	609.51	23.63	5.28	648.08	594.08	31.99	2.96
5	702.09	25.03	4.63	732.95	655.8	43.17	2.4
6	802.39	16.29	3.48	817.82	740.67	48.15	1.08
7	848.68	10.83	10.82	871.82	817.82	44.68	7.17
8	925.83	9.47	12.45	964.41	910.4	43.03	7.15
9	1002.98	4.45	3.75	1010.7	972.12	39.53	4.01
10	1026.13	1.9	9.05	1056.99	1010.7	60.1	13.09
11	1126.43	7.58	12.27	1165	1064.71	89.52	20.36
12	1195.87	4.16	10	1211.3	1172.72	40.15	8.48
13	1249.87	0.24	14.38	1296.16	1219.01	111.07	45.38
14	1365.6	10.22	7.96	1381.03	1334.74	38.26	5.09
15	1442.75	0.07	10.78	1473.62	1388.75	144.03	64.55
16	1489.05	2.83	5.85	1527.62	1481.33	52.57	6.91
17	1581.63	0.74	7.77	1597.06	1535.34	74.01	15.27
18	1635.64	1.66	5.9	1712.79	1620.21	87.25	6.18
19	1743.65	24.73	0.8	1759.08	1728.22	18.54	0.26
20	1843.95	22.12	1.41	1859.38	1789.94	43.2	0.61
21	2052.26	20.44	0.24	2059.98	1944.25	76.22	0.11
22	2337.72	11.39	0.7	2345.44	2098.55	183.21	0.27
23	2569.18	14.55	0.12	2576.9	2422.59	124.4	0.17
24	2615.47	13.77	0.4	2630.91	2576.9	45.93	0.36
25	2692.63	12.86	0.38	2708.06	2638.62	60.61	0.36
26	2800.64	10.48	0.84	2816.07	2738.92	71.44	0.59
27	2862.36	5.55	1.32	2870.08	2823.79	51.67	2.2
28	2939.52	1.9	6.66	2978.09	2877.79	131.13	19.87
29	3008.95	7.77	2.25	3047.53	2985.81	64.63	2.98
30	3448.72	6.2	2.84	3641.6	3093.82	607.34	43.84
31	3749.62	7.8	0.21	3765.05	3726.47	42.33	0.18
32	3903.92	7.06	0.1	3911.64	3795.91	130.85	0.64

Lampiran 3. Hasil uji titik lebur kristal alkaloid lada

UNIVERSITAS GADJAH MADA
FAKULTAS MATEMATIKA DAN ILMU PENGETAHUAN ALAM
LABORATORIUM KIMIA ORGANIK
Sekip Utara, Yogyakarta 55281 telp./fax [0274] 563467, 902122

TITIK LELEH
“ Electrothermal ”

Nama : Ratih Dwi Amaliah
Instansi : F. farmasi UMY

No.	Nama Sampel	Hasil pengukuran (°C)	Keterangan
1.	Sampel Piperin	122-132	Meleleh

 Operator

Rochfitni

Lampiran 4. Perhitungan konsentrasi larutan piperin dalam metanol dan perhitungan absorptivitas molar (ϵ)

$$\text{Konsentrasi awal (M1)} = 1\text{mg/ml} = 0,001\text{ g/ml} = 0,1\text{ g/100ml} = 0,1\%$$

Pengenceran pertama

$$\begin{aligned} M1 \times V1 &= M2 \times V2 \\ 0,1 \times 1\text{ ml} &= M2 \times 10\text{ ml} \\ 0,1 &= M2 \times 10 \\ M2 &= 0,1/10 = 0,01\% \text{ (Konsentrasi pada pengenceran pertama)} \end{aligned}$$

Pengenceran kedua

$$\begin{aligned} M2 \times V3 &= M3 \times V3 \\ 0,01 \times 1\text{ ml} &= M3 \times 10\text{ ml} \\ 0,01 &= M3 \times 10 \\ M3 &= 0,01/10 = 0,001\% \text{ (Konsentrasi pada pengenceran kedua)} \end{aligned}$$

Perhitungan absorptivitas molar (ϵ)

Diketahui: $A = 1,075$; $b = 1\text{ cm}$; $c = 0,001\%$

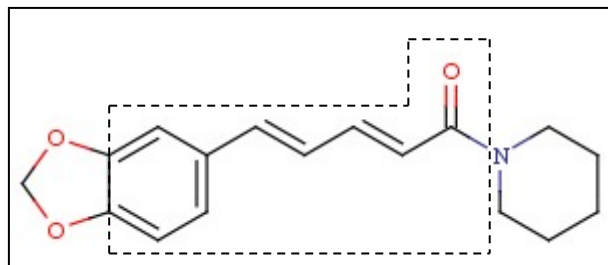
Ditanya : absorptivitas molar (ϵ) = ...?

Jawab:

$$E_{1\text{ cm}}^{1\%} = \frac{A}{b \times c} = \frac{1,075}{1 \times 0,001} = 1.075$$

$$\epsilon = E_{1\text{ cm}}^{1\%} \times \frac{BM}{10} = 1.075 \times \frac{285,35}{10} = 30.675,125 \text{ (}\lambda_{\text{maks}} = 342,5\text{ nm)}$$

Lampiran 5. Perhitungan panjang gelombang gugus enon berdasarkan Woodward's Rule



EMPIRICAL RULES FOR ENONES																												
$\begin{array}{c} \beta & \alpha & & \\ & & & \\ \beta - C = C - C = O \end{array}$	$\begin{array}{c} \delta & \gamma & \beta & \alpha & & \\ & & & & & \\ \delta - C = C - C = C - C = \end{array}$																											
Base values: Six-membered ring or acyclic parent enone = 215 nm Five-membered ring parent enone = 202 nm Acyclic dienone = 245 nm																												
Increments for: Double-bond-extending conjugation = 30 Alkyl group or ring residue <table style="margin-left: 20px;"> <tr><td>α</td><td>10</td></tr> <tr><td>β</td><td>12</td></tr> <tr><td>γ and higher</td><td>18</td></tr> </table>		α	10	β	12	γ and higher	18																					
α	10																											
β	12																											
γ and higher	18																											
Polar groupings: -OH <table style="margin-left: 20px;"> <tr><td>α</td><td>35</td></tr> <tr><td>β</td><td>30</td></tr> <tr><td>δ</td><td>50</td></tr> </table> -OCOCH ₃ <table style="margin-left: 20px;"> <tr><td>α, β, δ</td><td>6</td></tr> </table> -OCH ₃ <table style="margin-left: 20px;"> <tr><td>α</td><td>35</td></tr> <tr><td>β</td><td>30</td></tr> <tr><td>γ</td><td>17</td></tr> <tr><td>δ</td><td>31</td></tr> </table> -Cl <table style="margin-left: 20px;"> <tr><td>α</td><td>15</td></tr> <tr><td>β</td><td>12</td></tr> </table> -Br <table style="margin-left: 20px;"> <tr><td>α</td><td>25</td></tr> <tr><td>β</td><td>30</td></tr> </table> -NR ₂ <table style="margin-left: 20px;"> <tr><td>β</td><td>95</td></tr> </table> Exocyclic double bond = 5 Homocyclic diene component = 39 Solvent correction = Variable		α	35	β	30	δ	50	α, β, δ	6	α	35	β	30	γ	17	δ	31	α	15	β	12	α	25	β	30	β	95	
α	35																											
β	30																											
δ	50																											
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γ	17																											
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α	15																											
β	12																											
α	25																											
β	30																											
β	95																											
$\lambda_{\text{max}}^{\text{EtOH}}(\text{calc}) = \text{Total}$																												
		Enon asiklik = 215 nm Double-bond-Extending conjugation = 3 × 30 = 90 nm α -CH ₃ = 10 β -CH ₃ = 12 γ -CH ₃ = 18 <hr style="width: 100px; margin-left: auto; margin-right: 0;"/> 345 nm																										

Lampiran 6. Data Pengaruh Pelarut DMSO terhadap Kontraksi Otot Polos ileum

a. Data Persentase Kontraksi Otot Polos Ileum Akibat Pemberian Seri Konsentrasi Histamin (Kontrol)

Log	Respon kontraksi*					Mean	SEM
	1	2	3	4	5		
-10,0	6,666667	5,56	6	5,00	5,88	5,87	0,29
-9,5	6,666667	5,56	6	5,00	5,88	5,87	0,29
-9,0	6,666667	11,11	6	5,00	11,76	8,16	1,37
-8,5	26,66667	11,11	10	5,00	11,76	12,91	3,64
-8,0	40	20,00	10	10,00	11,76	18,35	5,72
-7,5	40	22,22	13	10,00	15,29	20,00	5,40
-7,0	40	22,22	23	20,00	17,65	24,47	3,98
-6,5	46,66667	33,33	28	25,00	56,47	37,79	5,99
-6,0	53,33333	33,33	50	50,00	63,53	50,04	4,86
-5,5	60	44,44	75	70,00	68,24	63,54	5,35
-5,0	66,66667	55,56	75	80,00	91,76	73,80	6,11
-4,5	90,66667	77,77778	100	100,00	100	93,69	4,37
-4	93,33333	88,88889	100	100	100	96,44	2,29
-3,52	100	100	100	100	100	100,00	0,00

Keterangan * : % Respon kontraksi dihitung berdasarkan kontraksi otot polos ileum maksimal yang dicapai oleh seri konsentrasi histamin (kontrol). Media: Larutan buffer tyrode

a. Data Pengaruh Pelarut DMSO terhadap Kontraksi Otot Polos ileum akibat pemberian DMSO 100 uL + seri kadar Histamin

Log	Respon kontraksi *					Mean	SEM
	1	2	3	4	5		
-10,0	6,666667	5,555556	6	5	5,882353	5,87	0,29
-9,5	6,666667	5,555556	6	5	5,882353	5,87	0,29
-9,0	13,333333	5,555556	6	5	5,882353	7,20	1,55
-8,5	13,333333	11,111111	6	5	11,76471	9,49	1,63
-8,0	13,333333	11,111111	6	5	11,76471	9,49	1,63
-7,5	24	11,111111	6	5	11,76471	11,63	3,36
-7,0	26,66667	16,66667	13	10	15,29412	16,23	2,85
-6,5	26,66667	22,22222	13	10	17,64706	17,81	3,06
-6,0	33,333333	22,22222	38	60	52,94118	41,20	6,81
-5,5	73,333333	33,333333	50	70	63,52941	58,04	7,36
-5,0	80	55,55556	88	90	70,58824	76,73	6,28
-4,5	86,66667	88,88889	106,25	100	94,11765	95,18	3,60
-4	100	88,88889	93,75	100	100	96,53	2,26
-3,52	100	88,88889	93,75	100	100	96,53	2,26

Keterangan * : % Respon kontraksi dihitung berdasarkan kontraksi otot polos ileum maksimal yang dicapai oleh seri konsentrasi histamin (kontrol)
Media : Larutan buffer tyrode

Lampiran 7. Data Pengaruh Alkaloid Iada Terhadap Reseptor H1 Otot Polos Ileum

a. Data Persentase Kontraksi Otot Polos Ileum Akibat Pemberian Seri Konsentrasi Histamin (Kontrol)

log	Respon kontraksi*										Mean	SEM
	1	2	3	4	5	6	7	8	9	10		
10,0	6,2069	1,7241	3,27	2,63	6,25	5,41	1,92	7,41	6,06	5,88	4,68	0,66
-9,5	6,2069	1,7241	3,27	2,63	6,25	5,41	1,92	7,41	6,06	5,88	4,68	0,66
-9,0	10,3448	2,7586	4,08	2,63	8,75	5,41	3,08	7,41	6,06	5,88	5,64	0,83
-8,5	10,3448	2,7586	7,35	2,63	12,50	5,41	3,08	7,41	12,12	5,88	6,95	1,17
-8,0	13,4483	3,4483	8,16	2,63	15,63	5,41	3,08	7,41	24,24	11,76	9,52	2,17
-7,5	13,7931	3,4483	8,98	2,63	15,63	5,41	3,85	7,41	25,45	16,47	10,31	2,33
-7,0	14,8276	6,8966	10,20	2,63	22,50	5,41	3,85	11,11	39,39	17,06	13,39	3,50
-6,5	17,2414	10,3448	12,24	26,32	25,00	9,73	3,85	11,11	48,48	17,65	18,20	4,02
-6,0	17,2414	15,5172	18,37	31,58	59,38	40,00	5,77	14,81	54,55	23,53	28,07	5,67
-5,5	62,0690	24,1379	48,98	57,89	80,00	62,16	23,08	18,52	78,79	47,06	50,27	7,05
-5,0	89,6552	75,8621	81,63	100,00	100,00	100,00	76,92	54,81	81,82	93	85,36	4,52
-4,5	89,6552	96,5517	100,00	100,00	100,00	100,00	84,62	96,30	87,88	93	94,79	1,81
-4,0	100	100	100,00	100,00	100,00	100,00	92,31	96,30	100,00	100	98,86	0,82
-3,5	100	100	100,00	100,00	100,00	100,00	100	100	100,00	100	100,00	0,00

Keterangan * : % Respon kontraksi dihitung berdasarkan kontraksi otot polos ileum maksimal yang dicapai oleh seri konsentrasi histamin (kontrol) Media : Larutan buffer tyrode

b. Data Persentase Kontraksi Otot Polos Ileum Akibat Pemberian alkaloid lada 1000 μM + Seri Konsentrasi Histamin

Log	Respon kontraksi *					Mean	SEM
	1	2	3	4	5		
-8,0	3,45	4,08	5,26	6,25	5,41	4,89	0,50
-7,5	3,45	4,08	5,26	6,25	5,41	4,89	0,50
-7,0	3,45	4,08	5,26	6,25	5,41	4,89	0,50
-6,5	3,45	4,08	5,26	6,25	5,41	4,89	0,50
-6,0	6,21	4,08	5,26	6,25	5,41	5,44	0,40
-5,5	6,90	4,08	9,47	6,25	5,41	6,42	0,90
-5,0	8,62	4,08	15,79	6,25	5,41	8,03	2,08
-4,5	13,79	10,20	15,79	8,13	10,81	11,74	1,36
-4,0	17,24	10,20	36,84	25,00	26,49	23,15	4,50
-3,5	24,14	20,41	52,63	56,25	43,24	39,33	7,31
-3,0	41,38	46,94	78,95	87,50	59,46	62,84	8,92
-2,5	68,96552	89,79592	78,94737	87,5	59,45946	76,93	5,70
-2,0	68,96552	89,79592	78,94737	87,5	59,45946	76,93	5,70
-1,5	68,96552	89,79592	78,94737	87,5	59,45946	76,93	5,70

Keterangan * : % Respon kontraksi dihitung berdasarkan kontraksi otot polos ileum maksimal yang dicapai oleh seri konsentrasi histamin (kontrol) Media : Larutan buffer tyrode

c. Data Persentase Kontraksi Otot Polos ileum Akibat Pemberian Alkaloid lada 5000 μ M + Seri Konsentrasi Histamin

Log	Respon kontraksi *				Mean	SEM
	1	2	3	4		
-8,0	1,92	2,00	3,03	5,88	3,21	0,93
-7,5	1,92	2,00	3,03	5,88	3,21	0,93
-7,0	1,92	2,00	3,03	5,88	3,21	0,93
-6,5	1,92	2,00	6,06	5,88	3,97	1,16
-6,0	1,92	2,00	12,12	11,76	6,95	2,88
-5,5	1,92	2,00	18,18	11,76	8,47	3,98
-5,0	3,85	2,00	30,30	11,76	11,98	6,46
-4,5	3,85	2,00	42,42	11,76	15,01	9,38
-4,0	5,77	2,00	54,55	17,65	19,99	11,99
-3,5	9,62	24,00	60,61	23,53	29,44	10,91
-3,0	26,92	56,00	63,64	35,29	45,46	8,60
-2,5	84,61538	80	66,66667	35,29412	66,64	11,12
-2,0	96,15385	96	66,66667	35,29412	73,53	14,51
-1,5	96,15385	96	66,66667	55,88235	78,68	10,28

Keterangan * : % Respon kontraksi dihitung berdasarkan kontraksi otot polos ileum maksimal yang dicapai oleh seri konsentrasi histamin (kontrol) Media : Larutan buffer tyrode

Lampiran 8. Data Uji Reversibilitas Alkaloid lada 1000 μM dan 5000 μM
Terhadap Reseptor H1 Otot Polos ileum

- a. Data Persentase Kontraksi Otot Polos ileum Akibat Pemberian Seri
Konsentrasi Histamin (Kontrol)

Log	Respon kontraksi										Mean	SEM
	1	2	3	4	5	6	7	8	9	10		
-10,0	6,2069	1,7241	3,27	2,63	6,25	5,41	1,92	7,41	18,18	5,88	5,89	1,51
-9,5	6,2069	1,7241	3,27	2,63	6,25	5,41	1,92	7,41	18,18	5,88	5,89	1,51
-9,0	10,3448	2,7586	4,08	2,63	8,75	5,41	3,08	7,41	21,21	5,88	7,16	1,77
-8,5	10,3448	2,7586	7,35	2,63	12,50	5,41	3,08	7,41	42,42	5,88	9,98	3,75
-8,0	13,4483	3,4483	8,16	2,63	15,63	5,41	3,08	7,41	48,48	11,76	11,95	4,30
-7,5	13,7931	3,4483	8,98	2,63	15,63	5,41	3,85	7,41	48,48	16,47	12,61	4,30
-7,0	14,8276	6,8966	10,20	2,63	22,50	5,41	3,85	11,11	48,48	17,06	14,30	4,28
-6,5	17,2414	10,3448	12,24	26,32	25,00	9,73	3,85	11,11	60,61	17,65	19,41	5,08
-6,0	17,2414	15,5172	18,37	31,58	59,38	40,00	5,77	14,81	60,61	23,53	28,68	6,01
-5,5	62,0690	24,1379	48,98	57,89	80,00	62,16	23,08	18,52	84,85	47,06	50,87	7,35
-5,0	89,6552	75,8621	81,63	100,00	100,00	100,00	76,92	54,81	100,00	93	87,18	4,72
-4,5	89,6552	96,5517	100,00	100,00	100,00	100,00	84,62	96,30	100,00	93	96,01	1,70
-4,0	100	100,0000	100,00	100,00	100,00	100,00	92,31	96,30	100,00	100	98,86	0,82
-3,5	100	100,0000	100,00	100,00	100,00	100,00	100	100	100,00	100	100,00	0,00

Keterangan * : % Respon kontraksi dihitung berdasarkan kontraksi otot polos ileum maksimal yang dicapai oleh seri konsentrasi histamin (kontrol) Media : Larutan buffer tyrode

b. Data Persentase Kontraksi Otot Polos Ileum Pada Uji Reversibilitas Alkaloid lada 1000 μM

Log	Respon kontraksi *					Mean	SEM
	1	2	3	4	5		
-10,0	3,45	4,08	5,26	6,25	5,41	4,89	0,50
-9,5	3,45	4,08	5,26	6,25	5,41	4,89	0,50
-9,0	4,14	4,08	5,26	6,25	5,41	5,03	0,41
-8,5	7,24	4,08	5,26	6,25	5,41	5,65	0,53
-8,0	13,10	4,08	5,26	6,25	5,41	6,82	1,61
-7,5	13,79	4,08	9,47	6,25	8,11	8,34	1,64
-7,0	14,48	4,08	10,53	6,25	8,11	8,69	1,80
-6,5	17,24	8,16	15,79	6,25	12,97	12,08	2,13
-6,0	20,69	20,41	36,84	12,50	31,35	24,36	4,33
-5,5	65,52	69,39	63,16	81,25	70,27	69,92	3,11
-5,0	89,66	77,55	78,95	100,00	86,49	86,53	4,06
-4,5	89,65517	77,55102	84,21053	100	100	90,28334	4,40575
-4,0	100	77,55102	84,21053	100	100	92,35231	4,800147
-3,5	100	77,55102	84,21053	100	100	92,35231	4,800147

Keterangan * : % Respon kontraksi dihitung berdasarkan kontraksi otot polos ileum maksimal yang dicapai oleh seri konsentrasi histamin (kontrol) Media : Larutan buffer tyrode

- c. Data Persentase Kontraksi Otot Polos Ileum Pada Uji Reversibilitas Alkaloid lada 5000 μM

log	Respon kontraksi *				Mean	SEM
	1	2	3	4		
-8,0	3,08	4,00	6,06	17,65	7,70	3,38
-7,5	3,08	4,00	6,06	17,65	7,70	3,38
-7,0	3,85	4,00	12,12	17,65	9,40	3,36
-6,5	3,85	4,00	13,94	17,65	9,86	3,51
-6,0	5,77	4,00	18,18	17,65	11,40	3,78
-5,5	7,69	4,00	18,18	17,65	11,88	3,57
-5,0	9,62	4,00	21,21	17,65	13,12	3,89
-4,5	19,23	4,00	24,24	20,59	17,02	4,47
-4,0	26,92	12,00	42,42	41,18	30,63	7,14
-3,5	46,15	40,00	60,61	52,94	49,93	4,43
-3,0	73,08	72,00	66,67	88,24	74,99	4,63
-2,5	92,30769	92	69,69697	88,23529	85,55999	5,368099
-2,0	96,15385	96	93,93939	100	96,52331	1,264066
-1,5	96,15385	96	93,93939	100	96,52331	1,264066

Keterangan * : % Respon kontraksi dihitung berdasarkan kontraksi otot polos ileum maksimal yang dicapai oleh seri konsentrasi histamin (kontrol) Media : Larutan buffer tyrode

Lampiran 9. Data Pengaruh Difenhidramin Terhadap Reseptor H1 Otot Polos Ileum

- a. Data Persentase Kontraksi Otot Polos Ileum Akibat Pemberian Seri Konsentrasi Histamin (Kontrol)

Log	Respon kontraksi*										Mean	SEM
	1	2	3	4	5	6	7	8	9	10		
-10,0	3,7037	10,0000	5,41	1,72	4,44	5,26	5,56	18,18	5,88	6,25	6,64	1,44
-9,5	3,7037	12,5000	5,41	1,72	13,33	5,26	11,11	18,18	5,88	6,25	8,34	1,63
-9,0	5,5556	14,0000	5,41	2,76	22,22	7,89	11,11	21,21	5,88	8,75	10,48	2,12
-8,5	14,8148	15,0000	5,41	2,76	22,22	7,89	16,67	42,42	5,88	12,50	14,56	3,63
-8,0	14,8148	15,0000	5,41	6,90	31,11	10,53	17,78	48,48	11,76	15,63	17,74	4,09
-7,5	18,5185	15,0000	5,41	10,34	37,78	10,53	19,44	48,48	16,47	15,63	19,76	4,19
-7,0	22,2222	22,5000	5,41	10,34	44,44	10,53	25,00	48,48	17,06	22,50	22,85	4,44
-6,5	37,0370	40,0000	9,73	15,52	56,89	21,05	33,33	60,61	17,65	25,00	31,68	5,45
-6,0	87,0370	75,0000	40,00	41,38	62,22	36,84	50,00	60,61	23,53	59,38	53,60	6,02
-5,5	96,2963	89,0000	62,16	55,17	84,44	63,16	69,44	84,85	47,06	80,00	73,16	5,10
-5,0	97,7778	100,0000	100,00	75,86	93,33	86,84	88,89	100,00	92,94	100,00	93,56	2,50
-4,5	97,7778	100,0000	100,00	96,55	100,00	100,00	97,22	100,00	92,94	100,00	98,45	0,75
-4,0	100	100,0000	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	0,00
-3,5	100	100,0000	100,00	100,00	100,00	100,00	100	100	100,00	100,00	100,00	0,00

Keterangan * : % Respon kontraksi dihitung berdasarkan kontraksi otot polos ileum maksimal yang dicapai oleh seri konsentrasi histamin (kontrol) Media : Larutan buffer tyrode

b. Data Persentase Kontraksi Otot Polos Ileum Akibat Pemberian difenhidramin 0,01 μ M + Seri Konsentrasi Histamin

Log	Respon kontraksi *					Mean	SEM
	1	2	3	4	5		
-10,0	7,41	3,45	5,00	5,41	6,25	5,50	0,60
-9,5	7,41	4,83	10,00	5,41	6,25	6,78	0,84
-9,0	7,41	6,21	10,00	5,41	6,25	7,05	0,73
-8,5	7,41	6,55	17,50	5,41	6,25	8,62	2,05
-8,0	11,11	6,90	19,50	5,41	6,25	9,83	2,38
-7,5	14,81	6,90	20,00	5,41	6,25	10,67	2,63
-7,0	14,81	10,34	22,50	5,41	6,25	11,86	2,87
-6,5	22,22	10,34	30,00	10,81	8,13	16,30	3,85
-6,0	37,04	27,59	47,50	26,49	25,00	32,72	3,88
-5,5	62,96	51,72	75,00	43,24	56,25	57,84	4,89
-5,0	81,48	70,34	90,00	86,49	81,25	81,91	3,03
-4,5	92,59259	86,2069	90	97,2973	100	93,22	2,26
-4,0	100	100	95	97,2973	100	98,46	0,92
-3,5	100	100	100	97,2973	100	99,46	0,49

Keterangan * : % Respon kontraksi dihitung berdasarkan kontraksi otot polos ileum maksimal yang dicapai oleh seri konsentrasi histamin (kontrol) Media : Larutan buffer tyrode

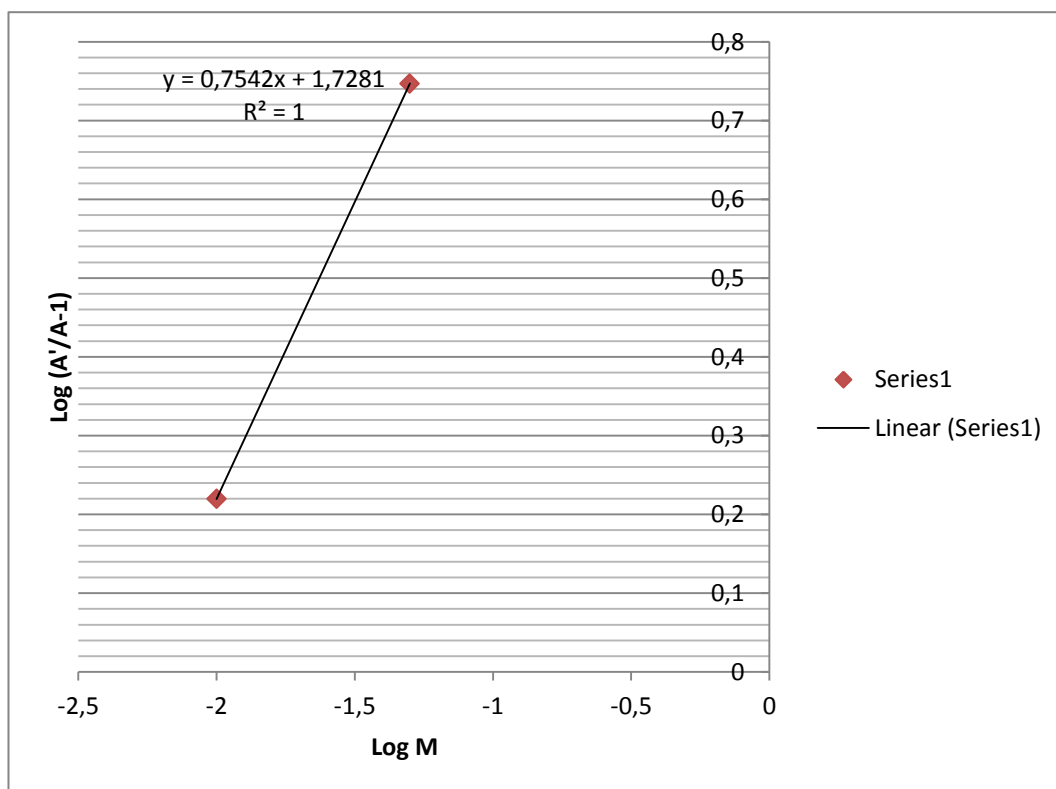
c. Data Persentase Kontraksi Otot Polos ileum Akibat Pemberian Difenhidramin 0,05 μ M + Seri Konsentrasi Histamin

Log	Respon kontraksi *					Mean	SEM
	1	2	3	4	5		
-10,0	13,33	5,26	12,12	11,11	5,88	9,54	1,66
-9,5	13,33	5,26	12,12	11,11	5,88	9,54	1,66
-9,0	13,33	5,26	12,12	11,11	11,76	10,72	1,41
-8,5	13,33	5,26	24,24	11,11	11,76	13,14	3,09
-8,0	13,33	5,26	24,24	11,11	11,76	13,14	3,09
-7,5	13,33	10,53	30,30	13,89	12,94	16,20	3,57
-7,0	17,78	10,53	36,36	13,89	14,71	18,65	4,58
-6,5	26,67	15,79	48,48	13,89	16,47	24,26	6,45
-6,0	46,67	26,32	48,48	19,44	17,65	31,71	6,64
-5,5	48,89	28,95	60,61	36,11	23,53	39,62	6,75
-5,0	65,78	63,16	66,67	72,22	35,29	60,62	6,50
-4,5	80	84,21053	66,67	83,33	55,88235	74,01858	5,519924
-4,0	97,77778	97,36842	96,97	100,00	94,11765	97,24671	0,941945
-3,5	97,77778	97,36842	96,97	100,00	94,11765	97,24671	0,941945

Keterangan * : % Respon kontraksi dihitung berdasarkan kontraksi otot polos ileum maksimal yang dicapai oleh seri konsentrasi histamin (kontrol) Media : Larutan buffer tyrode

Lampiran 10. Perhitungan Parameter Antagonis (pA2) difenhidramin Terhadap Reseptor H1

	pD2	A or A'	A'/A	x-1	log(x-1)	Kons M		Log M
						(uM)		
Kontrol	6,1	0,00000079						
(+) Difenhidramin 0,01 μ M	5,67	0,0000021	2,658228	1,658228	0,219644	0,01	0,001	-2
(+) Difenhidramin 0,05 μ M	5,28	0,0000052	6,582278	5,582278	0,746811	0,05	0,005	1,30103



Lampiran 11. Hasil Uji Statistik Pada Uji Pengaruh Pelarut DMSO Terhadap Kontraksi Otot Polos Ileum

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
kontrol	5	100.0%	0	.0%	5	100.0%
DMSO	5	100.0%	0	.0%	5	100.0%

Descriptives

		Statistic	Std. Error	
kontrol	Mean	5.9220	.17217	
	95% Confidence Interval for Mean	Lower Bound	5.4440	
		Upper Bound	6.4000	
	5% Trimmed Mean	5.9400		
	Median	6.0000		
	Variance	.148		
	Std. Deviation	.38499		
	Minimum	5.26		
	Maximum	6.26		
	Range	1.00		
	Interquartile Range	.54		
	Skewness	-1.795	.913	
	Kurtosis	3.720	2.000	
DMSO	Mean	5.7180	.17906	
	95% Confidence Interval for Mean	Lower Bound	5.2208	
		Upper Bound	6.2152	
	5% Trimmed Mean	5.7294		
	Median	5.8000		
	Variance	.160		
	Std. Deviation	.40040		
	Minimum	5.13		
	Maximum	6.10		
	Range	.97		
	Interquartile Range	.75		
	Skewness	-.788	.913	
	Kurtosis	-.551	2.000	

Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
kontrol	.380	5	.017	.795	5	.073
DMSO	.189	5	.200 [*]	.925	5	.563

a. Lilliefors Significance Correction

*. This is a lower bound of the true significance.

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	kontrol	5.9220	5	.38499	.17217
	DMSO	5.7180	5	.40040	.17906

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	kontrol & DMSO	5	.787	.114

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	kontrol - DMSO	.20400	.25657	.11474	-.11458	.52258	1.778	4	.150

Lampiran 12. Hasil Uji Statistik Pada Uji Pengaruh alkaloid lada dan difenhidramin terhadap Kontraksi Otot Polos ileum yang diinduksi histamin.

Case Processing Summary

Dosis		Cases					
		Valid		Missing		Total	
		N	Percent	N	Percent	N	Percent
pD2	seri kadar histamin	10	100.0%	0	.0%	10	100.0%
	piperin 100 uL	5	100.0%	0	.0%	5	100.0%
	piperin 500 uL	4	100.0%	0	.0%	4	100.0%
	seri kadar difenhidramin	10	100.0%	0	.0%	10	100.0%
	difhidramin 100 uL	5	100.0%	0	.0%	5	100.0%
	difenhidramin 500 uL	5	100.0%	0	.0%	5	100.0%

Descriptives

Dosis				Statistic	Std. Error
pD2	seri kadar histamin	Mean		5.6110	.11142
		95% Confidence Interval for Mean	Lower Bound	5.3590	
			Upper Bound	5.8630	
		5% Trimmed Mean		5.5844	
		Median		5.5800	
		Variance		.124	
		Std. Deviation		.35234	
		Minimum		5.26	
		Maximum		6.44	
		Range		1.18	
		Interquartile Range		.48	
		Skewness		1.447	.687
		Kurtosis		2.953	1.334
		piperin 100 uL		Mean	
95% Confidence Interval for Mean	Lower Bound			4.7989	
	Upper Bound			5.6891	
5% Trimmed Mean				5.2456	
Median				5.2000	
Variance				.128	
Std. Deviation				.35844	
Minimum				4.84	
Maximum				5.62	
Range				.78	
Interquartile Range				.71	
Skewness				-.085	.913
Kurtosis				-2.760	2.000
piperin 500 uL				Mean	
		95% Confidence Interval for Mean	Lower Bound	3.2816	
			Upper Bound	6.6034	
		5% Trimmed Mean		4.9439	
		Median		4.9550	
		Variance		1.089	
		Std. Deviation		1.04379	
		Minimum		3.66	
		Maximum		6.20	
		Range		2.54	
		Interquartile Range		1.98	
		Skewness		-.070	1.014
		Kurtosis		1.122	2.619
		seri kadar difenhidramin		Mean	
95% Confidence Interval for Mean	Lower Bound			5.7432	
	Upper Bound			6.4528	
5% Trimmed Mean				6.0850	
Median				5.8900	
Variance				.246	
Std. Deviation				.49602	
Minimum				5.49	
Maximum				6.94	
Range				1.45	
Interquartile Range				.75	
Skewness				-.655	.687
Kurtosis				-.940	1.334
difenhidramin 100 uL				Mean	
		95% Confidence Interval for Mean	Lower Bound	5.4199	
			Upper Bound	5.9161	
		5% Trimmed Mean		5.6644	
		Median		5.6200	
		Variance		.040	
		Std. Deviation		.19980	
		Minimum		5.44	
		Maximum		5.96	
		Range		.52	
		Interquartile Range		.36	
		Skewness		-.651	.913
		Kurtosis		-.011	2.000
		difenhidramin 500 uL		Mean	
95% Confidence Interval for Mean	Lower Bound			4.5156	
	Upper Bound			5.7764	
5% Trimmed Mean				5.1289	
Median				5.0000	
Variance				.258	
Std. Deviation				.50772	
Minimum				4.66	
Maximum				5.94	
Range				1.28	
Interquartile Range				.90	
Skewness				1.114	.913
Kurtosis				.791	2.000

Tests of Normality

Dosis	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
pD2 seri kadar histamin	.216	10	.200*	.853	10	.064
piperin 100 uL	.240	5	.200*	.881	5	.314
piperin 500 uL	.199	4		.985	4	.928
seri kadar difenhidramin	.239	10	.110	.897	10	.202
difhidramin 100 uL	.195	5	.200*	.972	5	.885
difenhidramin 500 uL	.213	5	.200*	.920	5	.528

a. Lilliefors Significance Correction

*. This is a lower bound of the true significance.

ANOVA

pD2

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	5.858	5	1.172	4.655	.003
Within Groups	8.305	33	.252		
Total	14.163	38			

Multiple Comparisons

Dependent Variable: pD2

	(I) Dosis	(J) Dosis	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Tukey HSD	seri kadar histamin	piperin 100 uL	.36700	.27477	.763	-.4638	1.1978
		piperin 500 uL	.66850	.29679	.242	-.2288	1.5658
		seri kadar difenhidramin	-.48700	.22435	.278	-1.1653	.1913
		difenhidramin 100 uL	-.05700	.27477	1.000	-.8878	.7738
		difenhidramin 500 uL	.46500	.27477	.546	-.3658	1.2958
	piperin 100 uL	seri kadar histamin	-.36700	.27477	.763	-1.1978	.4638
		piperin 500 uL	.30150	.33652	.945	-.7160	1.3190
		seri kadar difenhidramin	-.85400	.27477	.041	-1.6848	-.0232
		difenhidramin 100 uL	-.42400	.31728	.763	-1.3833	.5353
	piperin 500 uL	difenhidramin 500 uL	.09800	.31728	1.000	-.8613	1.0573
		seri kadar histamin	-.66850	.29679	.242	-1.5658	.2288
		piperin 100 uL	-.30150	.33652	.945	-1.3190	.7160
		seri kadar difenhidramin	-1.15550	.29679	.006	-2.0528	-.2582
	seri kadar difenhidramin	difenhidramin 100 uL	-.72550	.33652	.285	-1.7430	.2920
		difenhidramin 500 uL	-.20350	.33652	.990	-1.2210	.8140
		seri kadar histamin	.48700	.22435	.278	-.1913	1.1653
		piperin 100 uL	.85400	.27477	.041	.0232	1.6848
	difenhidramin 100 uL	piperin 500 uL	1.15550	.29679	.006	.2582	2.0528
		difenhidramin 100 uL	.43000	.27477	.626	-.4008	1.2608
		difenhidramin 500 uL	.95200	.27477	.017	.1212	1.7828
		seri kadar histamin	.05700	.27477	1.000	-.7738	.8878
	difenhidramin 500 uL	piperin 100 uL	.42400	.31728	.763	-.5353	1.3833
		piperin 500 uL	.72550	.33652	.285	-.2920	1.7430
		seri kadar difenhidramin	-.43000	.27477	.626	-1.2608	.4008
difenhidramin 500 uL		.52200	.31728	.576	-.4373	1.4813	
LSD	seri kadar histamin	seri kadar histamin	-.46500	.27477	.546	-1.2958	.3658
		piperin 100 uL	-.09800	.31728	1.000	-1.0573	.8613
		piperin 500 uL	.20350	.33652	.990	-.8140	1.2210
		seri kadar difenhidramin	-.95200	.27477	.017	-1.7828	-.1212
		difenhidramin 100 uL	-.52200	.31728	.576	-1.4813	.4373
	piperin 100 uL	piperin 100 uL	.36700	.27477	.191	-.1920	.9260
		piperin 500 uL	.66850	.29679	.031	.0647	1.2723
		seri kadar difenhidramin	-.48700	.22435	.037	-.9434	-.0306
		difenhidramin 100 uL	-.05700	.27477	.837	-.6160	.5020
	piperin 500 uL	difenhidramin 500 uL	.46500	.27477	.100	-.0940	1.0240
		seri kadar histamin	-.36700	.27477	.191	-.9260	.1920
		piperin 500 uL	.30150	.33652	.377	-.3832	.9862
seri kadar difenhidramin		-.85400	.27477	.004	-1.4130	-.2950	
seri kadar difenhidramin	difenhidramin 100 uL	-.42400	.31728	.191	-1.0695	.2215	
	difenhidramin 500 uL	.09800	.31728	.759	-.5475	.7435	
	seri kadar histamin	-.66850	.29679	.031	-1.2723	-.0647	
	piperin 100 uL	-.30150	.33652	.377	-.9862	.3832	
difenhidramin 100 uL	seri kadar difenhidramin	-1.15550	.29679	.000	-1.7593	-.5517	
	difenhidramin 100 uL	-.72550	.33652	.038	-1.4102	-.0408	
	difenhidramin 500 uL	-.20350	.33652	.550	-.8882	.4812	
	seri kadar histamin	.48700	.22435	.037	.0306	.9434	
difenhidramin 500 uL	piperin 100 uL	.85400	.27477	.004	.2950	1.4130	
	piperin 500 uL	1.15550	.29679	.000	.5517	1.7593	
	difenhidramin 100 uL	.43000	.27477	.127	-.1290	.9890	
	difenhidramin 500 uL	.95200	.27477	.001	.3930	1.5110	
seri kadar difenhidramin	seri kadar histamin	.05700	.27477	.837	-.5020	.6160	
	piperin 100 uL	.42400	.31728	.191	-.2215	1.0695	
	piperin 500 uL	.72550	.33652	.038	.0408	1.4102	
	seri kadar difenhidramin	-.43000	.27477	.127	-.9890	.1290	
piperin 100 uL	difenhidramin 500 uL	.52200	.31728	.109	-.1235	1.1675	
	seri kadar histamin	-.46500	.27477	.100	-1.0240	.0940	
	piperin 100 uL	-.09800	.31728	.759	-.7435	.5475	
	piperin 500 uL	.20350	.33652	.550	-.4812	.8882	
piperin 500 uL	seri kadar difenhidramin	-.95200	.27477	.001	-1.5110	-.3930	
	difenhidramin 100 uL	-.52200	.31728	.109	-1.1675	.1235	

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

Lampiran 13. Hasil Uji Statistik Reversibilitas Kontraksi Otot Polos Ileum

Case Processing Summary

Recovery	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
pD2 kontrol	10	100.0%	0	.0%	10	100.0%
recovery 100 uL	5	100.0%	0	.0%	5	100.0%
recovery 500 uL	4	100.0%	0	.0%	4	100.0%

Descriptives

Recovery	Statistic	Std. Error
pD2 kontrol	Mean	5.6110
	95% Confidence Interval for Mean	5.3590
	Lower Bound	5.8630
	Upper Bound	5.5844
	5% Trimmed Mean	5.5800
	Median	.124
	Variance	.35234
	Std. Deviation	.526
	Minimum	6.44
	Maximum	1.18
	Range	.48
	Interquartile Range	1.447
	Skewness	.687
Kurtosis	2.953	
recovery 100 uL	Mean	5.7360
	95% Confidence Interval for Mean	5.6981
	Lower Bound	5.7739
	Upper Bound	5.7361
	5% Trimmed Mean	5.7400
	Median	.001
	Variance	.03050
	Std. Deviation	5.70
	Minimum	5.77
	Maximum	.07
	Range	.06
	Interquartile Range	-.162
	Skewness	.913
Kurtosis	-2.501	
recovery 500 uL	Mean	5.5450
	95% Confidence Interval for Mean	5.2418
	Lower Bound	5.8482
	Upper Bound	5.5411
	5% Trimmed Mean	5.5100
	Median	.036
	Variance	.19053
	Std. Deviation	5.36
	Minimum	5.80
	Maximum	.44
	Range	.36
	Interquartile Range	.907
	Skewness	1.014
Kurtosis	2.619	

Tests of Normality

Recovery	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
pD2 kontrol	.216	10	.200*	.853	10	.064
recovery 100 uL	.203	5	.200*	.923	5	.549
recovery 500 uL	.198	4	.200*	.954	4	.743

a. Lilliefors Significance Correction

*. This is a lower bound of the true significance.

ANOVA

pD2

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.087	2	.043	.563	.580
Within Groups	1.231	16	.077		
Total	1.317	18			

Multiple Comparisons

Dependent Variable: pD2

	(I) Recovery	(J) Recovery	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Tukey HSD	kontrol	recovery 100 uL	-.12300	.15191	.703	-.5150	.2690
		recovery 500 uL	.06600	.16408	.915	-.3574	.4894
	recovery 100 uL	kontrol	.12300	.15191	.703	-.2690	.5150
		recovery 500 uL	.18900	.18605	.578	-.2911	.6691
	recovery 500 uL	kontrol	-.06600	.16408	.915	-.4894	.3574
		recovery 100 uL	-.18900	.18605	.578	-.6691	.2911
LSD	kontrol	recovery 100 uL	-.12300	.15191	.430	-.4450	.1990
		recovery 500 uL	.06600	.16408	.693	-.2818	.4138
	recovery 100 uL	kontrol	.12300	.15191	.430	-.1990	.4450
		recovery 500 uL	.18900	.18605	.325	-.2054	.5834
	recovery 500 uL	kontrol	-.06600	.16408	.693	-.4138	.2818
		recovery 100 uL	-.18900	.18605	.325	-.5834	.2054

Lampiran 14. Hasil Konformasi Molecular Docking

No.	Ligan	Konformasi	Skor energi ikatan (<i>Binding Energy</i>) (Kkl/mol)	Konformasi terbaik
1	Alkaloid lada	1	-4,88	Konformasi 7
		2	-5,68	
		3	-4,81	
		4	-5,12	
		5	-4,52	
		6	-4,83	
		7	-5,70	
		8	-5,20	
		9	-4,97	
		10	-5,01	
2	Doksepin (5EH)	1	-4,86	Konformasi 7
		2	-4,45	
		3	-4,18	
		4	-3,95	
		5	-3,94	
		6	-4,34	
		7	-5,02	
		8	-4,60	
		9	-4,61	
		10	-3,42	
3	Difenhidramin	1	-3,55	Konformasi 8
		2	-2,23	
		3	-2,95	
		4	-2,82	
		5	-2,46	
		6	-3,82	
		7	-2,71	
		8	-6,99	
		9	-2,93	
		10	-3,60	

Lampiran 15. Hasil Validasi *Autodock* Ligan Asli dengan reseptor H₁

```
#####
# If you used AutoDock Vina in your work, please cite:
#
# O. Trott, A. J. Olson,
# AutoDock Vina: improving the speed and accuracy of docking
# with a new scoring function, efficient optimization and
# multithreading, Journal of Computational Chemistry 31 (2010)
# 455-461
#
# DOI 10.1002/jcc.21334
#
# Please see http://vina.scripps.edu for more information.
#####

Detected 4 CPUs
Reading input ... done.
Setting up the scoring function ... done.
Analyzing the binding site ... done.
Using random seed: -245923268
Performing search ... done.
Refining results ... done.

mode |   affinity   | dist from best mode
      | (kcal/mol)  | rmsd l.b. | rmsd u.b.
-----+-----+-----+-----
  1   |    -6.6     |    0.000  |    0.000
  2   |    -5.7     |    2.380  |    4.775
  3   |    -5.6     |    1.723  |    2.999
  4   |    -5.5     |   17.799  |   20.495
  5   |    -5.3     |   17.320  |   19.113
  6   |    -5.2     |    4.499  |    6.282
  7   |    -5.1     |   20.032  |   22.501
  8   |    -5.0     |    2.379  |    5.459
  9   |    -5.0     |    2.044  |    3.328

Writing output ... done.
```



Fakultas Kedokteran dan Ilmu Kesehatan
Universitas Muhammadiyah Yogyakarta

**SURAT KETERANGAN
KELAYAKAN ETIKA PENELITIAN**

Nomor : 219/EP-FKIK-UMY/VI/2016

Komisi Etika Penelitian Fakultas Kedokteran dan Ilmu Kesehatan Universitas Muhammadiyah Yogyakarta yang terdiri atas :

1. Prof. dr.H. Djauhar Ismail, Sp.A(K)., Ph.D.
2. Prof.Dr.dr.H. Soewito A, Sp.THT-KL
3. drg. Ana Medawati, M.Kes
4. drh. Tri Wulandari, M.Kes
5. Dr. dr. Titiek Hidayati, M. Kes
6. Dr. dr. Tri Wahyuliati, Sp. S., M. Kes
7. Titih Huriah, Ns., M. Kep., Sp. Kom
8. Dr. drg. Tita Ratya Utari, Sp. Ort
9. Sabtanti Harimurti, Ph. D., Apt
10. Dr. dr. Arlina Dewi, MMR
11. Yuni Permatasari Istanti, S. Kep. Ns., Sp. KMB
12. Dra. Irma Risdiyana, Apt., MPH
13. dr. Inayati Habib, Sp. MK., M. Kes

Telah mengkaji permohonan kelayakan etika penelitian yang diajukan oleh :

Nama Peneliti : Ratih Dwi Amaliah
NIM : 20120350023
Judul Penelitian : Uji Aktivitas Antagonisme Piperin (Senyawa Aktif Piper nigrum Linn.) Pada Reseptor Histamin H₁ Otot Polos Ileum Marmut Terisolasi : Studi *In Vitro* dan *In Silico*
Pada Tanggal : 22 Juni 2016
Dengan Hasil : Layak Etik

Demikian surat keterangan ini diberikan untuk dapat digunakan sebagaimana mestinya.

Yogyakarta, 22 Juni 2016



Dr. dr. Titiek Hidayati, M. Kes

Kampus:

Jl. Lingkar Selatan, Tamantirto, Kasihan, Bantul, Yogyakarta 55183
Telp. (0274) 387656 ext. 213, 7491350 Fax. (0274) 387658

Muda mendunia