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APPENDIX

APPENDIX A EVALUATION OF CELL VIABILITY OF SW480 AND FHC CELLS BY MTT ASSAY

Table 16 Effect of various concentrations of sericin on SW480 cell viability after incubation for 24 h.

Sericin concentration (μg/ml)	Cell viability (% of control)		
	Sericin A	Sericin B	Sericin C
0	91.67 ± 7.29	97.19 ± 5.62	105.04 ± 6.52
25	94.59 ± 1.84	98.89 ± 5.49	108.68 ± 2.86
50	91.08 ± 5.64	108.43 ± 10.55	103.55 ± 5.68
100	85.35 ± 2.60	111.28 ± 16.43	101.29 ± 6.49
200	90.62 ± 5.19	94.84 ± 13.13	87.93 ± 7.60
400	79.13 ± 7.00	87.81 ± 8.79	82.85 ± 7.46*
800	95.48 ± 11.55	87.71 ± 10.82	86.90 ± 12.01
1,600	88.22 ± 3.42	86.75 ± 7.72	80.21 ±9.38

Source: Values are mean ± SEM of 4 experiments

* $p \leq 0.05$, compared to control cells (PBS-treated cells)

Table 17 Effect of various concentrations of sericin on SW480 cell viability after incubation for 48 h

Sericin concentration (μg/ml)	Cell viability (% of control)		
	Sericin A	Sericin B	Sericin C
0	101.28 ± 3.95	103.33 ± 4.68	101.81 ± 2.18
25	99.84 ± 2.92	103.47 ± 5.90	97.84 ± 3.30
50	100.89 ± 3.96	91.35 ± 3.65	93.07 ± 3.16*
100	100.10 ± 7.32	89.63 ± 2.01*	87.89 ± 2.58*
200	106.33 ± 9.18	84.87 ± 2.43*	82.97 ± 5.41*
400	99.16 ± 10.31	80.80 ± 2.04*	77.98 ± 3.63*
800	97.09 ± 11.68	77.35 ± 7.28*	74.24 ± 2.65*
1,600	92.26 ± 9.52	77.30 ± 10.44*	70.96 ± 5.81*

Source: Values are mean ± SEM of 4 experiments

* $p \leq 0.05$, compared to control cells (PBS-treated cells)

Table 18 Effect of various concentrations of sericin on SW480 cell viability after incubation for 72 h

Sericin concentration (μg/ml)	Cell viability (% of control)		
	Sericin A	Sericin B	Sericin C
0	102.06 ± 5.18	96.27 ± 2.36	91.19 ± 3.79
25	88.96 ± 7.02	91.74 ± 4.82	89.76 ± 10.22
50	86.68 ± 10.67	89.52 ± 10.83	96.95 ± 6.61
100	84.55 ± 4.12*	81.98 ± 3.35*	84.79 ± 7.37
200	84.84 ± 4.03*	74.10 ± 5.53*	84.87 ± 8.21
400	80.34 ± 8.99*	73.59 ± 5.49*	71.20 ± 4.37*
800	64.80 ± 1.03*	70.22 ± 3.37*	68.98 ± 10.53
1,600	69.78 ± 6.08*	62.55 ± 6.71*	61.77 ± 6.35*

Source: Values are mean ± SEM of 4 experiments

* $p \leq 0.05$, compared to control cells (PBS-treated cells)

Table 19 Effect of various concentrations of sericin on FHC cell viability after incubation for 24 h

Sericin concentration (μg/ml)	Cell viability (% of control)		
	Sericin A	Sericin B	Sericin C
0	97.46 ± 0.46	105.97 ± 9.01	107.32 ± 3.10
25	90.05 ± 3.60	98.08 ± 2.21	93.23 ± 6.72
50	100.36 ± 6.25	99.30 ± 7.21	97.03 ± 14.16
100	102.07 ± 5.80	97.87 ± 14.76	84.89 ± 9.29*
200	95.33 ± 7.93	93.79 ± 14.93	88.35 ± 5.34*
400	89.88 ± 11.29	96.65 ± 15.78	84.32 ± 6.10*
800	89.51 ± 12.52	93.64 ± 13.51	85.40 ± 14.30
1600	86.23 ± 15.03	82.96 ± 8.75	83.33 ± 11.13

Source: Values are mean ± SEM of 4 experiments

* $p \leq 0.05$, compared to control cells (PBS-treated cells)

Table 20 Effect of various concentrations of sericin on FHC cell viability after incubation for 48 h

Sericin concentration (μg/ml)	Cell viability (% of control)		
	Sericin A	Sericin B	Sericin C
0	97.66 ± 1.00	93.35 ± 2.61	96.62 ± 1.64
25	87.83 ± 1.91*	84.89 ± 4.02*	85.22 ± 4.10*
50	90.73 ± 1.13*	85.75 ± 2.29*	88.48 ± 1.32*
100	89.50 ± 2.19*	82.60 ± 4.90*	84.61 ± 0.33*
200	89.69 ± 4.80	79.25 ± 2.18*	80.76 ± 2.64*
400	85.50 ± 4.90*	75.64 ± 4.24*	78.72 ± 2.11*
800	84.63 ± 3.94*	75.00 ± 5.30*	74.91 ± 4.67*
1600	86.25 ± 2.09*	74.92 ± 6.32*	73.43 ± 3.71*

Source: Values are mean ± SEM

* $p \leq 0.05$, compared to control cells (PBS-treated cells)

Table 21 Effect of various concentrations of sericin on FHC cell viability after incubation for 72 h

Sericin concentration (μg/ml)	Cell viability (% of control)		
	Sericin A	Sericin B	Sericin C
0	97.46 ± 0.46	94.01 ± 3.50	94.81 ± 3.70
25	84.89 ± 7.93	85.47 ± 7.39	84.66 ± 3.37
50	84.60 ± 9.37	81.73 ± 4.93	83.21 ± 4.59
100	80.50 ± 7.50*	75.24 ± 5.18*	79.77 ± 5.79
200	78.56 ± 7.46*	70.89 ± 1.85*	75.37 ± 8.65
400	76.86 ± 7.60*	67.59 ± 2.01*	70.95 ± 5.89*
800	80.51 ± 7.84	68.45 ± 1.59*	69.47 ± 4.93*
1600	81.16 ± 7.44	66.71 ± 1.97*	69.09 ± 4.42*

Source: Values are mean ± SEM

* $p \leq 0.05$, compared to control cells (PBS-treated cells)

APPENDIX B EVALUATION OF CELL APOPTOSIS OF SW480 AND FHC CELLS BY FLOW CYTOMETER

Table 22 Effect of various concentrations of sericin on SW480 cell apoptosis

Treatment	Percentage of cells		
	Early apoptosis	Late apoptosis	Necrosis
SW480 cells	2.72 ± 1.54	4.81 ± 1.27	2.38 ± 1.47
PBS	3.04 ± 2.47	5.85 ± 3.26	2.66 ± 2.05
Sericin A	1.37 ± 1.17	10.96 ± 2.38	3.12 ± 2.46
Sericin B	1.16 ± 0.98	10.83 ± 2.49*	2.44 ± 1.66
Sericin C	2.78 ± 1.36	5.92 ± 2.32*	2.44 ± 2.22

Source: Values are mean ± SD

* $p \leq 0.05$, compared to control cells (DMEM/F-12-treated cells)

Table 23 Effect of various concentrations of sericin on FHC cell apoptosis

Treatment	Percentage of cells		
	Early apoptosis	**Late apoptosis**	**Necrosis**
FHC cells	3.08 ± 1.83	2.84 ± 0.37	2.98 ± 2.20
PBS	3.30 ± 1.74	2.94 ± 0.38	2.83 ± 2.03
Sericin A	2.22 ± 1.37	2.24 ± 0.90	2.32 ± 1.68
Sericin B	2.33 ± 1.47	2.11 ± 0.83	2.75 ± 2.10
Sericin C	2.64 ± 1.43	2.27 ± 0.76	2.26 ± 1.43

Source: Values are mean ± SD

* $p \leq 0.05$, compared to control cells (DMEM/F-12-treated cells)

APPENDIX C EVALUATION OF CELL APOPTOSIS OF SW480 AND FHC CELLS BY CASPASE-3 ASSAY

Table 24 Effect of sericin on caspase-3 activity

Treatment	Caspase-3 activity (pmol AMC/min/mg protein)
SW480 cells	610.30 ± 132.21
PBS	604.35 ± 231.23
Sericin A	884.78 ± 491.51
Sericin B	1522.53 ± 296.52*
Sericin C	856.53 ± 211.30

Source: Values are mean ± SD

* $p \leq 0.05$, compared to control cells (DMEM/F-12-treated cells)

APPENDIX D EVALUATION OF CELL APOPTOSIS OF SW480 CELLS BY WESTERN BLOTTING

Table 25 Effect of sericin on Bcl-2 expression

Treatment	Density (% of control)
PBS	107.71 ± 19.02
Sericin A	90.97 ± 2.59
Sericin B	85.10 ± 9.68
Sericin C	82.27 ± 8.86*

Source: Values are mean ± SD

* $p \leq 0.05$, compared to control cells (PBS-treated cells)

Table 26 Effect of sericin Bax expression

Treatment	Density (% of control)
PBS	92.46 ± 9.02
Sericin A	90.20 ± 13.10
Sericin B	87.19 ± 16.37
Sericin C	90.43 ± 12.39

Source: Values are mean ± SD

APPENDIX D EVALUATION OF CELL CYCLE OF SW480 AND FHC CELLS BY FLOW CYTOMETER

Table 27 Effect of sericin on cell cycle of SW480 cells

Treatment	SW480 cells		
	G0/G1	S	G2/M
Untreated	60.46 ± 6.17	19.22 ± 6.33	16.49 ± 8.09
PBS	66.20 ± 2.67	13.54 ± 3.08	20.11 ± 5.90
Sericin A	67.91 ± 1.41	11.00 ± 2.13	20.21 ± 0.66
Sericin B	72.37 ± 5.58	11.11 ± 2.61	17.01 ± 5.09
Sericin C	68.65 ± 1.67	9.81 ± 4.57	18.95 ± 1.30

Source: Values are mean ± SD

Table 28 Effect of sericin on cell cycle of FHC cells

Treatment	FHC cells		
	G0/G1	S	G2/M
Untreated	69.79 ± 4.04	7.64 ± 1.01	17.08 ± 3.02
PBS	68.56 ± 5.12	7.90 ± 2.60	17.06 ± 3.72
Sericin A	67.23 ± 8.01	10.02 ± 1.57	15.02 ± 2.89
Sericin B	68.43 ± 8.10	10.24 ± 2.90	13.57 ± 1.32
Sericin C	71.51 ± 4.80	9.61 ± 0.37*	12.65 ± 4.36

Source: Values are mean ± SD

* $p \leq 0.05$, compared to control un-treated cells.

APPENDIX E CHEMOPREVENTIVE EFFECT OF SERICIN IN ANIMAL MODEL

Table 29 Effect of sericin on body weight

Month	Treatment				
	G1 Casein diet	G2 Sericin diet	G3 Casein diet + DMH	G4 Sericin diet + DMH	G5 Post sericin + DMH
1	237.38 ± 11.61	234.67 ± 30.53	228.54 ± 37.24	206.04 ± 25.24	229.00 ± 35.06
2	352.96 ± 18.86	336.92 ± 53.01	342.83 ± 42.14	339.54 ± 28.61	343.67 ± 45.30
3	425.88 ± 27.40	411.17 ± 35.07	423.04 ± 31.32	413.17 ± 26.64	405.83 ± 55.70
4	477.75 ± 29.36	455.83 ± 37.84	473.29 ± 29.85	458.85 ± 21.44	446.65 ± 50.64
5	502.75 ± 28.25	488.83 ± 40.81	498.08 ± 29.73	483.375 ± 24.84	486.83 ± 48.42

Source: Values are mean ± SD

Table 30 Effect of sericin on food consumption

Month	Treatment				
	G1 Casein diet	G2 Sericin diet	G3 Casein diet + DMH	G4 Sericin diet + DMH	G5 Post sericin + DMH
1	10.73 ± 2.76	12.52 ± 2.40	11.84 ± 2.70	8.41 ± 3.00	12.37 ± 2.80
2	17.90 ± 2.00	18.88 ± 2.30	19.07 ± 1.90	17.51 ± 3.40	17.78 ± 4.40
3	19.37 ± 0.90	20.10 ± 1.60	19.51 ± 0.90	21.97 ± 3.10	19.90 ± 1.90
4	21.59 ± 2.70	22.21 ± 1.60	24.62 ± 4.00	22.11 ± 1.20	21.89 ± 0.50
5	18.21 ± 0.90	19.37 ± 2.70	22.38 ± 2.70*	21.89 ± 2.70*	21.21 ± 1.00*

Source: Values are mean ± SD

* $p \leq 0.05$, compared to control casein diet (group 1)

Table 31 Effect of sericin on ACF formation

Treatment	No. of rats	Treatment				
		Proximal	Middle	Distal	Total ACF	Total ACF/cm^2
G3 Casein diet + DMH	1	0.00	11.00	9.00	20.00	26.14
	2	0.00	0.00	30.00	30.00	39.22
	3	9.00	9.00	27.00	45.00	58.82
	4	1.00	13.00	57.00	71.00	92.81
	5	0.00	49.00	73.00	122.00	159.48
	6	2.00	46.00	69.00	117.00	152.94
	Mean	3.00	29.25	56.50	88.75	116.01
	SD	4.08	21.17	20.81	37.12	48.52
G4 Sericin diet + DMH	1	0.00	2.00	55.00	57.00	74.51
	2	0.00	35.00	50.00	85.00	111.11
	3	0.00	18.00	36.00	54.00	70.59
	4	0.00	4.00	21.00	25.00	32.68
	5	0.00	7.00	77.00	84.00	109.80
	6	0.00	31.00	31.00	62.00	81.05
	Mean	0.00	16.20	45.00	61.17	79.96
	SD	0.00	14.20	20.00	22.21	29.04
G5 Post sericin + DMH	1	0.00	53.00	62.00	115.00	150.33
	2	0.00	5.00	51.00	56.00	73.20
	3	0.00	2.00	19.00	21.00	27.45
	4	0.00	1.00	56.00	57.00	74.51
	5	0.00	25.00	33.00	58.00	75.82
	6	0.00	45.00	26.00	71.00	92.81
	Mean	0.00	21.80	41.20	63.00	82.38
	SD	0.00	22.90	17.50	30.47	39.83

Table 32 Effect of sericin on distribution of ACF in proximal part of colon

Treatment	No. of rats	Distribution of crypt in ACF/cm^2				
		1	2	3	4	≥5
G3 Casein diet + DMH	1	0.00	0.00	0.00	0.00	0.00
	2	0.00	0.00	0.00	0.00	0.00
	3	1.00	3.00	2.50	1.00	1.50
	4	1.00	0.00	0.00	0.00	0.00
	5	0.00	0.00	0.00	0.00	0.00
	6	0.00	0.00	0.00	0.00	2.00
	Mean	0.50	0.75	0.63	0.25	0.88
	SD	0.58	1.50	1.25	0.50	1.03

Table 33 Effect of sericin on distribution of ACF in middle part of colon

Treatment	No. of rats	Distribution of crypt in ACF/cm^2				
		1	2	3	4	≥5
G3 Casein diet + DMH	1	0.00	3.90	2.60	0.00	5.19
	2	0.00	2.60	2.60	5.19	28.57
	3	1.30	7.79	1.30	1.30	23.38
	4	5.19	5.19	16.88	2.60	44.16
	5	3.90	24.68	11.69	16.88	37.66
	6	15.58	10.39	9.09	9.09	45.45
	Mean	6.49	12.01	9.74	7.47	37.66
	SD	6.27	8.70	6.49	7.14	10.12
G4 Sericin diet + DMH	1	0.00	5.19	6.49	3.90	55.84
	2	5.19	14.29	9.09	2.60	33.77
	3	14.29	10.39	6.49	3.90	7.79
	4	0.00	6.49	1.30	3.90	15.58
	5	16.88	32.47	19.48	6.49	24.68
	6	0.00	5.19	2.60	1.30	31.17
	Mean	6.06	12.34	7.58	3.68	28.14
	SD	7.69	10.48	6.49	1.73	16.69
G5 Post sericin + DMH	1	18.18	24.68	14.29	6.49	16.88
	2	9.09	9.09	22.08	3.90	22.08
	3	0.00	7.79	3.90	2.60	10.39
	4	2.60	12.99	5.19	14.29	37.66
	5	5.19	9.09	2.60	5.19	20.78
	6	0.00	3.90	9.09	0.00	20.78
	Mean	5.84	11.26	9.52	5.41	21.43
	SD	6.96	7.19	7.47	4.89	9.03

Table 34 Effect of sericin on distribution of ACF in distal part of colon

Treatment	No. of rats	Distribution of crypt in ACF/cm^2				
		1	2	3	4	≥5
G3 Casein diet + DMH	1	0.00	3.90	2.60	0.00	5.19
	2	0.00	2.60	2.60	5.19	28.57
	3	1.30	7.79	1.30	1.30	23.38
	4	5.19	5.19	16.88	2.60	44.16
	5	3.90	24.68	11.69	16.88	37.66
	6	15.58	10.39	9.09	9.09	45.45
	Mean	6.49	12.01	9.74	7.47	37.66
	SD	6.27	8.70	6.49	7.14	10.12
G4 Sericin diet + DMH	1	0.00	5.19	6.49	3.90	55.84
	2	5.19	14.29	9.09	2.60	33.77
	3	14.29	10.39	6.49	3.90	7.79
	4	0.00	6.49	1.30	3.90	15.58
	5	16.88	32.47	19.48	6.49	24.68
	6	0.00	5.19	2.60	1.30	31.17
	Mean	6.06	12.34	7.58	3.68	28.14
	SD	7.69	10.48	6.49	1.73	16.69
G5 Post sericin + DMH	1	18.18	24.68	14.29	6.49	16.88
	2	9.09	9.09	22.08	3.90	22.08
	3	0.00	7.79	3.90	2.60	10.39
	4	2.60	12.99	5.19	14.29	37.66
	5	5.19	9.09	2.60	5.19	20.78
	6	0.00	3.90	9.09	0.00	20.78
	Mean	5.84	11.26	9.52	5.41	21.43
	SD	6.96	7.19	7.47	4.89	9.03

Table 35 Effect of sericin on area of large size of ACF in middle part of colon

Treatment	No. of rats	Middle part of colon		
		Total ACF ≥ 5 crypts/focus	Total Size (mm^2)	Average size (mm^2)
G3 Casein diet + DMH	1	-	-	-
	2	-	-	-
	3	7.00	0.70	0.10
	4	0.00	0.00	0.00
	5	33.00	4.23	0.13
	6	14.00	2.10	0.15
	Total	54.00	7.03	0.38
	Mean	13.50	1.76	0.09
G4 Sericin diet + DMH	1	0.00	0.00	0.00
	2	17.00	2.11	0.12
	3	15.00	2.66	0.18
	4	2.00	0.38	0.19
	5	3.00	0.22	0.07
	6	0.00	0.00	0.00
	Total	37.00	5.37	0.56
	Mean	6.17	0.90	0.09
G5 Post sericin + DMH	1	20.00	2.17	0.11
	2	1.00	0.17	0.17
	3	1.00	0.09	0.09
	4	0.00	0.00	0.00
	5	10.00	1.25	0.13
	6	18.00	2.03	0.11
	Total	50.00	5.71	0.61
	Mean	8.33	0.95	0.10

Table 36 Effect of sericin on area of large size of ACF in distal part of colon

Treatment	No. of rats	Middle part of colon		
		Total ACF ≥ 5 crypts/focus	Total Size (mm^2)	Average size (mm^2)
G3 Casein diet + DMH	1	-	-	-
	2	-	-	-
	3	18.00	2.34	0.13
	4	34.00	4.44	0.13
	5	29.00	3.68	0.13
	6	35.00	5.29	0.16
	Total	116.00	15.75	0.55
	Mean	29.00	3.94	0.14
G4 Sericin diet + DMH	1	43.00	3.63	0.08
	2	26.00	2.77	0.11
	3	9.00	1.73	0.19
	4	12.00	1.33	0.11
	5	19.00	2.15	0.11
	6	24.00	2.39	0.09
	Total	133.00	14.00	0.70
	Mean	22.17	2.33	0.11
G5 Post sericin + DMH	1	13.00	1.95	0.15
	2	17.00	2.31	0.14
	3	8.00	1.25	0.16
	4	29.00	4.96	0.17
	5	16.00	1.91	0.12
	6	16.00	1.62	0.10
	Total	99.00	14.00	0.83
	Mean	16.50	2.33	0.14

Table 37 Effect of sericin on lipid peroxidation in control rats

Treatment	No. of rats	MDA concentration (μM)		
		Proximal	Middle	Distal
G1 Casein diet	1	1.26	0.78	1.14
	2	0.81	0.72	1.05
	3	1.51	1.08	1.69
	4	0.64	0.66	1.09
	5	0.00	0.79	0.59
	6	0.00	1.22	2.01
	Mean	1.06	0.88	1.26
	SD	0.04	0.22	0.51
G2 Sericin diet	1	1.41	0.69	0.61
	2	1.91	0.86	1.12
	3	0.53	0.72	1.02
	4	0.73	1.38	0.72
	5	1.60	1.00	0.64
	6	0.58	1.27	0.76
	Mean	1.13	0.99	0.81
	SD	0.59	0.29	0.21

Table 38 Effect of sericin on lipid peroxidation in DMH-treated rats

Treatment	No. of rats	MDA concentration (μM)		
		Proximal	Middle	Distal
G3 Casein diet + DMH	1	1.32	0.74	1.30
	2	0.80	0.35	3.98
	3	1.49	0.56	2.24
	4	0.57	0.87	1.87
	5	1.39	0.69	0.68
	6	0.82	0.00	0.56
	Mean	1.07	0.64	1.77
	SD	0.38	0.24	1.27
G4 Sericin diet + DMH	1	1.31	0.84	0.74
	2	0.00	1.52	2.35
	3	0.88	5.95	0.69
	4	1.17	2.89	0.70
	5	0.87	0.00	0.93
	6	0.00	0.00	0.00
	Mean	1.06	2.80	0.90
	SD	0.22	2.27	0.78
G5 Post sericin + DMH	1	1.51	1.72	2.02
	2	0.66	1.26	1.85
	3	1.33	1.13	1.13
	4	0.81	0.60	0.60
	5	0.44	1.08	0.63
	6	1.73	0.00	0.68
	Mean	1.08	1.16	1.15
	SD	0.52	0.40	0.64

Table 39 Effect of sericin on Ki67 proliferation marker

Proximal colon

Treatment	No. of rats	Total number of Ki67 positive cells			
		Basal zone	Transition zone	Surface zone	Total
G1 Casein diet	1	5.60	10.40	0.20	16.20
	2	10.40	10.60	0.20	21.20
	3	6.40	14.00	0.60	21.00
	4	11.60	18.00	0.80	30.40
	5	14.40	12.80	0.00	27.20
	6	18.40	16.80	5.00	40.20
	Mean	11.13	13.77	1.13	26.03
	SD	4.84	3.15	1.92	8.56
G2 Sericin diet	1	12.60	16.20	2.00	30.80
	2	10.40	13.80	0.40	24.60
	3	9.00	12.40	2.80	24.20
	4	6.40	13.40	3.40	23.20
	5	6.00	15.20	1.00	22.20
	6	10.40	24.20	6.40	41.00
	Mean	9.13	15.87	2.67	27.67
	SD	2.55	4.30	2.14	7.20

Table 39 (Cont.)

Treatment	No. of rats	Total number of Ki67 positive cells			
		Basal zone	Transition zone	Surface zone	Total
G3 Casein diet + DMH	1	12.80	10.40	1.20	24.40
	2	15.60	9.40	0.80	25.80
	3	19.80	16.60	3.00	39.40
	4	5.60	14.40	4.60	24.60
	5	9.20	17.40	2.40	29.00
	6	6.80	15.00	0.60	22.40
	Mean	11.63	13.87	2.10	27.60
	SD	5.47	3.27	1.54	6.18
G4 Sericin diet + DMH	1	6.40	15.80	4.60	26.80
	2	6.20	15.80	1.40	23.40
	3	5.00	20.40	5.00	30.40
	4	9.40	23.60	7.40	40.40
	5	10.20	16.40	2.80	29.40
	6	8.60	18.20	4.40	31.20
	Mean	7.63	18.37	4.27	30.27
	SD	2.06	3.12	2.04	5.72
G5 Post sericin + DMH	1	14.40	17.20	1.40	33.00
	2	6.00	18.20	0.80	25.00
	3	10.40	16.80	1.00	28.20
	4	10.40	16.80	1.00	28.20
	5	10.60	22.80	9.40	14.27
	6	13.40	21.00	2.60	37.00
	Mean	10.87	18.80	2.70	27.61
	SD	2.94	2.52	3.35	7.78

Table 40 Effect of sericin on Ki67 proliferation marker

Middle colon

Treatment	No. of rats	Total number of Ki67 positive cells			
		Basal zone	Transition zone	Surface zone	Total
G1 Casein diet	1	10.80	14.80	0.80	26.40
	2	14.00	14.60	0.40	27.40
	3	10.60	10.40	0.40	28.40
	4	10.80	23.80	5.80	29.40
	5	8.40	14.60	2.80	30.40
	6	17.60	17.00	0.80	31.40
	Mean	12.03	15.87	1.83	28.90
	SD	3.26	4.44	2.14	1.87
G2 Sericin diet	1	10.60	22.20	4.80	37.60
	2	14.40	13.00	1.20	28.60
	3	15.00	20.60	1.60	37.20
	4	11.00	21.40	2.20	34.60
	5	12.40	19.60	4.20	36.20
	6	11.00	20.60	5.00	36.60
	Mean	12.40	19.57	3.17	35.13
	SD	1.89	3.33	1.69	3.36

Table 40 (Cont.)

Treatment	No. of rats	Total number of Ki67 positive cells			
		Basal zone	Transition zone	Surface zone	Total
G3 Casein diet + DMH	1	5.20	13.60	3.80	22.60
	2	13.80	17.60	1.60	33.00
	3	12.60	17.80	3.80	34.20
	4	14.20	21.00	2.20	37.40
	5	12.40	21.00	2.60	36.00
	6	10.00	20.60	4.40	35.00
	Mean	11.37	18.60	3.07	33.03
	SD	3.36	2.90	1.09	5.33
G4 Sericin diet + DMH	1	5.40	19.20	5.60	30.20
	2	9.40	18.00	4.20	31.60
	3	22.00	21.00	5.40	48.40
	4	13.00	21.60	4.80	39.40
	5	12.40	21.00	2.60	36.00
	6	9.80	22.20	5.60	37.60
	Mean	12.00	20.50	4.70	37.20
	SD	5.59	1.58	1.16	6.52
G5 Post sericin + DMH	1	11.00	13.80	1.60	26.40
	2	18.80	9.20	0.20	28.20
	3	15.20	14.80	1.20	31.20
	4	11.80	16.80	5.60	34.20
	5	12.80	21.40	7.40	41.60
	6	20.40	9.00	0.80	30.20
	Mean	15.00	14.17	2.80	31.97
	SD	3.87	4.71	2.96	5.42

Table 41 Effect of sericin on Ki67 proliferation marker

Distal colon

Treatment	No. of rats	Total number of Ki67 positive cells			
		Basal zone	Transition zone	Surface zone	Total
G1 Casein diet	1	11.00	4.20	0.00	15.20
	2	15.40	7.60	0.20	17.60
	3	9.90	4.20	0.00	14.10
	4	12.80	4.40	0.20	17.40
	5	8.90	2.10	0.00	11.00
	6	11.80	7.60	0.00	19.40
	Mean	11.63	5.02	0.07	15.78
	SD	2.30	2.17	0.10	3.00
G2 Sericin diet	1	12.80	5.00	0.00	17.80
	2	19.60	2.60	0.00	20.00
	3	7.70	0.60	0.00	8.30
	4	13.90	7.40	0.30	21.60
	5	9.30	4.00	0.00	13.30
	6	21.00	7.50	0.00	28.50
	Mean	14.05	4.52	0.05	18.25
	SD	5.36	2.71	0.12	6.97

Table 41 (Cont.)

Treatment	No. of rats	Total number of Ki67 positive cells			
		Basal zone	Transition zone	Surface zone	Total
G3 Casein diet + DMH	1	Tumor			
	2	Tumor			
	3	11.60	5.20	0.00	16.80
	4	17.00	4.00	0.10	21.10
	5	8.90	2.10	0.00	11.00
	6	11.80	7.60	0.00	19.40
	Mean	12.33	4.73	0.03	17.08
	SD	3.39	2.30	0.05	4.42
G4 Sericin diet + DMH	1	16.30	6.00	0.60	22.90
	2	19.10	5.20	0.00	24.30
	3	15.40	7.90	0.20	23.50
	4	13.90	7.40	0.30	21.60
	5	18.10	10.60	1.60	30.30
	6	23.00	21.10	4.60	48.70
	Mean	17.63	9.70	1.22	28.55
	SD	3.22	5.89	1.75	10.32
G5 Post sericin + DMH	1	10.00	7.40	0.50	17.90
	2	19.60	11.20	0.90	31.70
	3	15.30	4.20	0.00	19.50
	4	14.80	13.00	3.10	30.90
	5	23.60	12.50	0.40	36.50
	6	22.70	16.80	2.90	42.40
	Mean	17.67	10.85	1.30	29.82
	SD	5.23	4.45	1.35	9.55

Table 42 Effect of sericin on length of colonic crypts

Proximal colon

Treatment	No. of rats	Total number of Ki67 positive cells		
		Total length	Ki67	Ratio Ki67/length
G1 Casein diet	1	191.97	113.06	0.59
	2	205.76	111.22	0.54
	3	232.19	146.17	0.62
	4	225.21	146.18	0.65
	5	212.82	121.04	0.57
	6	193.08	142.99	0.73
	Mean	210.17	130.11	0.62
	SD	16.50	16.80	0.07
G2 Sericin diet	1	218.67	155.08	0.70
	2	216.76	134.13	0.62
	3	202.47	147.91	0.74
	4	244.06	187.61	0.76
	5	220.12	158.05	0.72
	6	230.97	200.03	0.87
	Mean	222.18	163.80	0.73
	SD	14.08	24.99	0.08

Table 42 (Cont.)

Treatment	No. of rats	Total number of Ki67 positive cells		
		Total length	Ki67	Ratio Ki67/length
G3 Casein diet + DMH	1	251.02	170.81	0.69
	2	233.40	147.58	0.63
	3	250.72	194.08	0.77
	4	215.41	170.89	0.80
	5	237.24	166.49	0.71
	6	252.34	160.44	0.64
	Mean	240.02	168.38	0.71
	SD	14.45	15.31	0.07
G4 Sericin diet + DMH	1	340.40	263.24	0.77
	2	209.80	130.09	0.62
	3	320.80	257.13	0.80
	4	284.98	230.60	0.81
	5	216.23	158.98	0.72
	6	255.29	199.32	0.77
	Mean	271.25	206.56	0.75
	SD	53.82	53.87	0.07
G5 Post sericin + DMH	1	275.37	187.38	0.68
	2	211.70	143.44	0.68
	3	247.97	167.95	0.68
	4	247.97	167.95	0.68
	5	249.94	213.80	0.86
	6	337.53	239.25	0.71
	Mean	261.75	186.63	0.72
	SD	42.32	34.85	0.07

Table 43 Effect of sericin on length of colonic crypts

Middle colon

Treatment	No. of rats	Total number of Ki67 positive cells		
		Total length	Ki67	Ratio Ki67/length
G1 Casein diet	1	297.18	199.06	0.67
	2	311.00	194.29	0.62
	3	242.53	155.85	0.64
	4	227.25	189.75	0.83
	5	256.39	200.50	0.78
	6	275.60	194.78	0.71
	Mean	268.33	189.04	0.71
	SD	32.25	16.70	0.08
G2 Sericin diet	1	340.54	260.99	0.77
	2	283.84	180.95	0.64
	3	277.27	194.42	0.70
	4	327.26	257.25	0.79
	5	310.78	238.08	0.77
	6	328.77	254.23	0.77
	Mean	311.41	230.99	0.74
	SD	25.80	34.70	0.06

Table 43 (Cont.)

Treatment	No. of rats	Total number of Ki67 positive cells		
		Total length	Ki67	Ratio Ki67/length
G3 Casein diet + DMH	1	207.34	162.76	0.78
	2	298.43	216.53	0.73
	3	326.07	257.40	0.79
	4	260.08	193.55	0.74
	5	329.10	251.02	0.76
	6	301.28	241.72	0.80
	Mean	287.05	220.50	0.77
	SD	46.27	36.93	0.03
G4 Sericin diet + DMH	1	242.10	209.97	0.87
	2	373.11	309.77	0.83
	3	427.08	357.70	0.84
	4	323.68	260.97	0.81
	5	329.10	251.02	0.76
	6	329.60	290.36	0.88
	Mean	337.45	279.97	0.83
	SD	61.19	51.26	0.04
G5 Post sericin + DMH	1	349.25	238.71	0.68
	2	289.11	159.61	0.55
	3	314.14	214.74	0.68
	4	278.91	223.54	0.80
	5	289.31	269.45	0.93
	6	291.75	200.57	0.69
	Mean	302.08	217.77	0.72
	SD	25.87	36.96	0.13

Table 44 Effect of sericin on length of colonic crypts

Distal colon

Treatment	No. of rats	Total number of Ki67 positive cells		
		Total length	Ki67	Ratio Ki67/length
G1 Casein diet	1	177.50	78.67	0.44
	2	195.60	109.37	0.53
	3	270.35	122.75	0.46
	4	206.83	97.79	0.47
	5	222.16	87.49	0.39
	6	251.30	121.54	0.48
	Mean	220.62	102.93	0.46
	SD	34.90	18.08	0.05
G2 Sericin diet	1	199.75	95.50	0.48
	2	224.62	94.71	0.41
	3	203.52	69.61	0.35
	4	273.27	152.18	0.55
	5	269.94	132.78	0.50
	6	200.76	100.86	0.50
	Mean	228.64	107.61	0.47
	SD	34.51	29.74	0.08

Table 44 (Cont.)

Treatment	No. of rats	Total number of Ki67 positive cells		
		Total length	Ki67	Ratio Ki67/length
G3 Casein diet + DMH	1	Tumor	Tumor	Tumor
	2	Tumor	Tumor	Tumor
	3	219.73	108.02	0.49
	4	204.50	89.60	0.44
	5	222.16	87.49	0.39
	6	251.30	121.54	0.48
	Mean	224.42	101.66	0.45
	SD	19.55	16.14	0.05
G4 Sericin diet + DMH	1	171.92	108.48	0.63
	2	196.49	91.63	0.47
	3	227.40	135.24	0.60
	4	273.27	152.18	0.55
	5	264.24	182.72	0.70
	6	290.51	216.73	0.74
	Mean	237.30	147.83	0.62
	SD	46.67	46.58	0.10
G5 Post sericin + DMH	1	297.37	181.57	0.63
	2	258.65	163.39	0.64
	3	265.16	129.77	0.49
	4	263.98	205.95	0.75
	5	269.97	166.32	0.62
	6	265.39	197.70	0.74
	Mean	270.08	174.12	0.64
	SD	13.83	27.45	0.10

Table 45 Effect of sericin on complete blood count (CBC)

Treatment	WBC (10^3/μl)	RBC (10^3/μl)	NEUT (10^3/μl)	LYMPH (10^3/μl)
G1 Casein	2.71 ± 1.05	8.64 ± 0.60	0.34 ± 0.23	1.96 ± 0.84
G2 Sericin	2.46 ± 0.87	8.22 ± 0.55	0.53 ± 0.18	1.68 ± 0.67
G3 Casein + DMH	3.09 ± 1.15	8.57 ± 0.85	0.54 ± 0.42	2.16 ± 1.05
G4 Sericin + DMH	2.36 ± 0.55	8.05 ± 0.29	0.32 ± 0.38	1.50 ± 0.50
G5 Post-sericin + DMH	2.63 ± 0.96	6.67 ± 3.15	0.54 ± 0.31	1.71 ± 0.88

Source: Values are mean ± SD of 6 rats.

Table 46 Effect of sericin on complete blood count (CBC)

Treatment	MONO ($10^3/\mu l$)	EO ($10^3/\mu l$)	BASO ($10^3/\mu l$)
G1 Casein	0.20 ± 0.10	0.05 ± 0.02	0.02 ± 0.03
G2 Sericin	0.14 ± 0.05	0.10 ± 0.11	0.02 ± 0.02
G3 Casein + DMH	0.22 ± 0.14	0.07 ± 0.02	0.03 ± 0.04
G4 Sericin + DMH	0.13 ± 0.04	0.04 ± 0.03	0.07 ± 0.18
G5 Post-sericin + DMH	0.20 ± 0.20	0.11 ± 0.09	0.01 ± 0.03

Source: Values are mean ± SD of 6 rats.

Table 47 Cell surface markers in rats part I

Treatment	CD2	CD3	CD4
G1 Casein	63.59 ± 7.96	52.52 ± 9.44	44.45 ± 4.90
G2 Sericin	66.71 ± 17.18	56.95 ± 16.12	50.66 ± 24.36
G3 Casein + DMH	61.93 ± 6.69	56.20 ± 7.02	40.83 ± 8.20
G4 Sericin + DMH	76.09 ± 12.86	69.05 ± 11.83	54.47 ± 14.40
G5 Post-sericin + DMH	65.63 ± 21.20	56.02 ± 30.70	41.12 ± 22.34

Source: Values are mean ± SD of 6 rats.

Table 48 Cell surface markers in rats part II

Treatment	CD8a	CD11	CD25
G1 Casein	40.73 ± 8.98	96.37 ± 1.60	21.63 ± 3.38
G2 Sericin	25.25 ± 13.75	83.58 ± 34.14	18.33 ± 12.89
G3 Casein + DMH	28.60 ± 6.46	98.32 ± 0.51	23.18 ± 3.66
G4 Sericin + DMH	25.72 ± 4.88	98.74 ± 0.85	32.31 ± 3.84
G5 Post-sericin + DMH	24.03 ± 5.72	94.68 ± 6.26	24.47 ± 7.54

Source: Values are mean ± SD of 6 rats.

Table 49 Cell surface markers in rats part III

Treatment	CD45	CD54	CD80	CD86
G1 Casein	99.84 ± 0.18	74.98 ± 7.17	23.55 ± 8.24	20.08 ± 5.01
G2 Sericin	85.53 ± 22.24	68.32 ± 11.10	10.28 ± 5.74	29.13 ± 32.16
G3 Casein + DMH	99.66 ± 0.27	77.53 ± 2.99	20.98 ± 3.81	21.31 ± 5.39
G4 Sericin + DMH	99.74 ± 0.41	77.65 ± 9.21	17.15 ± 9.06	14.67 ± 5.23
G5 Post-sericin + DMH	99.20 ± 0.81	77.27 ± 3.44	24.02 ± 11.36	21.87 ± 11.86

Source: Values are mean ± SD of 6 rats.

BIOGRAPHY

BIOGRAPHY

Name – Surname	Waraporn Kaewkon
Date of Birth	November 19, 1978
Address	391 Moo 1, Kaewdamri Road, Pichai, Uttaradit, 53220
Work Experiences	
2007	Faculty of Medical Science, Naresuan University
2005	Lower North Veterinary Research and Development Center
Education Background	
2003	M.S. (Biology), Chiang Mai University, Chiang Mai, Thailand
2000	B.S. (Zoology), Chiang Mai University, Chiang Mai, Thailand