BAB V

KESIMPULAN DAN SARAN

A. Kesimpulan

Berdasarkan hasil penelitian yang telah dilakukan dapat dikesimpulan bahwa:

Pertama, kombinasi ekstrak etanolik daun kacang tanah (*Arachis hypogaea* L.) dan simvastatindapat meningkatkan kadar HDL dan menurunkan kadar LDL serum darah tikus putih jantan galur wistar yang diberi diet tinggi lemak.

Kedua, semua dosis kombinasi ekstrak etanolik daun kacang tanah (*Arachis hypogaea* L.) dan simvastatin tidak ada yang efektif dalam meningkatkan kadar dan menurunkan kadar LDL pada tikus putih jantan galur wistar yang diberi diet tinggi lemak. Semua dosis kombinasi ekstrak etanolik daun kacang tanah (*Arachis hypogaea* L.) dan simvastatin sebanding dengan simvastatin dalam meningkatkan kadar HDL dan menurunkan kadar LDL serum darah tikus putih jantan galur wistar yang diberi diet tinggi lemak.

B. Saran

Pertama, perlu dilakukan penelitian lanjutan mengenai fraksi teraktif yang dapat meningkatkan kadar HDL dan menurunkan kadar LDL.

Kedua, perlu dilakukan penelitian lebih lanjut dengan memperhatikan lama perlakuan dan variasi dosis yang lebih teliti.

Ketiga, perlu dilakukan penelitian lanjutan mengenai interaksi dari kombinasi ekstrak etanolik daun kacang tanah dan simvastatin.

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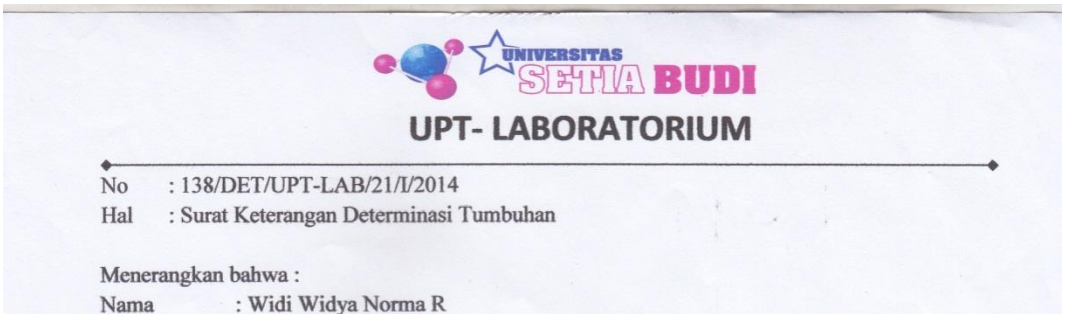
A M P I R A N

Lampiran 1. Hasil determinasi tanaman



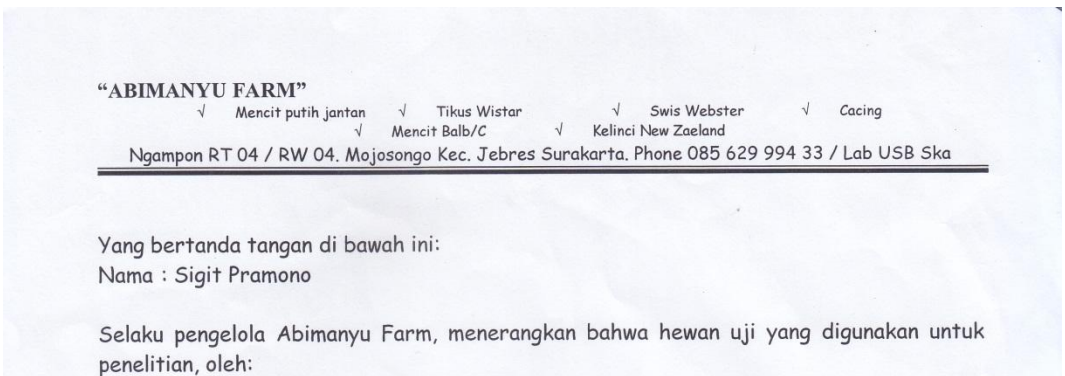
UNIVERSITAS SETIA BUDI

UPT- LABORATORIUM

No : 138/DET/UPT-LAB/21/I/2014
Hal : Surat Keterangan Determinasi Tumbuhan

Menerangkan bahwa :
Nama : Widi Widya Norma R

Lampiran 2. Surat keterangan pembelian hewan uji



"ABIMANYU FARM"

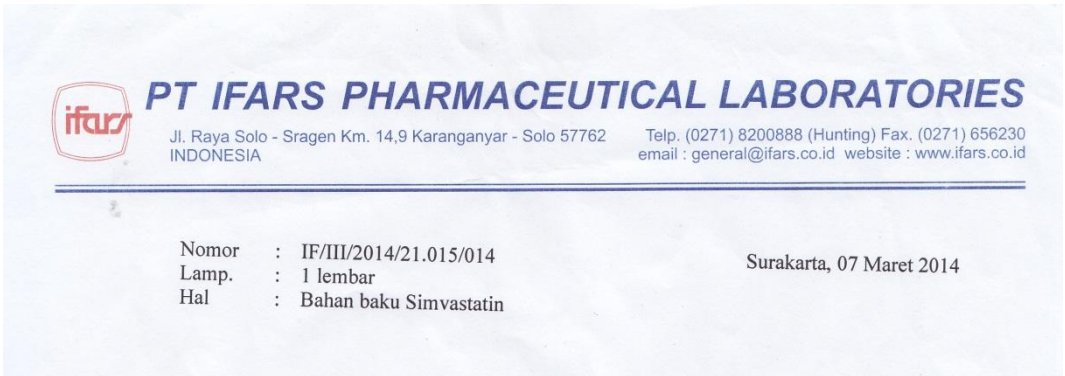
√ Mencit putih jantan √ Tikus Wistar √ Swis Webster √ Cacing
√ Mencit Balb/C √ Kelinci New Zaeland

Ngampon RT 04 / RW 04. Mojosongo Kec. Jebres Surakarta. Phone 085 629 994 33 / Lab USB Ska

Yang bertanda tangan di bawah ini:
Nama : Sigit Pramono

Selaku pengelola Abimanyu Farm, menerangkan bahwa hewan uji yang digunakan untuk penelitian, oleh:

Lampiran 3. Surat keterangan pembelian simvastatin



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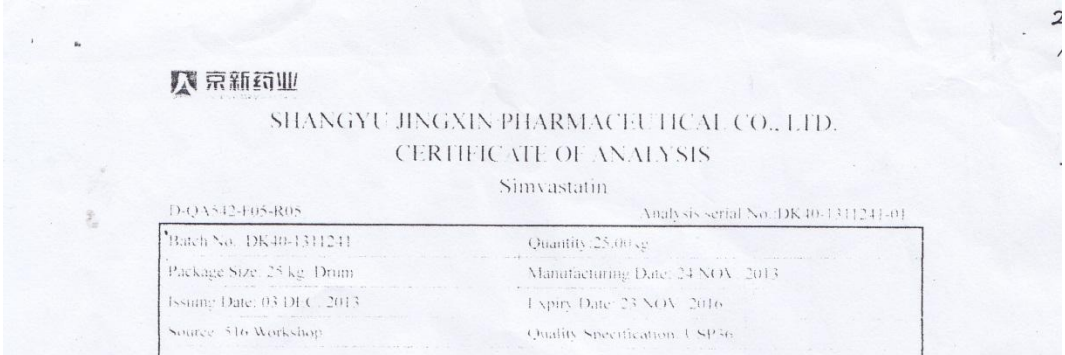
Nomor : IF/III/2014/21.015/014
Lamp. : 1 lembar
Hal : Bahan baku Simvastatin

Surakarta, 07 Maret 2014

Lampiran 4.Surat keterangan certificate of analysis simvastatin

Lampiran 4.Surat keterangan certificate of analysis simvastatin



京新药业

SHANGYU JINGXIN PHARMACEUTICAL CO., LTD.

CERTIFICATE OF ANALYSIS

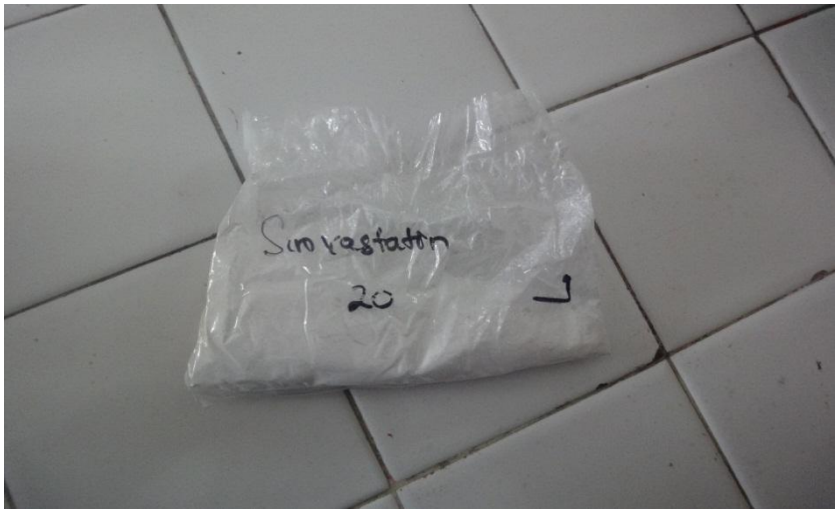
Simvastatin

D-QA542-F05-R05 Analysis serial No.:DK40-1311241-01

Batch No.: DK40-1311241	Quantity:25.00 kg
Package Size: 25 kg/ Drum	Manufacturing Date: 24 NOV. 2013
Issuing Date: 03 DEC. 2013	Expiry Date: 23 NOV. 2016
Source: 516 Workshop	Quality Specification: USP36

Lampiran 5. Foto tanaman kacang tanah dan serbuk daun kacang tanah dan serbuk simvastatin

A. Tanaman kacang tanah **B. Serbuk daun kacang tanah**



C. Serbuk simvastatin

Lampiran 6. Foto alat pembuatan ekstrak etanol daun kacang tanah

A. Botol maserasi **B.Corong Bucher**

C. Waterbat

D. Moisture balance

E. Ekstrak kental daun kacang tanah

F. Sediaan uji

G. Penggiling

Lampiran 7. Foto pemberian oral dan pengambilan sampel darah hewan uji

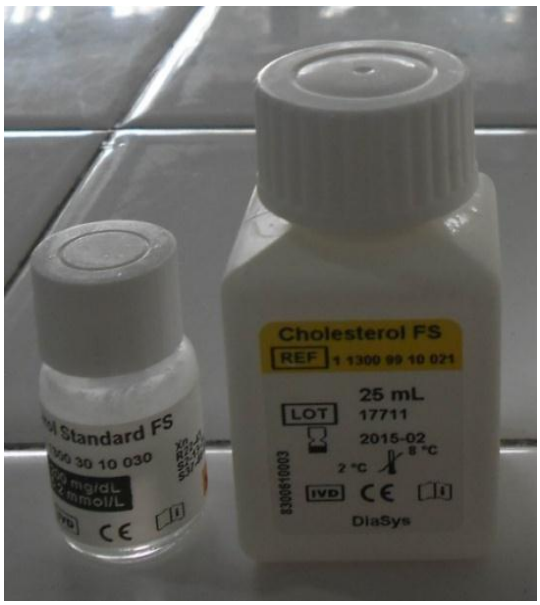
A. Pemberian oral

B.Pengambilan darah

Lampiran 8. Foto reagen dan alat penetapan kadar HDL dan LDL

A. Reagen LDL

B. Reagen HDL

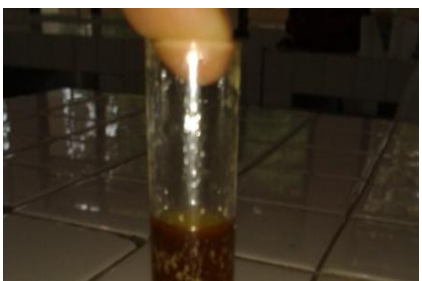


C. Reagen Kolesterol kit

D. Alat Centrifuge

E. Fotometer

Lampiran 9. Hasil identifikasi kandungan kimia ekstrak daun kacang tanah



A. Saponin **B. Flavonoid**

A. Saponin **B. Flavonoid**

C. Polifenol

Lampiran 10. Perhitungan rendemen berat kering terhadap berat basah

Berat basah (g)	Berat kering (g)	Rendemen (%)

4000	700	17,5

$$\% \text{ Rendemen} = \frac{\text{berat kering (g)}}{\text{berat basah (g)}} \times 100\%$$
$$= \frac{700\ g}{4000\ g} \times 100\%$$
$$= 17{,}5\%$$

Lampiran 11. Perhitungan susut pengeringan serbuk daun kacang tanah

Hasil susut pengeringan serbuk daun kacang tanah

No	Berat serbuk (g)	Kadar (%)
1	2	7
2	2	7,5
3	2	7,5
	Rata-rata	7,33

rata-rata kadar susut pengeringan = $\frac{7+7,5+7,5}{3}$

$=7,33\% < 10\%$

Jadi rata-rata kadar susut pengeringan serbuk daun kacang tanah adalah 7,33% yang berarti kurang dari 10%.

Hasil susut pengeringan ekstrak etanolik daun kacang tanah

No	Berat ekstrak (g)	Kadar (%)
1	2	2,0
2	2	2,5
3	2	2,5
	Rata-rata	2,3

rata-rata kadar susut pengeringan = $\frac{2+2,5+2,5}{3}$

$=2,3\% < 10\%$

Lampiran 12. Hasil rendemen ekstrak etanolik daun kacang tanah

Hasil rendemen ekstrak etanolik daun kacang tanah

Serbuk (g)	Wadah kosong (g)	Wadah+ ekstrak (g)	Ekstrak (g)	Rendemen (%)
600	160	330	170	28,33

% Rendemen $= \frac{\text{berat ekstrak (g)}}{\text{berat serbuk (g)}} \times 100\%$

$= \frac{170\text{g}}{600\text{ g}} \times 100\%$

$= 28{,}33\%$

Jadi rendemen ekstrak etanolik terhadap berat serbuk daun kacang tanah adalah 28,33%

Lampiran 13.Data pengukuran berat badan

Kelompok	No	Hari ke – 0 (gram)	Hari ke – 14 (gram)	Hari ke – 28 (gram)

I	1	170	195	180
	2	180	200	190
	3	185	200	180
	4	170	200	185
	5	175	200	180
Rata-rata		176	199	183
II	1	170	200	185
	2	175	190	185
	3	175	195	175
	4	180	210	200
	5	185	200	195
Rata-rata		177	199	188
III	1	185	195	190
	2	170	210	200
	3	180	200	190
	4	175	200	180
	5	180	190	185
Rata-rata		178	199	189
IV	1	180	195	190
	2	175	210	200
	3	185	200	190
	4	180	200	185
	5	175	195	175
Rata-rata		179	200	188
V	1	180	210	200
	2	180	190	185
	3	190	200	185
	4	185	200	190
	5	180	200	195
Rata-rata		183	200	191
VI	1	175	190	175
	2	175	200	190
	3	180	200	185
	4	180	190	180
	5	180	210	205
Rata-rata		178	198	187

Lampiran 14.Perhitungan dosis simvastatin, ekstrak dan sediaan kombinasi.

1. Pembuatan kontrol negatif

Larutan CMC 0,5 % = 0,5 g / 100 ml

= 500 mg /100 ml

Ditimbang 500 mg CMC dilarutkan dengan air suling ad 100 ml

2. Perhitungan dosis sediaan tunggal simvastatin

- Faktor konversi dari manusia (70 kg) ke tikus (200 g) adalah 0,018.

  Dosis simvastatin untuk manusia adalah 10 mg.

  Dosis untuk tikus 200 g = 10 x 0,018 = 0,18 mg/200 g BB tikus

- Larutan stok dibuat 0,018% = 0,018 g/100 ml = 0,18 mg/ml

  Cara pembuatanya : menimbang 0,018 g serbuk sivastatin lalu dicampur ke dalam suspensi CMC dan aquades hingga volume 100 ml.

- Volume pemberian = $\frac{0{,}18\ mg}{0{,}18 mmg}\ x\ 1\ ml = 1\ ml$

3. Perhitungan dosis sediaan ekstrak tunggal

- Penetapan dosis ekstrak daun kacang tanah dalam penelitian ini berdasarkan dosis efektif dari penelitian terdahulu, yaitu 17,28 mg/BB tikus (Mite 2013).

- Dibuat larutan stok 1% = 1g/100 ml

  = 100 mg/10 ml

  = 10 mg/1ml

- Volume pemberian = $\frac{17{,}28\ \text{mg}}{10\ \text{mg}}\ x\ 1\ ml$ = 1,7 ml

4. Perhitungan dosis kombinasi ekstrak-simvastatin 0,75:0,25

- Dosis ekstrak 0,75 = $\frac{75}{100}\ x\ 17{,}28\ mg = 12{,}96\ mg$

  Volume pemberian = $\frac{12{,}96\ \text{mg}}{10\ \text{mg}}\ x\ 1\ ml$ = 1,3 ml

- Dosis simvastatin 0,25 $= \frac{25}{100}\ x\ 0{,}1\ 8\ mg$ = 0,045 mg

  Volume pemberian $= \frac{0{,}045\ \text{mg}}{0{,}18\ \text{mg}}\ x\ 1\ ml$ = 0,25 ml

5. Perhitungan dosis kombinasi ekstrak-simvastatin 0,5:0,5

- Dosis ekstrak 0,5 $= \frac{50}{100}\ x\ 17{,}28\ mg = 8{,}64\ mg$

  Volume pemberian $= \frac{8{,}64\ mg\ \text{mg}}{10\ \text{mg}}\ x\ 1\ ml$ = 0,86 ml

- Dosis simvastatin 0,5 $= \frac{50}{100}\ x\ 0{,}1\ 8\ mg$ = 0,09 mg

  Volume pemberian $= \frac{0{,}09\ \text{mg}}{0{,}18\ \text{mg}}\ x\ 1\ ml$ = 0,5 ml

6. Perhitungan dosis kombinasi ekstrak-simvastatin 0,25:0,75

- Dosis ekstrak 0,25 $= \frac{25}{100}\ x\ 17{,}28\ mg = 4{,}32\ mg$

  Volume pemberian $= \frac{4{,}32\ \text{mg}}{10\ \text{mg}}\ x\ 1\ ml$ = 0,4 ml

- Dosis simvastatin 0,75 $= \frac{75}{100}\ x\ 0{,}1\ 8\ mg$ = 0,135 mg

  Volume pemberian $= \frac{0{,}135\ \text{mg}}{0{,}18\ \text{mg}}\ x\ 1\ ml$ = 0,75 ml

Kelompok	Tikus	Berat(g)	Volume pemberian (ml)	
			Ekstrak etanolik daun kacang tanah	Simvastatin
I	1	195	-	-
	2	200	-	-

	3	200	-	-
	4	200	-	-
	5	200	-	-
II	1	200	-	1
	2	190	-	0,95
	3	195	-	0,97
	4	210	-	1,05
	5	200	-	1
III	1	195	1,68	-
	2	210	1,8	-
	3	200	1,7	-
	4	200	1,7	-
	5	190	1,6	-
IV	1	195	1,26	0,24
	2	210	1,36	0,26
	3	200	1,3	0,25
	4	200	1.3	0,25
	5	195	1,26	0,24
V	1	210	0,9	0,52
	2	190	0,82	0,47
	3	200	0,86	0,5
	4	200	0,86	0,5
	5	200	0,86	0,5
VI	1	190	0,41	0,7
	2	200	0,43	0,75
	3	200	0,43	0,75
	4	190	0,41	0,7
	5	210	0,45	0,78

Lampiran 15. Rata-rata kadar HDL serum darah tikus

Kadar HDL serum darah tikus putih

Kelompok	No	Hari ke – 7 (mg/dl)	Hari ke – 14 (mg/dl)	Hari ke – 28 (mg/dl)
I	1	46,7	37,1	43,9
	2	49,5	36,6	40,2
	3	39,9	23,4	30,1
	4	47,5	35,2	41,0

	5	48,3	34,0	40,8
Rata-rata		46,4	33,3	39,2
II	1	45,3	35,3	59,0
	2	51,6	42,6	63,6
	3	45,4	38,9	68,8
	4	44,7	33,8	64,9
	5	39,3	22,8	59.4
Rata-rata		45,3	34,7	64,1
III	1	46,2	32,3	55,6
	2	40,4	30,9	52,8
	3	47,3	34,6	56,1
	4	57,0	35,0	55,7
	5	44,3	29,2	36,2
Rata-rata		47,0	32,0	51,3
IV	1	48,0	34,4	50,0
	2	43,8	30,0	56,2
	3	49,3	27,7	42,4
	4	55,0	39,5	65,9
	5	48,5	22,5	34,9
Rata-rata		48,9	30,8	49,9
V	1	38,9	27,2	55,6
	2	43,3	25,5	60,2
	3	46,1	32,2	50,0
	4	48,2	35,3	51,7
	5	58,2	42,8	60,4
Rata-rata		46,9	32,6	55,6
VI	1	46,7	37,1	65,0
	2	49,5	36,6	54,5
	3	39,9	23,4	55,8
	4	47,5	35,2	65,1
	5	48,3	34,0	64,6
Rata-rata		46,4	33,2	60,9

Lampiran 16. Perhitungan AUC kadar HDL

No	Kelompok	AUC hari ke 0-14	AUC hari ke 14-28
1	I	$AUC_0^{14} = \frac{(Cp\,0 + Cp\,14)(T14 - T0)}{2}$	$AUC_{14}^{28} = \frac{(Cp\,14 + Cp\,28)(T28 - T14)}{2}$
		$= \frac{(46{,}4 + 33{,}3)(14 - 0)}{2}$	$= \frac{(33{,}3 + 39{,}2)(28 - 14)}{2}$
		= 557,9	= 507,5
		AUC	1.065,4

2	II	$AUC_0^{14} = \frac{(Cp\,0 + Cp\,14)(T14 - T0)}{2}$ $= \frac{(45,3 + 34,7)(14 - 0)}{2}$ $= 560,0$	$AUC_{14}^{28} = \frac{(Cp\,14 + Cp\,28)(T28 - T14)}{2}$ $= \frac{(34,7 + 64,1)(28 - 14)}{2}$ $= 691,6$
		AUC	1.251,6
3	III	$AUC_0^{14} = \frac{(Cp\,0 + Cp\,14)(T14 - T0)}{2}$ $= \frac{(47,0 + 32,0)(14 - 0)}{2}$ $= 553,0$	$AUC_{14}^{28} = \frac{(Cp\,14 + Cp\,28)(T28 - T14)}{2}$ $= \frac{(32,0 + 51,3)(28 - 14)}{2}$ $= 583,1$
		AUC	1.136,1
4	IV	$AUC_0^{14} = \frac{(Cp\,0 + Cp\,14)(T14 - T0)}{2}$ $= \frac{(48,9 + 30,8)(14 - 0)}{2}$ $= 557,9$	$AUC_{14}^{28} = \frac{(Cp\,14 + Cp\,28)(T28 - T14)}{2}$ $= \frac{(30,8 + 49,9)(28 - 14)}{2}$ $= 564,9$
		AUC	1.122,9
5	V	$AUC_0^{14} = \frac{(Cp\,0 + Cp\,14)(T14 - T0)}{2}$ $= \frac{(46,9 + 32,6)(14 - 0)}{2}$ $= 556,5$	$AUC_{14}^{28} = \frac{(Cp\,14 + Cp\,28)(T28 - T14)}{2}$ $= \frac{(32,6 + 55,6)(28 - 14)}{2}$ $= 617,4$
		AUC	1.173,9

6	VI	$AUC_0^{14} = \frac{(Cp\,0+Cp\,14)(T14-T0)}{2}$ $= \frac{(46,4+33,2)(14-0)}{2}$ $= 557,2$	$AUC_{14}^{28} = \frac{(Cp\,14+Cp\,28)(T28-T14)}{2}$ $= \frac{(33,2+60,9)(28-14)}{2}$ $= 658,7$
		AUC	1.215,9

Lampiran 17. Hasil analisa statistik peningkatan kadar HDL serum darah (selisih/ T_{28}-T_{14}) dengan menggunakan uji *Kolmogorov-Smirnov* dan One *way* Anova

NPar Tests

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
PeningkatankadarHDL	30	20.513	9.1879	3.6	36.6

One-Sample Kolmogorov-Smirnov Test

		PeningkatankadarHDL
N		30
Normal Parameters[a,,b]	Mean	20.513
	Std. Deviation	9.1879
Most Extreme Differences	Absolute	.099
	Positive	.099
	Negative	-.099
Kolmogorov-Smirnov Z		.542
Asymp. Sig. (2-tailed)		.931

a. Test distribution is Normal.

b. Calculated from data.

Oneway

Descriptives

PeningkatankadarHDL

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	Minimum	Maximum

					Lower Bound	Upper Bound		
Kontrol Negatif	5	5.940	1.3740	.6145	4.234	7.646	3.6	6.8
Kontrol Positif	5	28.460	6.1970	2.7714	20.765	36.155	21.0	36.6
Ekstrak Tunggal	5	19.300	4.3342	1.9383	13.918	24.682	12.8	23.3
Kombinasi ekstrak-simvastatin (0,75:0,25)	5	19.060	6.7118	3.0016	10.726	27.394	12.4	26.4
Kombinasi ekstrak-simvastatin (0,5:0,5)	5	22.580	7.4520	3.3326	13.327	31.833	16.4	32.7
Kombinasi ekstrak-simvastatin (0,25:0,75)	5	27.740	5.7318	2.5633	20.623	34.857	17.9	32.4
Total	30	20.513	9.1879	1.6775	17.083	23.944	3.6	36.6

Test of Homogeneity of Variances

PeningkatankadarHDL

Levene Statistic	df1	df2	Sig.
3.292	5	24	.021

ANOVA

PeningkatankadarHDL

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1678.059	5	335.612	10.460	.000
Within Groups	770.036	24	32.085		
Total	2448.095	29			

Post Hoc Tests

Multiple Comparisons

PeningkatankadarHDL

Tukey HSD

(I) Kelompokperlakuan	(J) Kelompokperlakuan	Mean Difference (I-	Std. Error	Sig.	95% Confidence Interval

		J)			Lower Bound	Upper Bound
Kontrol Negatif	Kontrol Positif	-22.5200*	3.5824	.000	-33.597	-11.443
	Ekstrak Tunggal	-13.3600*	3.5824	.012	-24.437	-2.283
	Kombinasi ekstrak-simvastatin (0,75:0,25)	-13.1200*	3.5824	.014	-24.197	-2.043
	Kombinasi ekstrak-simvastatin (0,5:0,5)	-16.6400*	3.5824	.001	-27.717	-5.563
	Kombinasi ekstrak-simvastatin (0,25:0,75)	-21.8000*	3.5824	.000	-32.877	-10.723
Kontrol Positif	Kontrol Negatif	22.5200*	3.5824	.000	11.443	33.597
	Ekstrak Tunggal	9.1600	3.5824	.147	-1.917	20.237
	Kombinasi ekstrak-simvastatin (0,75:0,25)	9.4000	3.5824	.130	-1.677	20.477
	Kombinasi ekstrak-simvastatin (0,5:0,5)	5.8800	3.5824	.581	-5.197	16.957
	Kombinasi ekstrak-simvastatin (0,25:0,75)	.7200	3.5824	1.000	-10.357	11.797
Ekstrak Tunggal	Kontrol Negatif	13.3600*	3.5824	.012	2.283	24.437
	Kontrol Positif	-9.1600	3.5824	.147	-20.237	1.917
	Kombinasi ekstrak-simvastatin (0,75:0,25)	.2400	3.5824	1.000	-10.837	11.317
	Kombinasi ekstrak-simvastatin (0,5:0,5)	-3.2800	3.5824	.939	-14.357	7.797
	Kombinasi ekstrak-simvastatin (0,25:0,75)	-8.4400	3.5824	.211	-19.517	2.637
Kombinasi ekstrak-simvastatin (0,75:0,25)	Kontrol Negatif	13.1200*	3.5824	.014	2.043	24.197
	Kontrol Positif	-9.4000	3.5824	.130	-20.477	1.677
	Ekstrak Tunggal	-.2400	3.5824	1.000	-11.317	10.837

	Kombinasi ekstrak-simvastatin (0,5:0,5)	-3.5200	3.5824	.919	-14.597	7.557
	Kombinasi ekstrak-simvastatin (0,25:0,75)	-8.6800	3.5824	.188	-19.757	2.397
Kombinasi ekstrak-simvastatin (0,5:0,5)	Kontrol Negatif	16.6400*	3.5824	.001	5.563	27.717
	Kontrol Positif	-5.8800	3.5824	.581	-16.957	5.197
	Ekstrak Tunggal	3.2800	3.5824	.939	-7.797	14.357
	Kombinasi ekstrak-simvastatin (0,75:0,25)	3.5200	3.5824	.919	-7.557	14.597
	Kombinasi ekstrak-simvastatin (0,25:0,75)	-5.1600	3.5824	.703	-16.237	5.917
Kombinasi ekstrak-simvastatin (0,25:0,75)	Kontrol Negatif	21.8000*	3.5824	.000	10.723	32.877
	Kontrol Positif	-.7200	3.5824	1.000	-11.797	10.357
	Ekstrak Tunggal	8.4400	3.5824	.211	-2.637	19.517
	Kombinasi ekstrak-simvastatin (0,75:0,25)	8.6800	3.5824	.188	-2.397	19.757
	Kombinasi ekstrak-simvastatin (0,5:0,5)	5.1600	3.5824	.703	-5.917	16.237

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

Homogeneous Subsets

PeningkatankadarHDL

Tukey HSD[a]

		Subset for alpha = 0.05	
Kelompokperlakuan	N	1	2

Kontrol Negatif	5	5.940	
Kombinasi ekstrak-simvastatin (0,75:0,25)	5		19.060
Ekstrak Tunggal	5		19.300
Kombinasi ekstrak-simvastatin (0,5:0,5)	5		22.580
Kombinasi ekstrak-simvastatin (0,25:0,75)	5		27.740
Kontrol Positif	5		28.460
Sig.		1.000	.130

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 5,000.

Lampiran 18.Rata-rata kadar LDL serum darah tikus

Kadar LDL serum darah tikus putih

Kelompok	No	Hari ke – 7 (mg/dl)	Hari ke – 14 (mg/dl)	Hari ke – 28 (mg/dl)
Kontrol Negatif	1	49,7-14,3=35,4	139,0-45,2=94,7	133,2-43,0=90,2
	2	62,2-17,0=45,2	148,4-40,5=107,9	120,8-15,4=105,4

	3	54,5-15,4=39,1	149,3-46,8=102,5	143,4-43,9=99,5
	4	56,0-16,0=46,0	164,8-58,2=106,6	152,3-50,2=102,1
	5	62,7-19,8=42,9	126,0-20,1=105,9	114,0-13,2=100,8
Rata-rata		41,7	103.5	99,6
Kontrol Positif	1	57,8-14,5=43,3	145,8-43,0=102,8	49,4-9,7=39,7
	2	60,3-16,6=43,7	159,6-52,5=107,1	59,8-10.5=49,3
	3	54,7-18,3=36,4	138,6-35,0=103,6	47,2-10,9=36,3
	4	59,1-14,9=44,2	147,1-45,8=101,3	44,4-9,2=35,2
	5	39,3-11,1=28,2	128,4-35,6=92,8	51,6-9,8=41,8
Rata-rata		39,2	101,5	40,5
Dosis Tunggal	1	62,1-13,7=48,4	142,2-33,3=108,9	63,8- 10,2=53,6
	2	61,1-22,0=39,8	146,7-50,8=95,9	66,7- 28,9=37,8
	3	44,4-18,6=25,8	116,0-26,1=89,9	57,8-13,3=44,5
	4	55,7-19,2=36,5	124,4-45,2=79,2	53,6-10,4=43,2
	5	38,7-12,8=25,9	151,8-61,0=90,8	86,5-12,2 =74,3
Rata-rata		35,3	92,9	50,1
Kombinasi 75:25	1	47,0-14,7=32,3	162,2-48,1=114,1	73,7-6,3=67,4
	2	68,4-18,1=50,3	112,8-39,5=71,7	54,1-11,1=43,0
	3	54,2-11,7=42,5	147,0-37,8=109,2	84,9-21,4=63,5
	4	54,9-10,4=44,5	130,5-35,8=94,7	61,1-7,7=53,4
	5	40,1-10,0=20,1	138,3-45,8=92,5	68,0-17,4=50,6
Rata-rata		37,9	96,4	55,8
Kombinasi 50:50	1	59,5-13,9=45,6	139,3-42,7=96,6	66,8-20,5=46,3
	2	48,3-11,0=37,3	148,8-46,5=102,3	87,9-28,2=59,7
	3	52,7-17.5=35,2	167,7-72,9=94,8	85,3-24,0=41,3
	4	47,2-15,4=31,8	113,8-29,6=94,2	55,1-12,5=42,6
	5	47,6-18,2=29,4	133,6-49,0=84,6	50,7-15,4=35,3
Rata-rata		35,9	94,5	45,0

Kombinasi 25:75	1	61,8-15,4=46,4	150,8-64,1=86,7	58,6-19,0=48,6
	2	53,8-12,0=41,8	161,1-56,4=104,7	62,7-22,5=40,2
	3	42,1-10,8=31,3	122,4-34,8=87,6	50,1-19,0=31,1
	4	56,7-16,3=40,4	119,6-30,7=88,9	77,2 -25,0=52,2
	5	52,8-14,6=38,2	142,4-32,6=109,8	55,8-9,1=46,7
		39,6	95,5	43,8

Lampiran 19. Perhitungan AUC kadar LDL

No.	Kelompok	AUC hari ke 0-14	AUC hari ke 14-28
1	I	$AUC_0^{14} = \frac{(Cp\,0+Cp\,14)(T14-T0)}{2}$	$AUC_{14}^{28} = \frac{(Cp\,14+Cp\,28)(T28-T14)}{2}$
		$= \frac{(41,7+103,5)(14-0)}{2}$	$= \frac{(103,5+99,6)(28-14)}{2}$
		= 1.016,4	= 1.421,7

		AUC	2.438,1
2	II	$AUC_0^{14} = \frac{(Cp\,0 + Cp\,14)(T14 - T0)}{2}$ $= \frac{(39,2 + 101,5)(14 - 0)}{2}$ = 984,9	$AUC_{14}^{28} = \frac{(Cp\,14 + Cp\,28)(T28 - T14)}{2}$ $= \frac{(101,5 + 40,5)(28 - 14)}{2}$ = 994,0
		AUC	1.978,9
3	III	$AUC_0^{14} = \frac{(Cp\,0 + Cp\,14)(T14 - T0)}{2}$ $= \frac{(35,3 + 92,9)(14 - 0)}{2}$ = 897,4	$AUC_{14}^{28} = \frac{(Cp\,14 + Cp\,28)(T28 - T14)}{2}$ $= \frac{(92,9 + 50,1)(28 - 14)}{2}$ = 1.001,0
		AUC	1.898,4
4	IV	$AUC_0^{14} = \frac{(Cp\,0 + Cp\,14)(T14 - T0)}{2}$ $= \frac{(37,9 + 96,4)\,(14 - 0)}{2}$ = 940,1	$AUC_{14}^{28} = \frac{(Cp\,14 + Cp\,28)(T28 - T14)}{2}$ $= \frac{(96,4 + 55,8)(28 - 14)}{2}$ = 1.065,4
		AUC	2.005,5
5	V	$AUC_0^{14} = \frac{(Cp\,0 + Cp\,14)(T14 - T0)}{2}$ $= \frac{(35,9 + 94,5)(14 - 0)}{2}$ = 912,8	$AUC_{14}^{28} = \frac{(Cp\,14 + Cp\,28)(T28 - T14)}{2}$ $= \frac{(94,5 + 45,0)(28 - 14)}{2}$ = 974,5
		AUC	1.889,3

6	VI	$AUC_0^{14} = \frac{(Cp\,0+Cp\,14)(T14-T0)}{2}$ $= \frac{(39,6+95,5)(14-0)}{2}$ = 945,7	$AUC_{14}^{28} = \frac{(Cp\,14+Cp\,28)(T28-T14)}{2}$ $= \frac{(95,5+43,8)(28-14)}{2}$ = 975,1
		AUC	1.920,8

Lampiran 20. Hasil analisa statistik penurunan kadar LDL serum darah (selisih/ (T_{14}-T_{28})dengan menggunakan uji *Kolmogorov-Smirnov* dan One *way* Anova

NPar Tests

Descriptive Statistics

	N	Mean	Std. Deviation	Minimum	Maximum
penurunankadarLDL	30	42.277	20.4726	2.5	67.3

One-Sample Kolmogorov-Smirnov Test

		penurunankadar LDL
N		30
Normal Parameters[a,,b]	Mean	42.277
	Std. Deviation	20.4726
Most Extreme Differences	Absolute	.180
	Positive	.132
	Negative	-.180
Kolmogorov-Smirnov Z		.984
Asymp. Sig. (2-tailed)		.288

a. Test distribution is Normal.

b. Calculated from data.

Oneway

Descriptives

penurunankadarLDL

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	Minimum	Maximum

					Lower Bound	Upper Bound		
Kontrol Negatif	5	3.920	1.1100	.4964	2.542	5.298	2.5	5.1
Kontrol Positif	5	60.900	6.6630	2.9798	52.627	69.173	51.0	67.3
Ekstrak Tunggal	5	44.060	17.7122	7.9211	22.067	66.053	16.5	58.1
Kombinasi ekstrak-simvastatin (0,75:0,25)	5	42.920	3.3380	1.4928	38.775	47.065	39.1	46.7
Kombinasi ekstrak-simvastatin (0,5:0,5)	5	50.080	4.5174	2.0202	44.471	55.689	42.6	53.6
Kombinasi eksrak-simvastatin (0,25:0,75)	5	51.780	13.4793	6.0281	35.043	68.517	36.7	64.5
Total	30	42.277	20.4726	3.7378	34.632	49.921	2.5	67.3

Test of Homogeneity of Variances

penurunankadarLDL

Levene Statistic	df1	df2	Sig.
8.901	5	24	.000

ANOVA

penurunankadarLDL

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	9864.310	5	1972.862	20.673	.000
Within Groups	2290.364	24	95.432		
Total	12154.674	29			

Post Hoc Tests

Multiple Comparisons

penurunankadarLDL

Tukey HSD

(I) Kelompokperlakuan	(J) Kelompokperlakuan	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Kontrol Negatif	Kontrol Positif	-56.9800*	6.1784	.000	-76.083	-37.877
	Ekstrak Tunggal	-40.1400*	6.1784	.000	-59.243	-21.037
	Kombinasi ekstrak-simvastatin (0,75:0,25)	-39.0000*	6.1784	.000	-58.103	-19.897
	Kombinasi ekstrak-simvastatin (0,5:0,5)	-46.1600*	6.1784	.000	-65.263	-27.057
	Kombinasi eksrak-simvastatin (0,25:0,75)	-47.8600*	6.1784	.000	-66.963	-28.757
Kontrol Positif	Kontrol Negatif	56.9800*	6.1784	.000	37.877	76.083
	Ekstrak Tunggal	16.8400	6.1784	.107	-2.263	35.943
	Kombinasi ekstrak-simvastatin (0,75:0,25)	17.9800	6.1784	.073	-1.123	37.083
	Kombinasi ekstrak-simvastatin (0,5:0,5)	10.8200	6.1784	.514	-8.283	29.923
	Kombinasi eksrak-simvastatin (0,25:0,75)	9.1200	6.1784	.682	-9.983	28.223
Ekstrak Tunggal	Kontrol Negatif	40.1400*	6.1784	.000	21.037	59.243
	Kontrol Positif	-16.8400	6.1784	.107	-35.943	2.263
	Kombinasi ekstrak-simvastatin (0,75:0,25)	1.1400	6.1784	1.000	-17.963	20.243
	Kombinasi ekstrak-simvastatin (0,5:0,5)	-6.0200	6.1784	.922	-25.123	13.083
	Kombinasi eksrak-simvastatin (0,25:0,75)	-7.7200	6.1784	.808	-26.823	11.383
Kombinasi ekstrak-simvastatin (0,75:0,25)	Kontrol Negatif	39.0000*	6.1784	.000	19.897	58.103
	Kontrol Positif	-17.9800	6.1784	.073	-37.083	1.123
	Ekstrak Tunggal	-1.1400	6.1784	1.000	-20.243	17.963
	Kombinasi ekstrak-simvastatin (0,5:0,5)	-7.1600	6.1784	.851	-26.263	11.943
	Kombinasi eksrak-simvastatin (0,25:0,75)	-8.8600	6.1784	.707	-27.963	10.243

Kombinasi ekstrak-simvastatin (0,5:0,5)	Kontrol Negatif	46.1600*	6.1784	.000	27.057	65.263
	Kontrol Positif	-10.8200	6.1784	.514	-29.923	8.283
	Ekstrak Tunggal	6.0200	6.1784	.922	-13.083	25.123
	Kombinasi ekstrak-simvastatin (0,75:0,25)	7.1600	6.1784	.851	-11.943	26.263
	Kombinasi eksrak-simvastatin (0,25:0,75)	-1.7000	6.1784	1.000	-20.803	17.403
Kombinasi eksrak-simvastatin (0,25:0,75)	Kontrol Negatif	47.8600*	6.1784	.000	28.757	66.963
	Kontrol Positif	-9.1200	6.1784	.682	-28.223	9.983
	Ekstrak Tunggal	7.7200	6.1784	.808	-11.383	26.823
	Kombinasi ekstrak-simvastatin (0,75:0,25)	8.8600	6.1784	.707	-10.243	27.963
	Kombinasi ekstrak-simvastatin (0,5:0,5)	1.7000	6.1784	1.000	-17.403	20.803

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

Homogeneous Subsets

penurunankadarLDL

Tukey HSD[a]

Kelompokperlakuan	N	Subset for alpha = 0.05

		1	2
Kontrol Negatif	5	3.920	
Kombinasi ekstrak-simvastatin (0,75:0,25)	5		42.920
Ekstrak Tunggal	5		44.060
Kombinasi ekstrak-simvastatin (0,5:0,5)	5		50.080
Kombinasi eksrak-simvastatin (0,25:0,75)	5		51.780
Kontrol Positif	5		60.900
Sig.		1.000	.073

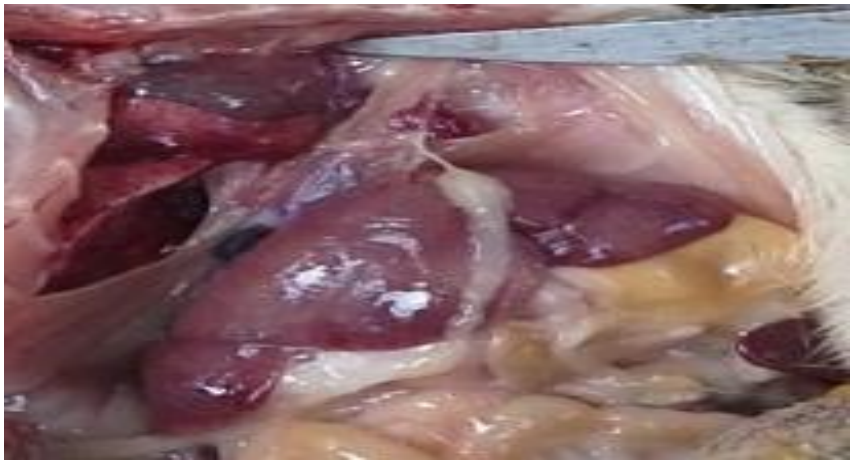
Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 5,000.

Lampiran 21. Hasil pembedahan tikus putih jantan

A. Kontrol negatif

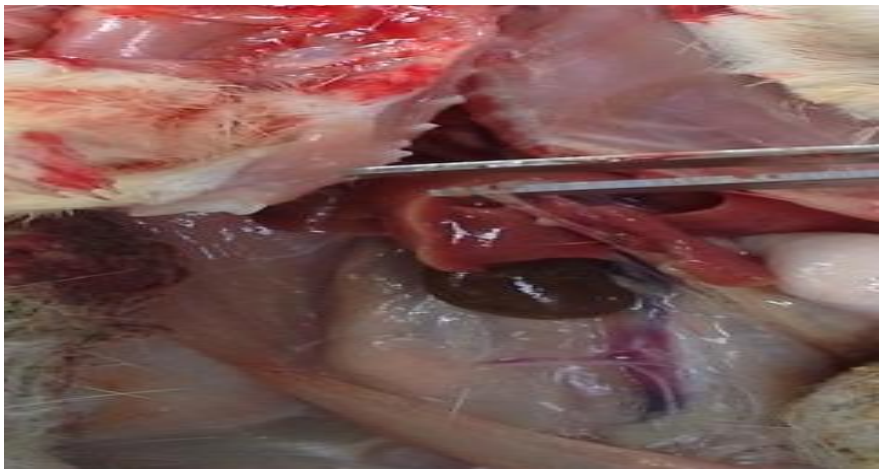
B. Kontrol positif



C. Ekstrak tungga

D. Kombinasi ekstrak-simvastatin 0,75:0,25

E. Kombinasi ekstrak-simvastatin 0,5:0,5



F. Kombinasi ekstrak-simvastatin 0,25:0,75

Lampiran 22. Prosedur reagen HDL

DiaSys
Diagnostic Systems

HDL Precipitant

Precipitation reagent for in vitro determination of high density lipoprotein cholesterol (HDL-C) according to the CHOD-PAP-method on photometric systems

Order Information

Cat. No.	Kit size
1 3540 99 90 885	250 mL Precipitation reagent
1 1350 99 10 021	R 5 x 25 mL + 1 x 3 mL Standard
1 1350 99 10 026	R 6 x 100 mL
1 1350 99 10 023	R 1 x 1000 mL
1 1300 99 10 030	6 x 3 mL Standard

Principle

Chylomicrons, VLDL and LDL are precipitated by adding phosphotungstic acid and magnesium ions to the sample. Centrifugation leaves only the HDL in the supernatant. Their cholesterol content is determined enzymatically using DiaSys Cholesterol FS.

Reagents

Componentes and concentrations

Phospotungstic acid	1.4 mmol/L
Magnesium chloride	8.6 mmol/L

Storage instructions and reagent stability

The reagent is stable up to the end of the indicated month of expiry, if stored at 15 – 25 °C and contamination is avoided.

Warnings and precautions

1. In very rare cases, samples of patients with gammopathy might give falsified results.
2. Please refer to the safety data sheets and take the necessary precautions for the use of laboratory reagents. For diagnostic purposes, the results should always be assessed with the patient`s medical history, clinical examinations and other findings.

Waste management

Please refer to local legal requirements.

Reagent Preparation

The precipitant is ready to use.

Material required but not provided

NaCl-Solution 9 g/L
General laboratory equipment

Specimen

Serum, heparin plasma or EDTA plasma

Stability [5]:	2 days	at	20 - 25 °C
	7 days	at	4 – 8 °C
	3 months	at	-20 °C

Freeze only once!
Discard contaminated specimens!

Assay procedure

Precipitation

Sample/Standard	200 µL
Precipitation reagent	500 µL

Mix and incubate for 15 min. at room temperature, then centrifuge for 20 min at 2500 g. Within 2 hours after centrifugation transfer 0.1 mL of the clear supernatant to the reaction solution for the determination of cholesterol.

After centrifugation, the supernatant should be clear. Serum or plasma with triglyceride contents > 1000 mg/dL tends to produce turbid supernatants or floating precipitates. In this case dilute the sample 1 + 1 with NaCl solution (9 g/L) and then perform the precipitation. Multiply the result by 2.

Cholesterol determination

Wavelength	500 nm, Hg 546 nm
Optical path	1 cm
Temperature	20 - 25 °C, 37 °C
Measurement	Against reagent blank

	Standard	Sample
Supernatant	-	100 µL
Standard	100 µL	-
Cholesterol reagent	1000 µL	1000 µL

Mix and incubate for 10 min at room temperature or 5 min at 37 °C. Then measure the absorbance of the sample or the standard against the reagent blank value within 45 min.

Calculation

With Standard

$$\text{HDL – Cholesterol [mg / dL]} = \frac{\Delta A\ \text{Sample}}{\Delta A\ \text{Standard}} \times \text{Conc. Standard [mg / dL]}$$

The concentration of the standard is the concentration of the total cholesterol in the cholesterol standard solution.

Conversion factor

Cholesterol [mg/dL] x 0.02586 = Cholesterol [mmol/L]

Controls

For internal quality control DiaSys TruLab N and P or TruLab L controls should be assayed. Each laboratory should establish corrective action in case of deviations in control recovery.

	Cat. No.	Kit size
TruLab N	5 9000 99 10 062	20 x 5 mL
	5 9000 99 10 061	6 x 5 mL
TruLab P	5 9050 99 10 062	20 x 5 mL
	5 9050 99 10 061	6 x 5 mL
TruLab L	5 9020 99 10 065	3 x 3 mL

Lampiran 23. Prosedur reagen LDL

CE

LDL Precipitant

Precipitation reagent for in vitro determination of LDL-Cholesterol with the CHOD-PAP method by photometric systems

Order Information

Cat. No.	Kit size
1 4330 99 83 885	250 mL Precipitation reagent
1 1350 99 83 021	R 5 x 25 mL + 1 x 3 mL Standard
1 1350 99 83 026	R 6 x 100 mL
1 1350 99 83 023	R 1 x 1000 mL
1 1300 99 83 030	6 x 3 mL Standard

Principle

Low density lipoproteins (LDL) are precipitated by addition of heparin. High density lipoproteins (HDL) and very low density lipoproteins (VLDL) remain in the supernatant after centrifugation and are measured enzymatically by the CHOD-PAP method. The concentration of LDL cholesterol is calculated as the difference of total cholesterol and cholesterol in the supernatant.

Reagents

Concentrations of the reagents

Heparin	100 000 U/L
Sodium citrate	64 mmol/L

Storage instructions and reagent stability

The precipitant is stable up to the end of the indicated month of expiry, if stored at 2 – 8 °C and contamination is avoided. The standard is stable up to the end of the indicated month of expiry, if stored at 2 – 25 °C.

Warnings and precautions

Please refer to the safety data sheets and take the necessary precautions for the use of laboratory reagents.

Waste management

Please refer to local legal requirements.

Reagent Preparation

The precipitant is ready to use.

Material required but not provided

NaCl-Solution 9 g/L
General laboratory equipment

Specimen

Serum

Stability [5]:	7 days	at	20 - 25 °C
	7 days	at	4 – 8 °C
	3 months	at	-20 °C

Discard contaminated specimens!

Assay procedure

Precipitation

Sample	100 µL
Precipitating reagent	1000 µL

Mix and incubate for 15 min. at room temperature, then centrifuge for 20 min. at 2500 g. Within one hour after centrifugation transfer of 100 µL of the clear supernatant to the reaction solution for the determination of cholesterol.

The cholesterol standard has to be diluted 1 + 10 with NaCl (9 g/L). After dilution the standard is treated like the supernatant.

Cholesterol determination

Wavelength	500 nm, Hg 546 nm
Optical path	1 cm
Temperature	20 - 25 °C, 37 °C
Measurement	Against reagent blank

	Standard	Sample
Supernatant	-	100 µL
Standard	100 µL	-
Cholesterol reagent	1000 µL	1000 µL

Mix and incubate 10 min. at room temperature or 5 min at 37 °C, read absorbance of the sample for the standard within 45 min. against reagent blank.

Calculation

Cholesterol in supernatant

$$\text{Cholesterol in supernatant [mg / dL]} = \frac{\Delta E \text{ Sample}}{\Delta E \text{ Standard}} \times \text{Conc.Standard[mg / dL]}$$

The standard concentration is the concentration of the total cholesterol in the cholesterol standard solution.

LDL Cholesterol

LDL-Cholesterol [mg/dL] =
total cholesterol [mg/dL] – Cholesterol in the supernatant [mg/dL]

Controls

For internal quality control TruLab N and P or TruLab L controls should be assayed with each batch of samples.

	Cat. No.	Kit size
TruLab N	5 9000 99 83 062	20 x 5 mL
	5 9000 99 83 061	6 x 5 mL
TruLab P	5 9050 99 83 062	20 x 5 mL
	5 9050 99 83 061	6 x 5 mL
TruLab L	5 9020 99 83 065	3 x 3 mL