REFERENCES

Bajpai, A.K., and Sharma, M. (2005). Preparation and Characterization of Binary Grafted Polymeric Blends of Polyvinyl Alcohol and Gelatin and Evaluation of their Water Uptake Potential. Journal of Macromolecular Science. Part A : Pure and Applied Chemistry, 42, 663-682.

Barry AL. (1976). Agar dilution technique. In : Barry AL(ed). The antimicrobic susceptibility tests : Principles and practice. Lea and Febiqer, Philadelphia, 76-104.

Belalia, R., Gerlier, S., Benaissa, M., and Coma, V. (2008). New bioactive Biomaterials based on Quaternized Chitosan. Journal of Agricultural and Food Chemistry, 56, 1582-1588.

Benamer, S., Mahlous, M., Boukrif, B., and Youcef, S. L., Synthesis and characterization of hydrogels based on poly(vinyl pyrrolidone). Nuclear Instruments and Methods in Physics Research B. 248, 248-290.

Benesch, J., and Tengvall, P. (2002). Blood protein adsorption onto chitosan. Biomaterials, 23, 2561-2568.

Berger, J., Reist, M., Mayer, J.M., Felt, O., and Gurny, R. (2004). Structure and interactions in chitosan hydrogels formed by complexation or aggregation for biomedical applications. European Journal of Pharmaceutics and Biopharmaceutics, 57, 35-52.

Can, H.K., Denizli, B. K., Kavlak, S., and Guner, A. (2005). Preparation and swelling studies of biocompatible hydrogel systems by using gamma radiation-induced polymerization. Radiation Physics and Chemistry, 72, 483-488.

Chang, X., Xiao, L., and Du Y. (2009). Preparation and properties of a novel thermosensitive *N*-trimethyl chitosan hydrogel. Polymer Bulletin, 63, 531-545.

Chen, L., Tian, Z., and Du, Y. (2004). Synthesis and pH sensitivity of carboxmethyl chitosan-based polyampholyte hydrogels for protein carrier matrices. Biomaterial, 25, 3725-3732.

Chen, X.G., Park, H.J. (2003). Chemical characteristics of O-carboxymethyl chitosans related to the preparation conditions. Carbohydrate Polymer, 53, 355-359.

Chen, X.G., Wang, Z., Liu, W.S., and Park H.J. (2002). The effect of carboxymethyl-chitosan on proliferation and collagen secretion of normal and keloid skin fibroblasts. Biomaterials, 23, 4609-4614.

Chung, Y. C., Su, Y. P., Chen, C. C., Jia, G., Wang, H. L., Wu, J. C. J., and Lin, J. G. (2004). Relationship between antibacterial activity of chitosan ans surface characteristics of cell wall. Acta Phamacologica Sinica Chinese Phamhacological Society Shanghai Institue of Materia Medica Chinese Academy of Sciences, 7, 932-936.

Dhara, D., Nisha, C.K., and Chatterji, P.R. (1999). Super absorbent hydrogels : interpenetrating networks of poly(acrylamide-co-acrylic acid) and poly(vinyl alcohol) : swelling behavior and structural parameters. Pure and Applied Chemistry, 36, 197-210.

Domard, A., Rinaudo, M., and Terrassin, C. (1986). New method for the quaternization of chitosan. International Journal of Biological and Macromolecules, 8, 105-107.

Don, T. M., King, C. F., Chiu, W. Y., and Peng, C. A. (2006). Preparation and characterization of chitosan-g-poly(vinyl alcohol)/poly(vinyl alcohol) blends used for the evaluation of blood-contacting compatibility. Carbohydrate Polymer, 63, 331-339.

Francis, S., and Varshney, L. (2005). Studies on radiation synthesis of PVA/EDTA hydrogels. Radiation Physics and Chemistry, 74, 310-316.

Goy, R. C., Britto, D. D., and Assis, O. B. G. (2009). A review of the Antimicrobial Activity of Chitosan. Polimeros:Ciência e Tecnologia, 19, 241-247.

Gudeman, L.F., and Peppas, N.A. (1995). pH-Sensitive membrances from poly(vinyl alcohol)/poly(acrylic acid) interpenetrating network. Journal of Membrane Science, 107, 239-248.

Guo, Z., Liu, S., Chen, X., Ji, X., and Li, P. (2006). Hydroxy radicals scavenging activity of N-substituted chitosan and quaternized chitosan. Bioorganic & Medicinal Chemistry Letters, 16, 6348-6350.

Guo, Z., Xing, R., Liu, S., Zhong, Z., Ji, X., Wang, L., and Li, P. (2008). Antifungal properties of Schiff bases of chitosan, *N*-substituted chitosan and quaternized chitosan. Carbohydrate Polymer, 342, 1329-1332.

Guo, Z., Xing, R., Liu, S., Zhong, Z., Ji, X., Wang, L., and Li, P. (2007). The influence of the cationic of quaternized chitosan on antifungal activity. International Journal of Food Microbiology, 118, 214-217.

Guo, Z., Xing, R., Liu, S., Zhong, Z., Ji, X., Wang, L., and Li, P. (2008). The influence of molecular weight of quaternized chitosan on antifungal activity. Carbohydrate Polymer, 71, 694-697.

Hanna, J.R., and Giacopelli, J.A. (1997). A Review of Wound Healing and Wound Dressing Products. The Journal of Foot and Ankle Surgery, 36, 2-14.

Hennink, W.E., and Nostrum, C.F. (2002). Novel crosslinking methods to design hydrogels. Advanced Drug Delivery Review, 54, 13-36.

Hoven, V.P., Tangpasuthadol, V., Angkitpaiboon, Y., Vallapa, N., and Kiatkamjornwong, S. (2007). Surface-charged chitosan: Preparation and protein adsorption. Carbohydrate Polymers, 68, 44-53.

Je, J. Y., and Kim, S. K. (2006). Chiyosan Derivatives Killed Bacteria by Disrupting the Outer and Inner Membrance. Journal of Agricultural and Food Chemistry, 54, 6629-6633.

Jia, Z., Shen, D., and Xu, W. (2001). Synthesis and antibacterial activities of quaternary ammonium salt of chitosan. Carbohydrate Research, 333, 1-6.

Kamath, K.R., and Park, K. (1993). Biodegradable hydrogels in drug delivery. Advanced Drug Delivery Review, 11, 59-84.

Kim, C.H., and Choi, K.S. (2002). Synthesis and Antibacterial Activity of Quaternized Chitosan Derivatives Having Different Methylene Spacers. Journal of Industrial and Engineering Chemistry, 8, 71-76.

Kim, C.H., Choi, J.W., Chun, H.J., and Choi, K.S. (1997). Synthesis of chitosan derivatives with quaternary ammonium salt and their antibacterial activity. Polymer Bulletin, 38, 387-393.

Kim, I.Y., Seo, S.J., Moon, H.S., Yoo, M.K., Park, I.Y., Kim, B.C., and Cho, C.S. (2008). Chitosan and its derivatives for tissue engineering applications. Biotechnology Advances, 26, 1-21.

Koyano, T., Koshizaki, N., Umehara, H., Nagura, M., and Minoura, N. (2000). Surface states of PVA/chitosan blended hydrogels. Polymer, 4, 4461-4465.

Lee, K.Y., Ha, W.S., and Park, W.H. (1995). Blood compatibitity and biogegrability of partially *N*-acylated chitosan derivatives. Biomaterials, 16, 1211-1216.

Liu, N., Chen, X. G., Park, H. J., Liu, C. G., Liu, C. S., Meng, X. H., and Yu, L. J. (2006). Effect of MW and concentration of chitosan on antibacterial activity of Escherichia coli. Carbohydrate Polymer, 64, 60-65.

Lu, G., Kong, L., Sheng, B, Wang, G., Gong, Y., and Zhang, X. (2007). Degradation of covalently cross-linked carboxymethyl chitosan and its potential application for peripheral nerve regeneration. European Polymer Journal, 43, 3807-3818.

Makuuchi. K. (2010). Critical review of radiation processing of hydrogel and polysaccharide. Radiation Physics and Chemistry, 79, 267-271.

Malinovska, R.J., Cvetkovska, M., Kuzmanova, S., Tsvetanov, C., and Winkelhausen, E. (2010). Immobilization of saccharomyces cerevisiae in novel hydrogels based on hybrid networks of poly(ethylene oxide), alginate and chitosan for ethanol production. Macedonian Journal of Chemistry and Chemical Engineering, 29, 169-179.

Nho, Y.C., Kim, T.H., and Park, K.R. (2004). Radiation synthesis and characteristics of charcoal filled PVA/PVP hydrogels. Radiation Physics and Chemistry, 69, 351-353.

Ong, S. Y., Wu, J., Moochhala, S. M., Tan, M. H., and Lu, J. (2008). Development of a chitosan-based wound dressing with improved hemostatic and antibacterial properties. Biomaterials, 29, 4323-4332.

Pang, H. T., Chen, X. G., Park, H. J., Cha, D. S., and Kennedy, J. F. (2007). Preparation and rheological properties of deoxycholate-chitosan and chaboxymethyl-chitosan in aqueous systems. Carbohydrate Polymer, 69, 419-425.

Paul, W., and Sharma, C. P. (2004). Chitosan and Alginate Wound dressings : A Short Review. Trends in Biomaterial and Artificial Organs, 18, 18-23.

Peppas, N.A., Bures, P., Leobandung, W., and Ichikawa, H. Hydrogels on pharmaceutical formulations. European Journal of Phamaceutics and Biophamaceutics, 50, 27-46.

Razzak, M.T., Darwis, D., Zainuddin, and Sukirno. (). Irradiation of poly(vinyl alcohol) and poly(vinyl pyrrolidone) blended hydrogel for wound dressing. 151-161.

Rosiak, J.M., Janik, I., Kadlubowski, S., Kozicki, M., Kujawa, P., Stasica, P., and Ulanski, P. (2002). Radiation formation of hydrogels for biomedical application. International Atomic Energy Agency, 5-47.

Rosiak, J.M., and Ulanski, P. (1999). Synthesis of hydrogels by irradiation of polymers in aqueous solution. Radiation Physics and Chemistry, 55, 139-151.

Rosiak, J.M., Ulanski, P., Pajewski, L.A., Yoshi, F., and Makuuchi, K. (1995). Radiation formatiom of hydrogels for biomedical purposes some remaks and comments. Radiation Physics and Chemistry, 46(2), 161-168.

Rosiak, J.M., and Yoshii, F. (1999). Hydrogels and their medical applications. Nuclear Instruments and Methods in Physics Research B, 151, 56-64.

Salmawi, K.M. (2007). Gamma Radiation-Induced Crosslinked PVA/Chitosan Blends for Wound Dressing. Journal of Macromolecular Science, Part A: Pure and Applied Chemistry, 44, 541-545.

Shi, C., Zhu, Y., Ran, X., Wang, M., Su, Y., and Cheng, T. (2006). Therapeutic Potential of Chitosan and Its Derivatives in Regenerative Medicine. Journal of Surgical Research, 133, 185-193.

Sieval, A.B., Thanou, M., Kotze, A.F., Verhoef, J.C., Brussee, J., and Junginger, H.E. (1998). Preparation and NMR characterization of highly substituted N-trimetyl chitosan chloride. Carbohydrate Polymer, 36, 157-165.

Slaughter, B.V., Khurshid, S.S., Fisher, O.Z., Khademhosseini, A., and Peppas, N.A. (2009). Hydrogels in Regenerative Medicine. Advanced Material, 21, 3307-3329.

Stashak, T.S., Farsvedt, E., and Othic, A. (2004). Update on Wound Dressing : Indications and Best Use. Clinical Technique in Equine Pratice 3, 148-163.

Sun, L., Du, Y., Fan, L., Chen, X., and Yang, J. (2006). Preparation, characterization and antimicrobial activity of quaternized carboxymethyl chitosan and application as pulp-cap. Polymers, 47, 1796-1804.

Varshney, L. (2007). Role of natural polysaccharides in radiation formation of PVA-hydrogel wound dressing. Nuclear Instruments and Methods in Physics Research B, 255, 343-349.

Villinova, Pa. (1983). Standard methods for dilution antimicrobial susceptibility tests for bacteria that grow aerobically. Tentative Standard, M7-T3. National Committee for Clinical Laboratory Standards (United States), 30-89.

Wang, B., Kodama, M., Mukataka, S., and Kokufuta, E. (1998). On the intermolecular crosslinkkng of PVA chains in an aqueous solution by γ-ray irradiation. Polymer Gals and Networks, 6, 71-81.

Wang, M., Xu, L., Ju, X., Peng, J., Zhai, M., Li, J., and Wei, G. (2008). Enhanced radiation crosslinkng of carboxymethylated chitosan in the presence of acids or polyfunctional monomers. Polymer Degradation and Stability, 93, 1807-1813.

Wang, M., Xu, L., Ju, X., Peng, J., Zhai, M., Li, J., and Wei, G. (2008). Radiation synthesis of PVP/CMC hydrogels as wound dressing. Nuclear Instruments and Methods in Physics Research B, 265, 385-389.

Yang, T.C., Chou, C.C., and Li, C.F. (2005). Antibacterial activity of N-alkylated disaccharide chitosan derivatives. International Journal of Food Microbiology, 97, 237-245.

Yang, X., Liu, Q., Chen, X., Yu, F., and Zhu, Z. (2007). Investigation of PVA/ws-chitosan hydrogels prepared by combined γ–irradiation and freeze-thawing. Carbohydrate Polymers, 73, 401-408.

Zakurdaeva, O. A., Nesterov, S. V., Shmakova, N. A., Semenova, G. K., Sozontova, E. O., and Feldman, V. I. (2007). Radiation-chemical synthesis of poly(vinyl alcohol) hydrogel containing dicyclohexano-18-crown-6. Nuclear Instruments and Methods in Physics Research B, 265, 356-361.

Zhai, M., Yoshii, F., Kume, T., and Hashim, K. (2002). Synthesis of PVA/starch grafted hydrogels by irradiation. Carbohydrate Polymers, 50, 295-303.

Zhao, L., Mitomo, H., Nagasawa, N., Yosshii, F., and Kume, T. (2003). Radiation synthesis and characteristic of the hydrogels based on carboxymethylated chitin derivatives. Carbohydrate Polymers, 51, 169-175.

Zhao, L., Mitomo, H., Zhai, M., Yosshii, F., Nagasawa, N., and Kume, T. (2003). Synthesis of antibacterial PVA/CM-chitosan blend hydrogels with electron beam irradiation. Carbohydrate Polymers, 53, 439-446.

Zhao, L., Xu, L., Mitomo, H., and Yoshii, F. (2006). Synthesis of pH-sensitive PVP/CM-chitosan hydrogel with improved surface property by irradiation. Carbohydrate Polymers, 64, 473-480.

Zheng, L. Y., and Zhu, J. F. (2003). Study on antimicrobial activity of chitosan with different molecular weights. Carbohydrate Polymer, 54, 527-530.

APPENDICES

Appendix A Experimental Data of Gel Fraction Studies

Table A1 Raw data of gel fraction of the blended hydrogels in DW

CM-chitosan content (%w/w of PVA)	Gel fraction (%)		
	25 kGy	35 kGy	45 kGy
0	89.02	92.86	91.91
	88.32	91.61	92.47
	89.69	92.63	92.63
	88.69	91.34	92.64
	89.55	92.14	92.57
Avg.	89.05	92.12	92.45
SD	0.58	0.648	0.30
5	86.71	92.39	92.02
	87.77	90.62	90.94
	88.57	92.74	92.13
	89.03	92.52	92.92
	89.49	103.27	94.02
Avg.	88.31	92.07	92.00
SD	1.10	0.97	0.81
10	85.11	86.81	90.63
	85.67	88.98	90.36
	86.59	86.90	91.24
	87.37	85.90	89.30
	87.29	83.90	90.42
Avg.	86.41	87.15	90.39
SD	1.00	1.30	0.70
15	81.67	82.08	89.14
	83.01	82.61	89.58
	84.81	86.09	89.84
	84.43	85.71	90.97
	84.46	84.17	89.43
Avg.	83.67	84.13	89.79
SD	1.32	1.79	0.71
20	80.00	81.91	89.44
	78.02	77.14	89.85
	79.51	79.46	89.78
	78.91	79.20	89.05
	80.73	83.33	89.97
Avg.	79.43	80.21	89.62
SD	1.03	2.43	0.37

Appendix B Experimental Data of Swelling Behavior Studies

Table B1 Raw data of swelling behavior of the blended hydrogels at 25 kGy in SBF

CM-chitosan content (%w/w of PVA)	2 h	4 h	6 h	8 h	10 h	12 h	24 h	48 h
0	127.96	126.32	141.67	143.75	145.35	152.81	164.00	151.82
	136.14	121.54	132.94	142.00	145.83	141.82	153.61	167.67
	126.09	129.36	123.26	135.35	136.71	143.43	158.97	172.41
	106.32	120.62	133.69	117.98	147.37	140.59	140.66	140.00
	117.59	123.23	136.67	132.00	140.91	151.95	155.79	156.52
Avg.	122.82	124.21	133.64	134.22	143.23	146.12	154.61	157.69
SD	11.34	3.61	6.744	10.26	4.37	5.81	8.72	12.90
5	150.00	137.89	164.95	182.95	172.55	164.13	167.86	172.84
	157.47	145.92	161.86	158.24	150.59	173.56	169.07	175.82
	143.04	173.49	159.55	167.00	168.57	168.69	178.72	173.81
	142.86	151.58	165.63	162.11	173.96	177.88	163.54	172.04
	148.28	150.00	162.73	154.25	163.00	160.92	170.19	172.28
Avg.	148.33	151.78	162.94	164.91	165.73	169.04	169.88	173.36
SD	6.01	13.25	2.45	11.13	9.47	6.87	5.55	1.54
10	154.08	174.75	196.19	202.04	197.96	186.73	193.94	195.83
	167.50	177.23	184.61	176.85	184.11	193.26	187.91	188.79
	159.57	171.56	185.98	193.27	179.59	189.25	189.01	198.13
	158.44	178.07	188.66	178.85	185.42	189.89	191.30	185.42
	156.84	170.00	171.29	178.57	187.50	183.53	184.21	180.81
Avg.	159.29	174.32	185.35	185.92	186.92	188.53	189.28	189.80
SD	5.03	3.50	9.04	11.18	6.82	3.64	3.66	7.19

Table B1(continue) Raw data of swelling behavior of the blended hydrogels at 25 kGy in SBF

CM-chitosan content (%w/w of PVA)	2 h	4 h	6 h	8 h	10 h	12 h	24 h	48 h
15	223.44	227.91	232.81	232.56	239.39	255.10	272.73	297.33
	233.33	220.00	232.14	261.86	247.06	259.14	268.82	291.67
	210.09	230.00	227.20	239.56	239.60	269.23	275.44	283.70
	217.02	236.00	246.74	233.77	248.03	252.17	273.33	288.30
	216.67	232.98	238.54	232.58	240.86	259.05	270.25	288.30
Avg.	220.11	229.38	235.49	240.06	242.99	258.94	272.11	289.86
SD	8.77	6.07	7.47	12.52	4.21	6.45	2.61	5.05
20	220.00	237.25	240.50	264.76	284.68	282.17	298.82	301.90
	214.05	240.87	243.75	256.14	284.21	292.48	297.39	314.66
	224.17	241.49	247.75	262.18	281.74	297.17	297.32	298.32
	236.27	240.78	244.12	256.48	287.78	287.60	297.64	300.88
	228.45	248.15	235.23	269.83	282.46	301.72	298.23	308.74
Avg.	224.59	241.71	242.27	261.88	284.17	292.23	297.88	304.90
SD	8.42	3.97	4.70	5.78	2.35	7.70	0.64	6.68

Table B2 Raw data of swelling behavior of the blended hydrogels at 35 kGy in SBF

CM-chitosan content (%w/w of PVA)	2 h	4 h	6 h	8 h	10 h	12 h	24 h	48 h
0	113.12	118.28	114.02	135.62	143.24	150.70	147.30	145.00
	121.43	124.36	121.43	120.78	143.75	140.24	142.35	153.95
	120.22	126.58	123.45	130.88	143.42	140.00	153.26	154.76
	118.56	123.46	133.33	128.57	136.99	146.51	144.74	144.71
	119.54	111.39	126.14	122.99	143.21	141.03	144.44	142.05
Avg.	117.26	120.81	123.67	127.77	142.12	143.70	146.42	148.09
SD	5.89	6.08	7.03	5.99	2.88	4.74	4.21	5.84
5	128.38	121.84	173.08	162.50	165.79	168.08	168.49	172.29
	133.66	139.76	162.67	166.32	156.25	165.59	164.00	167.03
	136.99	126.09	152.81	166.67	178.79	165.93	167.78	167.59
	132.97	119.39	166.67	164.89	170.21	167.39	165.98	171.28
	126.88	154.22	165.59	165.98	158.82	168.63	168.83	168.60
Avg.	131.77	132.26	164.16	165.27	165.97	167.13	167.016	169.36
SD	4.11	14.58	7.40	1.68	9.05	1.32	2.01	2.31
10	143.48	172.41	185.42	198.89	191.51	194.79	186.91	185.39
	170.71	155.29	177.89	171.58	170.93	177.32	188.42	185.10
	156.00	166.85	187.50	187.10	181.44	178.41	183.69	186.73
	148.24	159.76	182.02	180.46	180.00	178.72	185.22	193.55
	149.43	160.00	187.06	185.87	196.70	192.94	182.28	185.88
Avg.	153.57	162.86	183.98	184.78	184.12	184.44	185.31	187.33
SD	10.57	6.75	4.02	9.98	10.14	8.65	2.45	3.53

Table B2(continue) Raw data of swelling behavior of the blended hydrogels at 35 kGy in SBF

CM-chitosan content (%w/w of PVA)	2 h	4 h	6 h	8 h	10 h	12 h	24 h	48 h
15	176.14	212.22	213.75	237.78	251.11	231.03	268.08	278.57
	192.05	209.57	219.10	231.58	244.68	239.36	271.43	280.00
	171.58	205.83	211.70	231.18	243.88	250.00	267.78	277.42
	175.56	197.73	216.33	252.87	249.00	250.55	265.22	275.58
	176.47	207.37	211.76	263.04	250.56	254.74	264.44	276.67
Avg.	178.36	206.547	214.53	243.29	247.85	245.14	267.39	277.65
SD	7.90	5.487	3.18	14.11	3.36	6.55	2.75	1.71
20	204.54	233.667	242.42	244.23	261.11	273.20	273.08	294.74
	198.01	236.277	254.63	250.50	257.29	285.26	280.00	291.59
	200.00	240.22	226.09	248.35	275.96	267.33	273.68	296.81
	202.83	238.78	242.24	258.77	262.24	278.22	287.63	286.41
	189.91	237.378	246.94	254.35	275.47	268.75	266.35	295.29
Avg.	199.06	237.268	242.46	251.24	266.42	274.55	276.15	292.97
SD	5.70	2.50	10.44	5.58	8.69	7.35	8.03	4.13

Table B3 Raw data of swelling behavior of the blended hydrogels at 45 kGy in SBF

CM-chitosan content (%w/w of PVA)	2 h	4 h	6 h	8 h	10 h	12 h	24 h	48 h
0	102.41	184.00	122.62	123.46	128.57	133.75	135.16	147.13
	109.52	174.44	114.81	124.71	129.07	140.70	142.70	144.44
	121.95	177.78	128.92	125.56	134.52	146.39	141.57	141.25
	112.50	172.04	112.09	123.71	135.96	141.57	146.24	142.05
	115.46	183.16	125.88	125.61	131.91	139.56	141.11	144.44
Avg.	112.37	178.28	120.86	124.61	132.01	140.39	141.36	143.86
SD	7.22	5.25	7.19	1.01	3.25	4.54	4.00	2.32
5	124.71	119.77	132.10	132.58	142.53	155.26	158.33	165.79
	128.95	117.81	135.71	135.48	144.00	153.57	163.38	165.22
	122.37	112.28	122.73	128.38	153.95	163.24	165.88	173.17
	127.84	115.48	131.52	128.16	143.62	160.00	168.67	171.25
	124.71	117.89	129.13	134.44	148.98	154.17	162.07	170.33
Avg.	125.71	116.65	130.24	131.81	146.61	157.25	163.67	169.15
SD	2.65	2.88	4.8153	3.40	4.79	4.19	3.91	3.49
10	137.50	130.49	140.00	156.34	183.08	175.36	178.57	179.35
	145.12	125.00	157.65	154.55	173.44	173.81	178.89	176.92
	143.53	126.58	156.36	152.05	176.19	181.18	176.09	191.36
	147.67	125.30	146.03	159.38	162.35	178.67	178.57	173.91
	149.32	129.35	147.44	158.24	170.79	162.82	175.27	172.92
Avg.	144.63	127.34	149.50	156.11	173.17	174.37	177.48	178.89
SD	4.57	2.46	7.42	2.92	7.58	7.06	1.6731	7.42

Table B3(continue) Raw data of swelling behavior of the blended hydrogels at 45 kGy in SBF

CM-chitosan content (%w/w of PVA)	2 h	4 h	6 h	8 h	10 h	12 h	24 h	48 h
15	160.94	146.43	167.50	173.33	200.00	209.88	214.74	227.06
	153.85	141.86	169.32	186.32	198.80	213.41	223.75	218.92
	151.43	158.33	167.11	181.71	201.27	207.84	225.00	224.44
	147.73	137.93	160.00	178.02	194.05	204.26	219.42	226.37
	158.82	156.16	161.33	183.10	203.26	225.00	231.25	231.52
Avg.	154.55	148.14	165.05	180.50	199.47	212.08	222.83	225.66
SD	5.38	8.87	4.12	4.99	3.4545	7.95	6.20	4.58
20	165.28	158.90	195.16	200.00	205.06	226.67	222.67	235.90
	172.86	160.56	190.91	201.72	203.64	218.03	225.71	238.03
	174.29	165.08	204.84	201.16	215.38	215.94	223.29	234.72
	173.33	159.21	203.70	197.30	213.33	214.67	237.31	232.84
	173.75	156.00	198.75	203.66	217.86	226.19	236.84	235.21
Avg.	171.90	159.95	198.67	200.77	211.05	220.3	229.16	235.34
SD	3.74	3.31	5.83	2.35	6.3471	5.72	7.31	1.88

Table B4 Raw data of swelling behavior of the blended hydrogels at 25 kGy in DW

CM-chitosan content (%w/w of PVA)	2 h	4 h	6 h	8 h	10 h	12 h	24 h	48 h
0	145.88	161.36	156.25	155.17	183.65	195.79	196.26	193.15
	147.69	143.75	143.59	164.84	187.63	190.48	197.78	216.50
	137.25	139.51	160.24	185.00	169.77	174.53	191.94	175.00
	136.71	158.54	158.57	147.25	193.75	192.00	196.91	212.00
	146.94	147.50	143.94	165.88	163.51	188.89	197.70	203.06
Avg.	142.90	150.13	152.52	163.63	179.66	188.34	196.12	199.94
SD	5.44	9.45	8.12	14.17	12.62	8.13	2.42	16.57
5	179.00	182.73	208.57	200.00	239.02	235.05	278.57	251.40
	184.93	191.09	201.08	195.65	237.50	234.15	233.71	267.01
	180.61	190.00	202.20	233.00	210.42	223.17	250.54	281.05
	187.91	193.55	203.49	220.69	218.89	240.46	244.79	252.27
	179.17	192.23	185.00	200.00	210.11	223.17	252.00	262.07
Avg.	182.32	189.92	200.07	209.87	223.19	231.2	251.92	262.76
SD	3.94	4.23	8.90	16.19	14.21	7.72	16.54	12.17
10	240.37	267.62	282.61	296.94	304.81	333.68	336.45	362.50
	238.14	279.05	285.56	304.17	304.94	312.87	337.25	343.97
	247.66	257.27	288.24	298.00	311.50	316.82	337.76	357.01
	239.02	286.54	281.40	276.19	312.04	311.11	322.34	346.88
	254.13	254.24	281.69	283.33	312.24	319.51	331.76	378.79
Avg.	243.86	268.94	283.9	291.73	309.11	318.8	333.11	357.83
SD	6.86	13.84	2.93	11.54	3.87	8.95	6.47	13.91

Table B4(continue) Raw data of swelling behavior of the blended hydrogels at 25 kGy in SBF

CM-chitosan content (%w/w of PVA)	2 h	4 h	6 h	8 h	10 h	12 h	24 h	48 h
15	386.11	420.62	422.99	436.78	477.61	504.50	508.41	553.85
	396.04	414.00	417.58	457.29	487.50	518.18	507.89	539.80
	396.88	430.85	423.75	436.19	472.04	508.79	508.45	546.48
	392.39	426.73	418.68	424.76	481.32	507.22	530.21	549.02
	389.01	422.92	438.82	456.88	486.02	502.35	501.02	566.23
Avg.	392.09	423.02	424.37	442.38	480.9	508.21	511.2	551.07
SD	4.58	6.37	8.51	14.25	6.31	6.10	11.08	9.87
20	528.42	571.15	583.65	595.31	580.81	602.78	595.80	614.71
	536.67	567.78	581.34	599.03	594.59	605.36	599.02	613.04
	538.00	578.95	575.31	571.15	595.70	601.77	606.19	600.88
	537.11	568.33	579.55	574.73	585.45	604.44	602.06	602.17
	547.14	595.79	581.82	578.57	589.74	600.00	613.95	600.86
Avg.	537.47	576.4	580.33	583.76	589.26	602.87	603.40	606.33
SD	6.64	11.72	3.17	12.59	6.25	2.13	7.03	6.93

Table B5 Raw data of swelling behavior of the blended hydrogels at 35 kGy in DW

CM-chitosan content (%w/w of PVA)	2 h	4 h	6 h	8 h	10 h	12 h	24 h	48 h
0	138.75	147.95	152.63	166.67	168.18	175.58	180.61	187.80
	140.30	115.38	154.17	161.45	176.83	181.43	191.57	187.06
	129.03	131.88	156.41	154.32	164.04	198.92	183.33	186.60
	129.21	147.73	166.67	154.00	188.46	179.52	188.10	187.50
	118.07	127.71	134.52	154.65	186.42	175.53	193.26	196.47
Avg.	131.07	134.13	152.88	158.22	176.79	182.2	187.37	189.09
SD	8.95	13.91	11.63	5.65	10.79	9.69	5.36	4.15
5	149.48	179.10	202.27	203.33	217.39	247.56	235.87	249.40
	165.85	198.94	204.94	212.36	246.43	224.72	236.05	249.47
	152.56	159.34	203.53	212.90	202.44	245.92	253.57	251.69
	153.41	157.47	204.60	216.05	226.14	223.81	248.98	235.35
	147.83	180.52	195.89	210.11	211.43	231.58	253.45	265.67
Avg.	153.83	174.07	202.25	210.95	220.76	234.72	245.58	250.32
SD	7.09	17.12	3.70	4.76	16.75	11.39	8.98	10.76
10	235.63	248.65	258.54	261.73	327.59	321.33	313.83	348.68
	232.14	225.00	260.49	279.27	307.95	300.00	322.89	350.57
	229.47	274.19	253.26	278.49	297.56	329.67	321.51	348.91
	219.57	263.95	233.71	282.42	304.90	311.58	325.27	347.92
	239.71	230.00	268.29	290.32	303.37	312.66	326.32	355.00
Avg.	232.42	248.36	254.86	278.45	308.27	315.05	321.96	350.22
SD	7.60	21.17	13.00	10.45	11.44	11.15	4.93	2.84

Table B5(continue) Raw data of swelling behavior of the blended hydrogels at 35 kGy in DW

CM-chitosan content (%w/w of PVA)	2 h	4 h	6 h	8 h	10 h	12 h	24 h	48 h
15	339.33	406.74	424.47	420.69	477.42	483.33	506.25	554.26
	339.08	414.29	416.16	433.33	476.67	489.90	511.58	551.04
	356.04	400.00	400.00	437.50	458.43	487.74	500.00	548.48
	325.51	428.57	427.66	462.24	453.26	472.29	502.88	561.29
	363.16	407.61	425.58	421.05	469.32	475.00	522.11	541.18
Avg.	344.62	411.44	418,77	434.96	467.02	481.65	508.56	551.25
SD	14.98	10.83	11.37	16.96	10.84	7.74	8.71	7.40
20	529.41	565.35	576.83	540.86	583.96	610.89	602.02	607.22
	517.35	527.27	558.82	586.67	563.16	601.01	597.75	602.88
	493.88	536.46	543.01	560.36	584.11	576.77	600.00	605.45
	528.57	524.14	542.57	541.67	579.00	606.82	606.38	610.58
	531.52	561.80	535.71	578.35	571.29	587.76	608.57	594.29
Avg.	520.15	543.00	551.39	561.58	576.3	596.65	602.95	604.08
SD	15.69	19.36	16.55	20.84	9.01	14.14	4.47	6.15

Table B6 Raw data of swelling behavior of the blended hydrogels at 45 kGy in DW

CM-chitosan content (%w/w of PVA)	2 h	4 h	6 h	8 h	10 h	12 h	24 h	48 h
0	134.52	123.91	127.17	130.69	174.74	141.94	195.35	178.31
	123.53	129.41	127.59	127.06	150.57	182.80	171.28	177.66
	117.58	131.46	138.14	120.22	154.08	158.02	156.04	190.59
	122.58	124.72	124.24	150.00	157.45	185.71	168.67	173.08
	129.35	128.89	136.67	150.00	159.09	171.58	194.44	178.02
Avg.	125.51	127.68	130.76	135.6	159.19	168.01	177.16	179.53
SD	6.54	3.23	6.22	13.68	9.29	18.20	17.19	6.54
5	138.2	143.68	174.71	175.61	212.64	231.82	264.89	272.92
	124.21	120.83	149.02	173.68	219.32	213.00	270.24	283.87
	131.52	138.04	166.67	169.44	195.29	237.36	267.01	242.35
	133.68	157.84	174.51	177.01	212.64	252.44	237.35	264.89
	131.82	154.55	160.67	163.89	203.81	229.89	250.00	243.69
Avg.	131.89	142.99	165.12	171.93	208.74	232.90	257.9	261.54
SD	5.05	14.75	10.74	5.32	9.32	14.21	13.86	18.21
10	216.67	241.38	255.70	258.70	261.33	262.96	274.26	290.00
	223.29	228.72	280.46	252.63	261.29	275.68	281.11	256.16
	233.71	244.87	241.30	252.50	238.64	287.78	288.89	290.24
	242.86	241.57	226.14	255.42	268.00	285.23	286.67	283.33
	215.48	240.48	239.13	248.24	270.51	275.90	260.24	308.99
Avg.	226.4	239.4	248.55	253.5	259.95	277.51	278.23	285.75
SD	11.71	6.20	20.69	3.89	12.59	9.78	11.54	19.10

Table B6(continue) Raw data of swelling behavior of the blended hydrogels at 45 kGy in DW

CM-chitosan content (%w/w of PVA)	2 h	4 h	6 h	8 h	10 h	12 h	24 h	48 h
15	300.00	343.37	320.69	381.18	388.66	394.32	389.80	387.50
	324.39	297.92	340.20	320.00	363.53	372.41	398.80	420.75
	327.96	307.06	362.5	313.64	363.64	373.75	387.91	376.92
	278.26	296.59	312.75	360.81	342.72	394.32	365.43	378.31
	295.35	329.27	323.60	356.92	366.67	364.71	362.07	421.95
Avg.	305.19	314.84	331.95	346.51	365.04	379.9	380.80	397.09
SD	20.83	20.63	19.79	28.72	16.30	13.61	16.14	22.52
20	353.04	358.33	386.25	383.95	425.33	473.08	466.67	475
	356.34	365.48	388.46	381.69	472.73	450.91	468.83	497.85
	334.62	361.73	350.00	390.12	342.11	452.94	457.35	469.7
	381.16	358.11	436.92	397.89	442.35	468.83	489.71	498.41
	355.71	358.14	382.67	408.96	449.28	465.15	468.00	470.59
Avg.	356.17	360.36	388.86	392.52	426.36	462.18	470.11	482.31
SD	16.58	3.25	31.09	11.13	50.08	9.80	11.88	14.58

Appendix C Experimental Data of Weight Loss Studies

Table C1 Raw data of weight loss of the blended hydrogels at 25 kGy in SBF

CM-chitosan content (%w/w of PVA)	2 h	4 h	6 h	8 h	10 h	12 h	24 h	48 h
0	1.08	2.63	2.78	2.50	2.33	3.37	4.00	3.64
	2.41	3.08	2.35	3.00	2.08	2.73	3.09	4.04
	2.17	2.75	2.33	2.02	3.8	3.03	3.85	4.60
	2.11	2.06	3.26	3.37	3.16	3.96	3.30	3.81
	2.78	2.02	3.33	4.00	3.41	3.9	4.21	4.35
Avg.	2.11	2.51	2.81	2.98	2.95	3.4	3.69	4.09
SD	0.63	0.46	0.48	0.77	0.73	0.54	0.48	0.39
5	3.66	3.16	3.09	3.41	3.92	4.35	4.76	3.7
	2.30	3.06	3.09	4.4	3.53	3.45	4.12	4.4
	2.53	3.61	3.37	3	3.81	4.04	3.19	4.76
	3.30	3.16	4.17	3.16	3.13	3.85	4.17	4.3
	3.45	3.19	3.64	3.19	4	3.45	3.85	4.95
Avg.	3.05	3.24	3.47	3.43	3.68	3.83	4.02	4.42
SD	0.56	0.22	0.45	0.56	0.36	0.39	0.57	0.48
10	3.06	4.04	4.76	4.08	5.1	5.1	6.06	4.17
	3.75	4.95	4.81	5.56	4.67	4.49	4.4	5.17
	4.26	4.59	4.67	3.85	4.08	5.38	4.4	6.54
	2.60	4.39	3.09	4.81	4.17	4.49	4.35	5.21
	4.21	3.33	4.95	4.46	4.81	4.71	5.26	5.05
Avg.	3.57	4.26	4.46	4.55	4.57	4.83	4.89	5.23
SD	0.73	0.61	0.77	0.67	0.43	0.39	0.76	0.85

Table C1(continue) Raw data of weight loss of the blended hydrogels at 25 kGy in SBF

CM-chitosan content (%w/w of PVA)	2 h	4 h	6 h	8 h	10 h	12 h	24 h	48 h
15	4.69	3.49	4.69	4.65	5.05	6.12	6.06	5.33
	4.44	4.44	4.76	5.15	5.88	6.45	6.45	6.25
	3.67	5.00	4.00	5.49	4.95	5.49	5.26	6.52
	4.26	4.00	4.35	5.19	4.72	5.43	6.67	5.32
	3.70	4.26	4.17	4.49	5.38	5.51	5.79	5.32
Avg.	4.15	4.24	4.39	5.00	5.20	5.80	6.05	5.75
SD	0.45	0.56	0.33	0.41	0.45	0.46	0.55	0.59
20	6.36	5.81	4.96	6.67	5.41	6.98	7.06	7.62
	4.96	4.44	4.46	5.26	5.26	6.02	6.96	6.03
	4.17	5.00	5.41	5.88	6.09	6.60	6.25	6.72
	4.90	6.00	5.88	5.56	5.56	6.61	6.3	7.96
	5.17	5.32	5.68	5.17	6.14	6.03	7.08	7.77
Avg.	5.11	5.32	5.28	5.71	5.69	6.45	6.73	7.22
SD	0.80	0.63	0.57	0.60	0.40	0.42	0.42	0.82

Table C2 Raw data of weight loss of the blended hydrogels at 35 kGy in SBF

CM-chitosan content (%w/w of PVA)	2 h	4 h	6 h	8 h	10 h	12 h	24 h	48 h
0	2.38	2.15	2.80	2.74	2.70	2.82	2.70	3.75
	1.19	2.56	2.38	2.60	3.13	3.66	3.53	2.63
	1.12	2.53	3.70	2.94	2.63	3.33	3.26	3.57
	1.03	2.47	2.08	2.60	2.74	2.33	2.63	3.53
	1.15	2.53	2.27	2.30	2.47	2.56	3.33	3.41
Avg.	1.79	2.45	2.65	2.63	2.73	2.94	3.09	3.38
SD	0.84	0.17	0.65	0.23	0.24	0.55	0.40	0.43
5	2.70	3.45	2.56	3.41	3.95	4.26	4.11	3.61
	3.96	2.41	4.00	3.16	4.17	3.23	3.00	3.30
	1.37	3.26	3.37	3.23	3.03	3.30	4.44	3.70
	3.30	4.08	3.23	3.19	3.19	3.26	3.09	3.19
	3.23	2.41	3.23	4.12	3.92	4.90	3.90	3.49
Avg.	2.91	3.12	3.28	3.42	3.65	3.79	3.71	3.46
SD	0.97	0.72	0.51	0.40	0.51	0.76	0.64	0.21
10	3.26	3.45	4.17	4.44	3.77	5.21	4.67	4.49
	3.03	3.53	4.21	4.21	3.49	3.09	5.26	5.32
	3.00	3.26	4.17	4.30	4.12	4.55	4.35	5.10
	2.35	3.66	4.49	3.45	4.44	4.26	4.55	4.30
	4.49	2.35	2.35	4.35	5.49	5.88	5.06	4.71
Avg.	3.23	3.25	3.88	4.15	4.26	4.60	4.71	4.78
SD	0.78	0.52	0.86	0.40	0.78	1.05	0.38	0.42

Table C2(continue) Raw data of weight loss of the blended hydrogels at 35 kGy in SBF

CM-chitosan content (%w/w of PVA)	2 h	4 h	6 h	8 h	10 h	12 h	24 h	48 h
15	3.41	3.33	5.00	4.44	5.56	4.60	5.32	5.10
	3.41	4.26	4.49	4.21	5.32	5.32	5.49	6.32
	4.21	4.85	4.26	4.30	4.08	6.82	5.56	5.38
	3.33	3.41	4.08	4.60	5.00	4.40	5.43	5.81
	3.53	3.16	3.53	4.35	-	5.26	5.56	5.56
Avg.	3.58	3.80	4.27	4.38	4.99	5.28	5.47	5.63
SD	0.36	0.72	0.54	0.15	0.65	0.95	0.10	0.46
20	4.55	4.95	5.05	5.77	6.48	6.19	5.77	6.32
	4.95	4.90	5.46	5.05	6.25	5.26	6.32	6.54
	4.12	5.43	5.43	5.49	5.77	3.96	6.14	6.38
	3.77	5.10	5.17	5.26	5.10	5.94	6.19	6.80
	4.59	5.05	5.10	5.43	5.66	8.04	7.48	7.06
Avg.	4.40	5.09	5.24	5.40	5.85	5.88	6.38	6.62
SD	0.45	0.21	0.19	0.27	0.54	1.48	0.65	0.31

Table C3 Raw data of weight loss of the blended hydrogels at 45 kGy in SBF

CM-chitosan content (%w/w of PVA)	2 h	4 h	6 h	8 h	10 h	12 h	24 h	48 h
0	1.20	1.16	2.38	2.47	2.38	2.50	2.20	3.45
	1.19	2.74	1.48	2.35	2.33	2.33	3.37	2.47
	1.22	1.75	2.41	2.22	2.38	3.09	3.37	2.50
	2.08	2.38	2.20	2.06	3.37	2.25	3.23	3.41
	2.06	2.11	2.35	2.44	2.13	3.30	2.22	3.33
Avg.	1.55	2.03	2.16	2.31	2.52	2.69	2.88	3.03
SD	0.48	0.60	0.39	0.17	0.49	0.47	0.61	0.50
5	2.35	2.44	2.47	2.25	3.45	2.63	3.57	2.63
	2.63	1.67	2.86	3.23	2.67	2.38	2.82	3.26
	1.32	2.53	3.03	2.7	2.63	2.94	3.53	3.66
	2.06	2.41	2.17	2.91	3.19	4.00	2.41	2.50
	2.35	2.17	1.94	2.22	3.06	3.13	3.45	4.40
Avg.	2.14	2.24	2.49	2.66	3.00	3.02	3.16	3.29
SD	0.50	0.35	0.45	0.43	0.35	0.62	0.52	0.78
10	2.78	3.57	2.86	4.23	3.08	4.35	3.57	4.35
	2.44	3.49	3.53	3.41	4.69	3.57	4.44	2.56
	2.35	2.78	3.64	2.74	3.57	3.53	4.35	2.47
	2.33	2.30	3.17	3.13	4.71	4.00	4.29	4.35
	2.74	2.74	2.56	3.30	3.37	3.85	4.30	4.17
Avg.	2.53	2.98	3.15	3.36	3.88	3.93	4.19	3.58
SD	0.22	0.54	0.45	0.55	0.76	0.34	0.35	0.97

Table C3(continue) Raw data of weight loss of the blended hydrogels at 45 kGy in SBF

CM-chitosan content (%w/w of PVA)	2 h	4 h	6 h	8 h	10 h	12 h	24 h	48 h
15	3.13	2.74	3.75	5.33	4.76	4.94	4.21	4.71
	2.56	2.82	4.55	4.21	3.61	4.88	5.00	5.41
	2.86	3.17	3.95	3.66	5.06	4.90	4.55	5.56
	3.41	3.95	4.71	3.30	3.57	4.26	4.85	5.49
	3.53	4.00	4.00	4.23	4.35	4.00	5.21	3.26
Avg.	3.10	3.34	4.19	4.14	4.27	4.59	4.76	4.88
SD	0.40	0.61	0.41	0.77	0.67	0.44	0.39	0.97
20	4.17	5.33	4.84	4.48	5.06	5.00	6.67	6.41
	4.29	4.44	4.55	3.45	5.45	4.92	4.29	5.63
	4.29	4.44	4.84	5.81	5.13	4.35	5.48	5.56
	3.33	4.30	4.94	5.41	5.33	6.67	5.97	5.97
	5.00	4.21	3.75	4.88	3.57	4.76	4.21	5.63
Avg.	4.21	4.55	4.58	4.80	4.91	5.14	5.32	5.84
SD	0.59	0.45	0.49	0.91	0.76	0.89	1.07	0.36

Table C4 Raw data of weight loss of the blended hydrogels at 25 kGy in DW

CM-chitosan content (%w/w of PVA)	2 h	4 h	6 h	8 h	10 h	12 h	24 h	48 h
0	2.35	3.41	3.75	5.94	5.77	5.26	8.41	9.59
	3.08	1.25	3.84	4.30	6.19	5.95	6.67	8.74
	2.94	3.70	3.61	5.88	5.81	8.49	8.06	7.29
	2.53	6.10	5.71	5.61	6.25	7.00	7.22	8.00
	2.04	5.00	4.55	4.76	6.76	6.17	6.90	8.16
Avg.	2.59	3.89	4.29	5.39	6.16	6.58	7.45	8.36
SD	0.42	1.83	0.87	0.73	0.34	1.24	0.75	0.86
5	6.00	8.18	6.67	8.14	8.54	9.28	10.20	9.35
	5.48	7.92	7.53	8.70	8.33	8.54	8.99	10.31
	6.12	8.00	8.79	8.00	9.37	9.76	10.75	9.47
	5.49	7.53	8.14	8.05	7.78	9.92	9.37	10.23
	6.25	6.80	8.00	8.00	8.99	8.54	9.00	10.34
Avg.	5.87	7.68	7.83	8.18	8.60	9.21	9.66	9.94
SD	0.36	0.55	0.79	0.30	0.61	0.66	0.78	0.49
10	7.34	9.52	10.87	11.22	10.58	10.53	13.08	14.58
	9.32	9.52	10.00	10.42	11.11	17.82	13.73	14.66
	7.48	10.00	9.41	9.00	15.93	13.08	13.27	14.95
	9.76	8.65	10.47	8.33	12.04	13.33	12.77	14.58
	8.26	9.32	9.86	11.90	14.29	10.98	12.94	14.14
Avg.	8.43	9.41	10.12	10.18	12.79	13.15	13.16	14.58
SD	1.08	0.49	0.56	1.49	2.26	2.89	0.37	0.29

Table C4(continue) Raw data of weight loss of the blended hydrogels at 25 kGy in DW

CM-chitosan content (%w/w of PVA)	2 h	4 h	6 h	8 h	10 h	12 h	24 h	48 h
15	10.19	11.34	11.49	11.49	16.42	15.32	14.95	16.48
	13.86	9.00	12.09	13.54	12.50	15.15	18.42	17.35
	12.50	9.57	11.25	15.24	15.05	14.29	14.08	18.31
	8.70	10.89	9.89	17.14	13.19	14.43	13.54	15.69
	7.69	11.46	10.59	13.76	15.05	16.47	14.29	15.58
Avg.	10.59	10.45	11.06	14.24	14.44	15.13	15.06	16.68
SD	2.57	1.10	0.85	2.10	1.58	0.87	1.95	1.15
20	12.63	11.54	9.62	14.06	15.15	16.67	19.33	19.61
	5.833	12.22	11.19	11.65	15.32	20.54	17.65	18.48
	14.00	10.53	14.81	13.46	13.98	18.58	18.56	19.30
	13.40	11.67	14.77	17.58	14.55	15.56	18.56	17.39
	10.00	13.68	11.57	16.67	12.82	16.36	18.60	20.69
Avg.	11.17	11.93	12.39	14.68	14.36	17.54	18.54	19.09
SD	3.353	1.157	2.31	2.419	1.01	2.01	0.60	1.24

Table C5 Raw data of weight loss of the blended hydrogels at 35 kGy in DW

CM-chitosan content (%w/w of PVA)	2 h	4 h	6 h	8 h	10 h	12 h	24 h	48 h
0	2.50	2.82	3.95	4.17	4.55	5.81	5.10	6.10
	1.49	4.00	2.78	4.82	4.88	5.71	8.43	7.06
	2.15	2.99	3.85	4.94	6.74	6.45	7.29	7.22
	2.25	2.33	3.70	6.00	5.13	6.02	7.14	7.96
	2.41	3.75	3.57	3.49	4.94	7.45	6.74	7.06
Avg.	2.16	3.18	3.57	4.68	5.25	6.29	6.94	7.08
SD	0.40	0.69	0.46	0.94	0.86	0.71	1.21	0.66
5	5.16	5.97	5.68	6.67	8.70	8.54	7.61	7.23
	6.10	5.32	6.17	8.99	7.14	7.87	8.14	8.42
	5.13	5.49	7.06	6.45	8.54	8.16	8.33	8.99
	5.68	5.75	6.90	8.64	7.96	8.33	8.16	8.08
	3.26	6.49	5.48	6.74	7.62	7.90	8.62	8.96
Avg.	5.07	5.81	6.26	7.50	7.99	8.16	8.17	8.34
SD	1.09	0.46	0.71	1.21	0.64	0.28	0.37	0.73
10	6.90	8.12	8.54	8.64	10.13	12.00	10.64	10.53
	5.95	8.33	7.41	9.76	11.39	10.23	10.84	11.49
	6.32	7.53	9.78	9.68	10.81	10.99	12.90	11.96
	6.52	6.98	8.99	8.79	10.87	11.58	12.09	13.54
	7.35	8.33	10.98	9.68	11.25	11.39	10.53	11.25
Avg.	6.39	7.86	9.14	9.31	10.89	11.24	11.40	11.75
SD	0.54	0.59	1.34	0.54	0.49	0.67	1.05	1.13

Table C5(continue) Raw data of weight loss of the blended hydrogels at 35 kGy in DW

CM-chitosan content (%w/w of PVA)	2 h	4 h	6 h	8 h	10 h	12 h	24 h	48 h
15	8.99	8.99	9.57	12.64	12.90	15.69	13.54	14.89
	6.90	9.52	10.10	10.75	10.00	13.13	13.68	14.58
	7.69	8.43	10.11	11.46	11.24	12.26	13.83	12.12
	9.18	8.79	9.57	10.20	14.13	12.05	13.46	13.98
	9.47	8.70	10.47	9.47	13.64	15.91	14.74	15.29
Avg.	8.45	8.89	9.97	10.91	12.38	13.81	13.85	14.17
SD	1.10	0.41	0.39	1.21	1.72	1.86	0.52	1.24
20	11.76	10.89	12.20	13.98	14.15	15.84	12.12	16.49
	10.20	12.12	12.75	15.24	14.91	14.14	15.73	17.31
	9.184	10.42	11.83	12.61	14.95	15.15	19.44	19.09
	10.71	10.34	11.88	12.50	13.00	15.91	14.89	18.27
	10.87	11.24	11.61	13.40	14.85	14.29	17.14	17.14
Avg.	10.55	11.00	12.05	13.55	14.37	15.07	15.87	17.66
SD	0.95	0.72	0.44	1.12	0.84	0.83	2.71	1.02

Table C6 Raw data of weight loss of the blended hydrogels at 45 kGy in DW

CM-chitosan content (%w/w of PVA)	2 h	4 h	6 h	8 h	10 h	12 h	24 h	48 h
0	2.38	3.26	3.26	3.96	3.16	5.38	4.65	6.02
	1.18	2.35	2.30	3.53	3.45	4.30	5.32	5.32
	2.20	3.37	3.09	3.37	5.10	6.17	5.49	5.88
	2.15	2.25	3.03	4.17	4.26	4.08	6.02	7.69
	2.17	2.22	3.33	3.33	4.55	4.21	5.56	4.40
Avg.	2.02	2.69	3.00	3.67	4.10	4.83	5.41	5.86
SD	0.48	0.57	0.41	0.37	0.80	0.91	0.50	1.21
5	3.37	3.45	3.45	4.88	5.75	6.82	6.38	5.21
	3.16	4.17	4.90	3.16	5.68	6.00	4.76	5.38
	5.44	4.35	3.13	4.17	5.88	6.59	6.19	7.06
	3.16	3.92	3.92	4.60	5.75	6.10	6.02	6.38
	3.41	3.03	4.49	4.63	3.81	3.45	6.25	5.83
Avg.	3.71	3.78	3.98	4.29	5.37	5.79	5.92	5.97
SD	0.97	0.54	0.73	0.68	0.88	1.35	0.66	0.76
10	5.95	4.60	5.06	5.43	5.63	7.41	8.91	8.75
	6.85	5.32	5.75	5.26	8.14	6.76	7.78	6.85
	5.62	5.13	6.52	6.25	6.02	7.78	6.17	7.32
	3.90	6.74	4.55	7.23	7.53	6.82	6.67	6.25
	3.57	4.76	7.25	7.06	5.41	7.23	6.02	7.87
Avg.	5.18	5.31	5.82	6.25	6.55	7.20	7.11	7.41
SD	1.30	0.85	1.09	0.90	1.22	0.42	1.22	0.96

Table C6(continue) Raw data of weight loss of the blended hydrogels at 45 kGy in DW

CM-chitosan content (%w/w of PVA)	2 h	4 h	6 h	8 h	10 h	12 h	24 h	48 h
15	6.02	6.02	8.96	7.06	8.25	6.82	6.52	6.73
	6.10	6.25	5.13	7.37	5.88	8.05	7.79	7.55
	6.45	5.88	5.95	6.82	7.79	7.50	7.06	7.69
	6.52	6.82	6.58	6.76	6.80	6.82	9.46	8.43
	4.65	6.10	5.41	6.15	7.41	8.24	7.41	8.54
Avg.	5.95	6.21	6.40	6.83	7.23	7.48	7.65	7.79
SD	0.76	0.36	1.53	0.45	0.92	0.66	1.12	0.74
20	6.96	6.94	6.25	7.41	9.33	8.33	8.70	8.33
	5.63	7.14	7.69	8.45	7.58	7.84	9.09	8.60
	5.77	6.17	7.95	7.41	8.42	7.94	7.35	7.58
	7.25	8.11	7.69	7.37	7.06	8.45	8.82	9.52
	7.14	6.98	8.00	7.46	7.25	8.20	8.00	8.82
Avg.	6.55	7.07	7.52	7.62	7.93	8.15	8.39	8.57
SD	0.78	0.69	0.72	0.47	0.94	0.26	0.71	0.71

Appendix D Experimental data of moisture retention capability studies

Table D1 Raw data of moisture retention capability of the blended hydrogels at 25 kGy

CM-chitosan content (%w/w of PVA)	3 h	6 h	9 h	12 h	24 h	48 h	72 h
0	76.21	55.39	38.04	23.02	11.53	10.60	10.41
	77.22	56.98	39.86	24.65	11.49	10.68	10.43
	79.08	60.82	44.26	28.94	12.16	10.67	10.52
	81.32	64.63	48.54	33.20	13.27	10.69	10.51
	82.00	65.41	49.42	33.82	13.01	10.69	10.54
Avg.	79.17	60.65	44.02	28.72	12.29	10.67	10.48
SD	2.51	4.47	5.07	4.88	0.82	0.04	0.05
5	75.42	53.39	35.63	20.65	11.40	10.75	10.75
	75.66	54.32	36.01	21.83	11.41	10.86	10.72
	76.27	55.54	37.92	23.42	11.60	10.87	10.76
	77.59	57.27	39.05	23.87	11.49	10.77	10.59
	80.07	61.89	45.48	29.90	12.49	11.10	10.88
Avg.	77.00	56.48	38.83	23.93	11.68	10.87	10.74
SD	1.91	3.35	3.98	3.57	0.46	0.14	0.11
10	75.95	53.80	36.29	21.92	11.82	11.21	11.08
	76.29	55.19	37.23	23.05	11.83	11.19	11.08
	78.16	58.18	41.01	25.95	12.02	11.28	11.14
	78.6	59.18	41.96	27.01	12.50	11.40	11.36
	81.01	63.62	47.46	32.12	12.85	11.39	11.28
Avg.	78.00	57.99	40.79	26.01	12.20	11.29	11.19
SD	2.04	3.83	4.43	3.99	0.46	0.10	0.13

Table D1(continue) Raw data of moisture retention capability of the blended hydrogels at 25 kGy

CM-chitosan content (%w/w of PVA)	3 h	6 h	9 h	12 h	24 h	48 h	72 h
15	72.92	48.94	30.18	17.22	11.38	11.00	10.93
	73.18	50.67	32.00	18.59	11.54	11.10	11.15
	73.33	49.78	30.67	17.53	11.49	11.11	11.11
	75.69	53.95	36.82	22.84	11.88	11.29	11.16
	77.24	56.38	38.66	24.49	12.05	11.27	11.19
Avg.	74.47	51.94	33.66	20.13	11.67	11.29	11.11
SD	1.91	3.12	4.43	3.31	0.28	0.12	0.12
20	72.74	50.63	32.79	19.67	12.66	12.24	12.01
	77.28	57.33	39.76	24.88	12.80	12.03	11.87
	75.92	53.56	34.39	20.12	12.46	11.98	11.94
	78.59	58.83	38.98	23.60	12.48	11.94	11.91
	78.82	60.12	42.12	27.04	13.12	12.26	12.06
Avg.	76.67	56.10	37.61	23.06	12.70	12.09	11.96
SD	2.48	3.92	3.92	3.15	0.27	0.15	0.08

Table D2 Raw data of moisture retention capability of the blended hydrogels at 35 kGy

CM-chitosan content (%w/w of PVA)	3 h	6 h	9 h	12 h	24 h	48 h	72 h
0	81.03	64.97	49.04	33.05	12.26	10.55	10.44
	81.16	65.66	49.68	33.63	12.63	10.69	10.45
	82.05	67.33	52.42	36.85	13.03	10.60	10.46
	82.05	66.86	52.08	36.05	12.67	10.90	10.57
	82.57	68.29	53.67	37.88	13.66	10.65	10.44
Avg.	81.77	66.62	51.37	35.49	12.85	10.68	10.47
SD	0.66	1.32	1.94	2.08	0.53	0.13	0.06
5	83.86	69.57	54.81	39.42	15.76	11.21	10.92
	84.23	70.13	55.85	40.84	16.08	11.27	10.96
	84.88	71.52	57.85	43.01	16.35	11.16	10.88
	83.85	69.71	55.45	39.97	15.16	11.19	10.91
	82.92	68.21	53.82	38.24	14.13	11.10	10.88
Avg.	83.95	69.83	55.55	40.30	15.49	11.19	10.91
SD	0.71	1.19	1.49	1.78	0.89	0.07	0.03
10	80.91	63.74	47.002	31.15	12.72	11.44	11.25
	80.39	62.78	46.088	30.24	12.57	11.43	11.27
	81.45	64.88	48.825	32.84	12.82	11.53	11.34
	82.01	66.01	50.817	34.93	13.04	11.39	11.24
	75.69	60.71	47.081	32.23	12.15	10.60	10.51
Avg.	80.09	63.62	47.96	32.27	12.66	11.28	11.12
SD	2.54	2.03	1.88	1.79	0.33	0.38	0.34

Table D2(continue) Raw data of moisture retention capability of the blended hydrogels at 35 kGy

CM-chitosan content (%w/w of PVA)	3 h	6 h	9 h	12 h	24 h	48 h	72 h
15	88.20	70.17	52.30	34.88	14.21	12.59	12.36
	65.25	52.28	39.66	27.48	10.92	9.28	9.138
	62.75	51.55	40.49	29.36	11.45	8.84	8.664
	87.91	72.45	57.50	41.34	15.33	12.26	12.02
	82.72	67.08	53.31	37.83	14.50	11.68	11.57
Avg.	86.28	69.90	50.33	46.56	14.68	12.18	11.98
SD	3.08	2.69	8.07	3.24	0.58	0.46	0.40
20	79.89	62.17	45.59	30.19	13.48	12.129	11.95
	81.26	64.18	47.87	32.32	13.61	12.27	12.11
	82.36	66.1	51.10	35.94	15.05	12.332	12.05
	83.74	68.7	54.88	40.04	16.14	12.251	11.99
	82.80	66.97	52.99	37.70	14.47	12.216	12.00
Avg.	82.01	65.62	50.49	35.24	14.55	12.24	12.02
SD	1.48	2.53	3.77	3.99	1.10	0.07	0.06

Table D3 Raw data of moisture retention capability of the blended hydrogels at 45 kGy

CM-chitosan content (%w/w of PVA)	3 h	6 h	9 h	12 h	24 h	48 h	72 h
0	81.26	65.62	50.11	36.37	13.94	10.58	10.34
	80.32	63.48	46.96	30.28	12.01	10.49	10.37
	79.39	61.95	45.41	28.70	11.83	10.41	10.3
	81.68	65.64	50.37	33.69	12.66	10.54	10.37
	80.51	64.02	49.32	32.55	12.13	10.47	10.32
Avg.	80.63	64.14	48.43	32.32	12.51	10.50	10.34
SD	0.89	1.56	2.16	2.98	0.85	0.06	0.03
5	81.93	66.21	50.03	33.11	13.02	10.68	10.47
	82.54	67.40	51.81	35.37	13.74	10.73	10.46
	81.84	65.56	49.57	32.69	12.79	10.69	10.48
	83.25	68.46	53.92	37.78	14.62	11.02	10.7
	83.00	68.07	54.81	38.84	14.43	10.87	10.58
Avg.	82.51	67.14	52.03	35.56	13.72	10.80	10.54
SD	0.63	1.23	1.23	2.74	0.82	0.14	0.10
10	83.07	67.86	52.21	35.44	13.89	10.92	10.74
	81.92	66.05	50.40	33.99	13.01	10.89	10.65
	80.21	63.81	46.80	29.63	12.06	10.76	10.59
	80.25	63.15	47.06	30.33	12.05	10.63	10.48
	80.01	62.67	48.11	31.22	11.97	10.81	10.64
Avg.	81.09	64.71	48.92	32.12	12.60	10.80	10.62
SD	1.35	2.19	2.33	2.49	0.84	0.11	0.09

TableD3(continue) Raw data of moisture retention capability of the blended hydrogels at 45 kGy

CM-chitosan content (%w/w of PVA)	3 h	6 h	9 h	12 h	24 h	48 h	72 h
15	79.08	61.08	42.67	25.21	11.66	10.92	10.79
	77.79	59.36	42.08	25.28	11.67	11.00	10.75
	79.62	61.86	45.57	28.95	12.44	11.02	10.87
	73.98	53.18	34.72	18.48	11.24	10.24	10.71
	82.63	66.78	52.99	36.36	13.85	11.10	10.79
Avg.	78.62	60.45	43.60	26.86	12.17	10.86	10.78
SD	3.14	4.91	6.60	6.52	1.03	0.35	0.06
20	84.91	71.65	54.49	37.24	14.07	11.02	10.81
	81.88	66.27	49.55	32.94	13.05	10.90	10.73
	80.54	64.48	49.10	32.33	12.98	11.05	10.85
	80.63	63.96	47.83	31.06	12.54	10.97	10.81
	78.69	60.57	45.03	27.93	11.92	10.82	10.78
Avg.	81.33	65.39	49.20	32.30	12.91	10.95	10.80
SD	2.30	4.07	3.44	3.37	0.79	0.09	0.04

Figure D1 Water losing rate of the blended hydrogels at 25 kGy.

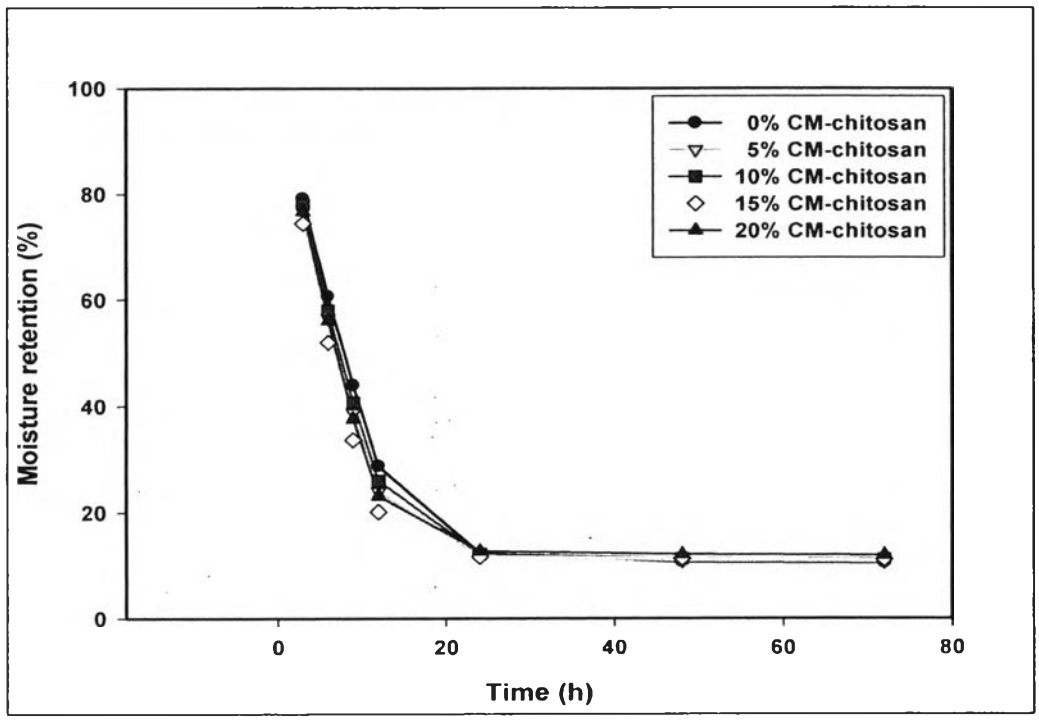


Figure D2 Water losing rate of the blended hydrogels at 35 kGy.

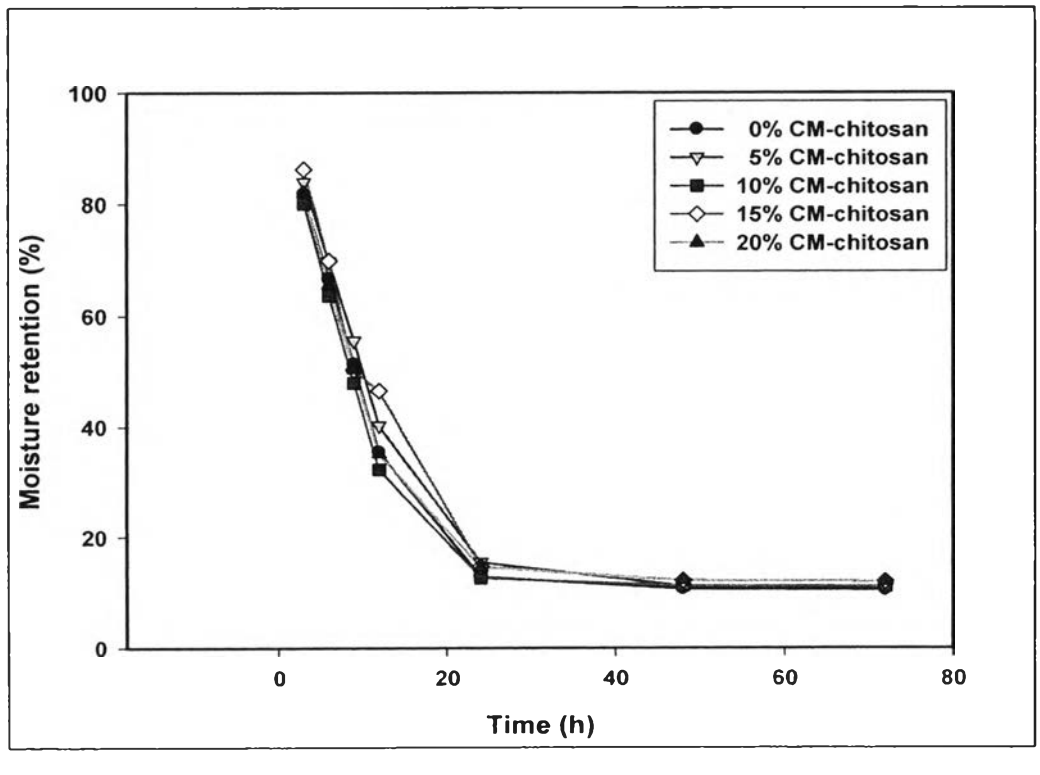
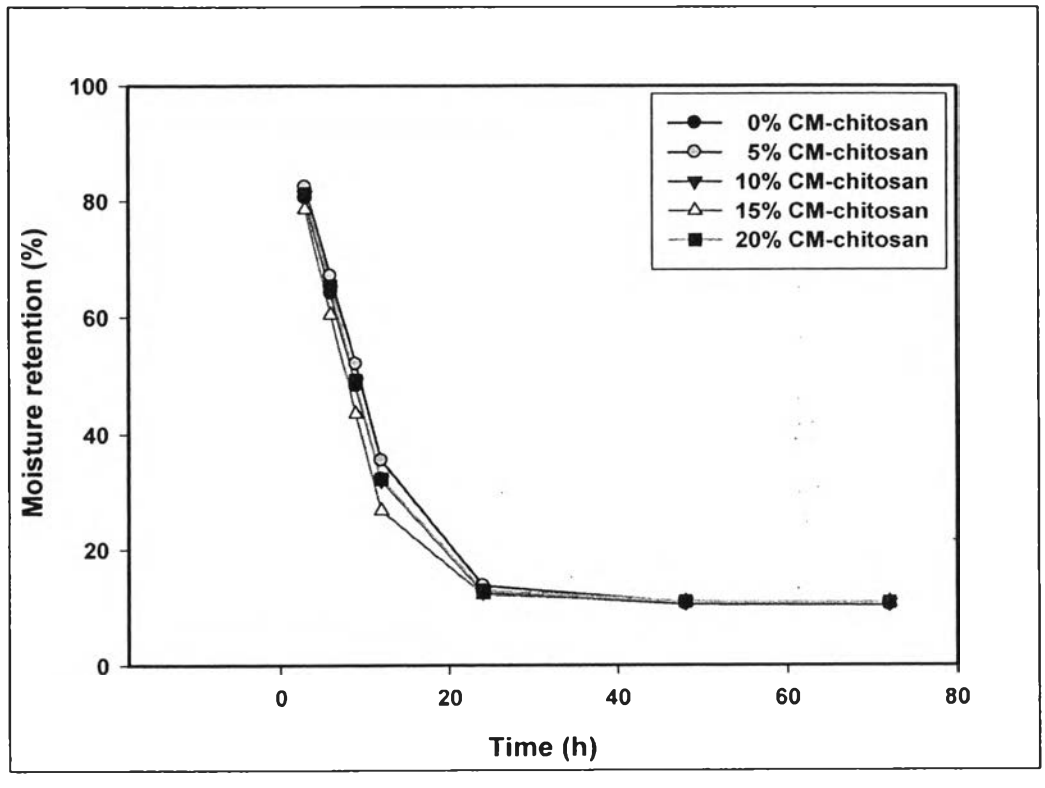


Figure D3 Water losing rate of the blended hydrogels at 45 kGy.



Appendix E Experimental Data of Water Absorption Studies

Table E1 Raw data of water absorption of the blended hydrogels

CM-chitosan content (%w/w of PVA)	Water Absorption (%)		
	25 kGy	35 kGy	45 kGy
0	136.00	147.13	132.31
	135.64	137.11	137.00
	137.19	143.75	148.11
	139.82	134.86	140.56
Avg.	137.16	140.71	139.50
SD	1.89	5.70	6.67
5	171.52	141.77	156.88
	185.82	143.31	180.00
	191.04	144.23	152.98
	191.20	141.78	162.60
Avg.	184.90	142.77	163.12
SD	9.26	1.21	11.9
10	224.82	178.88	190.98
	169.60	178.51	179.59
	231.97	181.82	179.82
	210.19	187.85	186.59
Avg.	222.33	181.76	184.25
SD	27.90	3.39	5.54
15	306.28	268.59	191.87
	339.20	274.81	204.55
	289.14	260.65	200.00
	-	274.03	200.00
Avg.	311.54	269.52	199.10
SD	25.40	6.00	5.28
20	402.31	331.58	241.54
	392.43	340.44	243.57
	413.33	334.01	251.11
	396.30	348.65	235.20
Avg.	401.09	338.67	242.86
SD	9.12	7.97	7.15

Appendix F Experimental Data of Molecular Weight Between Crosslink of The Blended Hydrogels Studies

Table F1 Raw data of molecular weight between crosslink of the blended hydrogels

CM-chitosan content (%w/w of PVA)	γ-irradiation doses (kGy)	υ_s	d_p
0	25	0.402	0.111
	35	0.416	
	45	0.418	
5	25	0.351	0.112
	35	0.375	
	45	0.381	
10	25	0.326	0.112
	35	0.355	
	45	0.372	
15	25	0.244	0.113
	35	0.271	
	45	0334	
20	25	0.200	0.114
	35	0.228	
	45	0.292	

Appendix G Experimental Data of Water Vapor Transmission Rate Studies

Table G1 Raw data of water vapor transmission rate of the blended hydrogels

CM-chitosan content (%w/w of PVA)	Water Vapor Transmission Rate (gm^2/h)		
	25 kGy	35 kGy	45 kGy
0	326.37	238.67	147.20
	359.76	363.37	129.00
	374.73	287.15	145.63
	329.51	318.46	138.54
	359.57	367.89	141.33
Avg.	349.99	315.11	140.34
SD	21.07	45.57	7.21
5	414.64	274.31	192.01
	338.33	290.54	165.87
	359.98	252.69	172.77
	358.10	310.75	178.61
	338.64	306.38	144.09
Avg.	361.94	286.93	170.67
SD	31.21	23.93	17.69
10	398.92	388.94	201.73
	374.07	288.28	178.51
	400.90	326.31	167.12
	345.14	366.94	187.77
	405.42	341.28	194.83
Avg.	384.89	342.35	186.00
SD	25.57	38.59	13.61
15	429.58	306.04	183.13
	351.66	234.27	174.06
	376.83	289.82	172.18
	379.46	253.45	177.54
	384.39	287.93	169.32
Avg.	384.39	274.3	175.24
SD	28.26	29.46	5.323
20	385.14	259.16	169.54
	318.43	300.64	180.33
	329.95	292.33	186.27
	401.62	303.5	176.22
	326.65	307.2	206.66
Avg.	352.36	292.56	183.80
SD	38.13	19.46	14.16

Appendix H Experimental Data of Indirect Cytotoxicity Studies

Table H1 Raw data of indirect cytotoxicity of the blended hydrogels (PVA/CM-chitosan), determined the viability of cells by MTT assay method at 570 nm

CM-chitosan content (%w/w of PVA)	Absorbance at 570 nm		
	1 day	2 day	3 day
control	0.179	0.192	0.197
	0.159	0.194	0.193
	0.193	0.226	0.213
Avg.	0.177	0.204	0.201
% viability of cells	100.000	115.254	113.559
SD	1.708	1.907	1.058
0	0.191	0.21	0.223
	0.200	0.189	0.237
	0.203	0.226	0.294
Avg.	0.198	0.208	0.251
% viability of cells	111.864	117.702	141.996
SD	0.624	1.855	3.761
5	0.208	0.236	0.251
	0.191	0.223	0.226
	0.234	0.259	0.245
Avg.	0.211	0.239	0.241
% viability of cells	119.209	135.217	135.970
SD	2.166	1.823	1.305
10	0.223	0.218	0.197
	0.213	0.221	-
	0.215	0.225	0.258
Avg.	0.217	0.221	0.228
% viability of cells	122.599	125.047	128.531
SD	0.529	0.351	9.646
15	0.248	0.238	-
	0.231	0.235	0.219
	0.230	0.211	0.213
Avg.	0.236	0.228	0.216
% viability of cells	133.522	128.813	122.034
SD	1.011	1.480	6.704
20	0.287	0.209	0.221
	0.243	0.230	0.256
	0.287	0.254	0.291
Avg.	0.272	0.231	0.256
% viability of cells	153.861	130.509	144.633
SD	2.540	2.252	3.500

Table H2 Raw data of indirect cytotoxicity of the blended hydrogels (PVA/CM-chitosan/TMC), determined the viability of cells by MTT assay method at 570 nm

TMC content (%w/w of PVA)	Absorbance at 570 nm	
	1 day	7 day
control	0.302	0.385
	0.316	0.394
	0.317	0.392
Avg.	0.312	0.390
% viability of cells	100.000	125.241
SD	0.839	0.472
0	0.257	0.372
	0.331	0.369
	0.306	0.402
Avg.	0.319	0.381
% viability of cells	102.193	122.246
SD	1.768	0.473
5	0.300	0.321
	0.316	0.332
	0.291	0.354
Avg.	0.302	0.336
% viability of cells	97.005	107.701
SD	1.266	1.680
10	0.312	0.367
	0.299	0.367
	0.271	-
Avg.	0.294	0.367
% viability of cells	94.332	117.754
SD	2.095	0
15	0.289	0.337
	0.295	0.336
	0.257	0.284
Avg.	0.292	0.337
% viability of cells	93.690	107.968
SD	0.424	0.071

Appendix I Experimental Data of Minimum Inhibitory Concentration Studies

Table I1 Raw data of minimum inhibitory concentration of *N*-trimethyl Chitosan Chloride (TMC) aginst bacteria in skin infection

Bacteria	Concentration of TMC (mg/ml)					
	10.0000	5.0000	2.5000	1.2500	0.6250	0.3125
Acinetobacter anitratus DMST 4183	-	+	+	+	+	+
Acinetobacter calcoaceticus ATCC 23055	-	-	-	-	+	+
Acinetobacter lwoffii ATCC 15309	-	-	-	-	+	+
Escherichia coli ATCC 25922	-	-	-	+	+	+
Escherichia coli ATCC 25922	-	0.5	+	+	+	+
Pseudomonas aeruginasa ATCC 27853	-	-	+	+	+	+
Staphylococcus aureus ATCC 25923	-	-	-	+	+	+
Staphylococcus aureus DMST 20654 (MRSA)	-	-	-	+	+	+
Staphylococcus epidermidis ATCC 12228	-	-	-	-	+	+
Streptococcus pyogenes DMST 17020	-	-	-	+	+	+
Listeria monocytogenes DMST 17303	-	-	-	+	+	+
Candida albican ATCC 10231	-	0.9	+	+	+	+

Table I2 Raw data of minimum inhibitory concentration of carboxymethyl chitosan (CM-chitosan) aginst bacteria in skin infection

Bacteria	Concentration of CM-chitosan (mg/ml)					
	10.0000	5.0000	2.5000	1.2500	0.6250	0.3125
Acinetobacter anitratus DMST 4183	-	-	+	+	+	+
Acinetobacter calcoaceticus ATCC 23055	-	-	-	0.4	+	+
Acinetobacter lwoffii ATCC 15309	-	-	-	-	+	+
Escherichia coli ATCC 25922	-	-	-	+	+	+
Escherichia coli ATCC 25922 (DMST 4212)	-	-	-	+	+	+
Pseudomonas aeruginasa ATCC 27853	-	-	-	+	+	+
Staphylococcus aureus ATCC 25923	-	-	-	+	+	+
Staphylococcus aureus DMST 20654 (MRSA)	-	-	-	+	+	+
Staphylococcus epidermidis ATCC 12228	-	-	-	-	+	+
Streptococcus pyogenes DMST 17020	-	-	-	+	+	+
Listeria monocytogenes DMST 17303	-	-	-	+	+	+
Candida albican ATCC 10231	-	-	+	+	+	+

Appendix J Experimental data of colony count studies

Table J1 Raw data of colony forming unit (CFU/ml) of the blended hydrogels (PVA/CM-chitosan) aginst *Acinetobacter Iwoffii* ATCC 15309

CM-chitosan content (%w/w of PVA)	CFU/ml 1st	CFU/ml 2nd	Avg.	SD
0	9.00×10^8	1.10×10^9	1.00×10^9	0.14×10^9
5	1.40×10^4	1.23×10^4	1.32×10^4	0.12×10^4
10	5.00×10^2	5.30×10^2	5.15×10^2	0.21×10^2
15	3.70×10^2	3.70×10^2	3.70×10^2	-
20	1.00×10^2	1.00×10^2	1.00×10^2	-

Table J2 Raw data of bacteria reduction rate (BRR) of the blended hydrogels (PVA/CM-chitosan) aginst *Acinetobacter Iwoffii* ATCC 15309

CM-chitosan content (%w/w of PVA)	Bacteria (cells) 1st	Bacteria (cells) 2nd	Avg.	SD	BRR
0	9.00×10^7	1.10×10^8	1.00×10^8	0.14×10^8	-
5	1.40×10^3	1.23×10^3	1.32×10^3	0.12×10^3	99.99
10	5.00×10	5.30×10	5.15×10	0.21×10	99.99
15	3.70×10	-	3.70×10	-	99.99
20	1.00×10	-	1.00×10	-	99.99

Table J3 Raw data of colony forming unit (CFU/ml) of the blended hydrogels (PVA/CM-chitosan) aginst *Escherichia coli* ATCC 25922

CM-chitosan content (%w/w of PVA)	CFU/ml 1st	CFU/ml 2nd	Avg.	SD
0	3.00×10^{10}	2.54×10^{10}	2.77×10^{10}	0.33×10^{10}
5	2.50×10^{10}	2.86×10^{10}	2.68×10^{10}	0.25×10^{10}
10	1.70×10^{10}	1.91×10^{10}	1.81×10^{10}	0.14×10^{10}
15	1.20×10^9	1.14×10^9	1.17×10^9	0.04×10^9
20	2.40×10^7	2.86×10^7	2.63×10^7	0.33×10^7

Table J4 Raw data of bacteria reduction rate (BRR) of the blended hydrogels (PVA/CM-chitosan) aginst *Escherichia coli* ATCC 25922

CM-chitosan content (%w/w of PVA)	Bacteria (cells) 1st	Bacteria (cells) 2nd	Avg.	SD	BRR
0	3.00×10^9	2.54×10^9	2.77×10^9	3.25×10^9	-
5	2.50×10^9	2.86×10^9	2.68×10^9	2.54×10^9	3.25
10	1.70×10^9	1.91×10^9	1.81×10^9	1.48×10^9	34.38
15	1.20×10^9	1.14×10^9	1.17×10^9	0.42×10^9	57.76
20	2.40×10^7	2.86×10^7	2.63×10^7	0.32×10^7	99.05

Table J5 Raw data of colony forming unit (CFU/ml) of the blended hydrogels (PVA/CM-chitosan) aginst *Staphylococcus aureus* ATCC 25923

CM-chitosan content (%w/w of PVA)	CFU/ml 1st	CFU/ml 2nd	Avg.	SD
0	3.40×10^{10}	2.98×10^{10}	3.19×10^{10}	0.29×10^{10}
5	1.60×10^{10}	1.84×10^{10}	1.72×10^{10}	0.16×10^{10}
10	1.20×10^{10}	1.16×10^{10}	1.18×10^{10}	0.03×10^{10}
15	6.00×10^9	7.00×10^9	6.50×10^9	0.71×10^9
20	5.00×10^3	4.80×10^3	4.90×10^3	0.14×10^3

Table J6 Raw data of bacteria reduction rate (BRR) of the blended hydrogels (PVA/CM-chitosan) aginst *Staphylococcus aureus* ATCC 25923

CM-chitosan content (%w/w of PVA)	Bacteria (cells) 1st	Bacteria (cells) 2nd	Avg.	SD	BRR
0	3.40×10^9	2.98×10^9	3.19×10^9	0.30×10^9	-
5	1.60×10^9	1.84×10^9	1.72×10^9	0.17×10^9	46.08
10	1.20×10^9	1.16×10^9	1.81×10^9	0.28×10^9	63.01
15	6.00×10^8	7.00×10^8	6.50×10^8	0.71×10^8	79.62
20	5.00×10^2	4.80×10^2	4.90×10^2	0.14×10^2	99.99

Table J7 Raw data of colony forming unit (CFU/ml) of the blended hydrogels (PVA/CM-chitosan) aginst *Staphylococcus aureus* DMST 20654 (MRSA)

CM-chitosan content (%w/w of PVA)	CFU/ml 1st	CFU/ml 2nd	Avg.	SD
0	1.20×10^{9}	6.60×10^{8}	9.30×10^{8}	3.81×10^{8}
5	9.00×10^{8}	9.20×10^{8}	9.10×10^{8}	0.14×10^{8}
10	3.00×10^{8}	2.80×10^{8}	2.90×10^{8}	0.14×10^{8}
15	6.60×10^{7}	1.20×10^{7}	9.30×10^{7}	3.82×10^{7}
20	3.80×10^{5}	3.70×10^{5}	3.75×10^{5}	0.07×10^{5}

Table J8 Raw data of bacteria reduction rate (BRR) of the blended hydrogels (PVA/CM-chitosan) aginst *Staphylococcus aureus* DMST 20654 (MRSA)

CM-chitosan content (%w/w of PVA)	Bacteria (cells) 1st	Bacteria (cells) 2nd	Avg.	SD	BRR
0	1.20×10^{8}	6.60×10^{7}	9.30×10^{7}	3.81×10^{7}	-
5	9.00×10^{7}	9.20×10^{7}	9.10×10^{7}	0.14×10^{7}	2.20
10	3.00×10^{7}	2.80×10^{7}	2.90×10^{7}	0.14×10^{7}	68.82
15	6.60×10^{6}	1.20×10^{7}	9.30×10^{6}	3.82×10^{6}	90.00
20	3.80×10^{4}	3.70×10^{4}	3.75×10^{4}	0.07×10^{4}	99.96

Table J9 Raw data of colony forming unit (CFU/ml) of the blended hydrogels (PVA/CM- chitosan) aginst *Staphylococcus epidermidis* ATCC 12228

CM-chitosan content (%w/w of PVA)	CFU/ml 1st	CFU/ml 2nd	Avg.	SD
0	1.10×10^{10}	1.38×10^{10}	1.24×10^{10}	0.20×10^{10}
5	8.76×10^{6}	8.40×10^{6}	8.58×10^{6}	0.25×10^{6}
10	2.00×10^{2}	1.30×10^{2}	1.65×10^{2}	0.49×10^{2}
15	0	0	-	-
20	0	0	-	-

Table J10 Raw data of bacteria reduction rate (BRR) of the blended hydrogels (PVA/CM- chitosan) aginst *Staphylococcus epidermidis* ATCC 12228

CM-chitosan content (%w/w of PVA)	Bacteria (cells) 1st	Bacteria (cells) 2nd	Avg.	SD	BRR
0	1.10×10^9	1.38×10^9	1.24×10^9	0.20×10^9	-
5	8.76×10^5	8.40×10^5	8.58×10^5	0.25×10^5	99.96
10	2.00×10	1.30×10	1.65×10	0.49×10	99.99
15	0	0	-	-	100.00
20	0	0	-	-	100.00

Table J11 Raw data of colony forming unit (CFU/ml) of the blended hydrogels (PVA/CM- chitosan) aginst *Listeria monocytogenes* DMST 17303

CM-chitosan content (%w/w of PVA)	CFU/ml 1st	CFU/ml 2nd	Avg.	SD
0	2.00×10^9	1.80×10^9	1.75×10^9	0.28×10^9
5	2.00×10^5	1.95×10^5	1.98×10^5	0.03×10^5
10	6.00×10^4	8.60×10^4	7.30×10^4	1.84×10^4
15	3.70×10^4	3.68×10^4	3.96×10^4	0.01×10^4
20	5.00×10	-	5.00×10	-

Table J12 Raw data of bacteria reduction rate (BRR) of the blended hydrogels (PVA/CM- chitosan) aginst *Listeria monocytogenes* DMST 17303

CM-chitosan content (%w/w of PVA)	Bacteria (cells) 1st	Bacteria (cells) 2nd	Avg.	SD	BRR
0	2.00×10^8	1.80×10^{98}	1.75×10^8	0.28×10^8	-
5	2.00×10^4	1.95×10^4	1.98×10^4	0.03×10^4	99,98
10	6.00×10^3	8.60×10^3	7.30×10^3	1.84×10^3	99.99
15	3.70×10^3	3.68×10^3	3.96×10^3	0.01×10^3	99.99
20	5.00×10^0	-	5.00×10^0	-	99.99

Table J13 Raw data of colony forming unit (CFU/ml) of the blended hydrogels (PVA/CM-chitosan/TMC) aginst *Acinetobacter Iwoffii* ATCC 15309

CM-chitosan content (%w/w of PVA)	CFU/ml 1st	CFU/ml 2nd	Avg.	SD
Control	8.00×10^8	9.80×10^8	8.90×10^8	1.27×10^8
0	0	0	0	-
5	0	0	0	-
10	0	0	0	-
15	0	0	0	-

Table J14 Raw data of bacteria reduction rate (BRR) of the blended hydrogels (PVA/CM-chitosan/TMC) aginst *Acinetobacter Iwoffii* ATCC 15309

CM-chitosan content (%w/w of PVA)	Bacteria (cells) 1st	Bacteria (cells) 2nd	Avg.	SD	BRR
Control	8.00×10^8	9.80×10^8	8.90×10^8		1.27×10^8
0	0	0	0	-	100.00
5	0	0	0	-	100.00
10	0	0	0	-	100.00
15	0	0	0	-	100.00

Table J15 Raw data of colony forming unit (CFU/ml) of the blended hydrogels (PVA/CM-chitosan/TMC) aginst *Escherichia coli* ATCC 25922

CM-chitosan content (%w/w of PVA)	CFU/ml 1st	CFU/ml 2nd	Avg.	SD
Control	1.30×10^{10}	1.51×10^{10}	1.41×10^{10}	0.14×10^{10}
0	1.20×10^{10}	1.14×10^{10}	1.17×10^{10}	0.04×10^{10}
5	7.00×10^9	8.00×10^9	7.50×10^9	0.71×10^9
10	2.00×10^9	2.67×10^9	2.34×10^9	0.47×10^9
15	6.40×10^8	5.97×10^8	6.19×10^8	0.30×10^8

Table J16 Raw data of bacteria reduction rate (BRR) of the blended hydrogels (PVA/CM-chitosan/TMC) aginst *Escherichia coli* ATCC 25922

CM-chitosan content (%w/w of PVA)	Bacteria (cells) 1st	Bacteria (cells) 2nd	Avg.	SD	BRR
Control	1.30×10^9	1.51×10^9	1.41×10^9	0.14×10^9	-
0	1.20×10^9	1.14×10^9	1.17×10^9	0.04×10^9	16.73
5	7.00×10^8	8.00×10^8	7.50×10^8	0.71×10^8	46.62
10	2.00×10^8	2.67×10^8	2.34×10^8	0.47×10^8	83.38
15	6.40×10^8	5.97×10^8	6.19×10^8	0.30×10^8	95.60

Table J17 Raw data of colony forming unit (CFU/ml) of the blended hydrogels (PVA/CM-chitosan/TMC) aginst *Staphylococcus aureus* ATCC 25923

CM-chitosan content (%w/w of PVA)	CFU/ml 1st	CFU/ml 2nd	Avg.	SD
Control	8.40×10^{10}	-	8.40×10^{10}	-
0	6.00×10^9	7.00×10^9	6.50×10^9	0.71×10^9
5	3.00×10^9	4.00×10^9	3.50×10^9	0.71×10^9
10	5.00×10^8	4.60×10^8	2.34×10^8	0.28×10^8
15	2.00×10^8	2.00×10^8	2.00×10^8	-

Table J18 Raw data of bacteria reduction rate (BRR) of the blended hydrogels (PVA/CM-chitosan/TMC) aginst *Staphylococcus aureus* ATCC 25923

CM-chitosan content (%w/w of PVA)	Bacteria (cells) 1st	Bacteria (cells) 2nd	Avg.	SD	BRR
Control	8.40×10^9	-	8.40×10^9	-	-
0	6.00×10^8	7.00×10^8	6.50×10^8	0.71×10^8	92.26
5	3.00×10^8	4.00×10^8	3.50×10^7	0.71×10^8	95.83
10	5.00×10^7	4.60×10^8	2.34×10^7	0.28×10^7	99.43
15	2.00×10^7	2.00×10^7	2.00×10^7	-	99.76

Table J19 Raw data of colony forming unit (CFU/ml) of the blended hydrogels (PVA/CM-chitosan/TMC) aginst *Staphylococcus aureus* DMST 20654 (MRSA)

CM-chitosan content (%w/w of PVA)	CFU/ml 1st	CFU/ml 2nd	Avg.	SD
Control	2.80×10^{10}	2.18×10^{10}	2.49×10^{10}	0.44×10^{10}
0	1.20×10^{9}	6.60×10^{8}	9.30×10^{8}	3.82×10^{8}
5	3.00×10^{8}	2.80×10^{8}	2.90×10^{8}	0.14×10^{8}
10	2.00×10^{7}	4.00×10^{7}	3.00×10^{7}	1.41×10^{7}
15	1.00×10^{7}	1.40×10^{7}	1.20×10^{7}	0.28×10^{7}

Table J20 Raw data of bacteria reduction rate (BRR) of the blended hydrogels (PVA/CM-chitosan/TMC) aginst *Staphylococcus aureus* DMST 20654 (MRSA)

CM-chitosan content (%w/w of PVA)	Bacteria (cells) 1st	Bacteria (cells) 2nd	Avg.	SD	BRR
Control	2.80×10^{9}	2.18×10^{9}	2.49×10^{9}	0.44×10^{9}	-
0	1.20×10^{8}	6.60×10^{7}	9.30×10^{7}	3.82×10^{7}	96.27
5	3.00×10^{7}	2.80×10^{7}	2.90×10^{7}	0.14×10^{7}	98.84
10	2.00×10^{6}	4.00×10^{6}	3.00×10^{6}	1.41×10^{6}	99.88
15	1.00×10^{6}	1.40×10^{6}	1.20×10^{6}	0.28×10^{6}	99.95

Table J21 Raw data of colony forming unit (CFU/ml) of the blended hydrogels (PVA/CM-chitosan/TMC) aginst *Staphylococcus epidermidis* ATCC 12228

CM-chitosan content (%w/w of PVA)	CFU/ml 1st	CFU/ml 2nd	Avg.	SD
Control	7.00×10^{10}	-	7.00×10^{10}	-
0	0	0	0	-
5	0	0	0	-
10	0	0	0	-
15	0	0	0	-

Table J22 Raw data of bacteria reduction rate (BRR) of the blended hydrogels (PVA/CM-chitosan/TMC) aginst *Staphylococcus epidermidis* ATCC 12228

CM-chitosan content (%w/w of PVA)	Bacteria (cells) 1st	Bacteria (cells) 2nd	Avg.	SD	BRR
Control	7.00×10^9	-	7.00×10^9	-	-
0	0	0	0	-	100.00
5	0	0	0	-	100.00
10	0	0	0	-	100.00
15	0	0	0	-	100.00

Table J23 Raw data of colony forming unit (CFU/ml) of the blended hydrogels (PVA/CM-chitosan/TMC) aginst *Listeria monocytogenes* DMST 17303

CM-chitosan content (%w/w of PVA)	CFU/ml 1st	CFU/ml 2nd	Avg.	SD
Control	3.00×10^9	2.00×10^9	2.50×10^9	0.71×10^9
0	3.70×10^4	3.68×10^4	3.69×10^4	0.04×10^4
5	7.00×10^3	7.80×10^3	7.40×10^3	0.57×10^3
10	1.00×10^3	1.00×10^3	1.00×10^3	-
15	0	0	0	-

Table J24 Raw data of bacteria reduction rate (BRR) of the blended hydrogels (PVA/CM-chitosan/TMC) aginst *Listeria monocytogenes* DMST 17303

CM-chitosan content (%w/w of PVA)	Bacteria (cells) 1st	Bacteria (cells) 2nd	Avg.	SD	BRR
Control	3.00×10^8	2.00×10^8	2.50×10^8	0.71×10^8	-
0	3.70×10^3	3.68×10^3	3.69×10^3	0.04×10^3	99.99
5	7.00×10^2	7.80×10^2	7.40×10^2	0.57×10^2	99.99
10	1.00×10^2	1.00×10^2	1.00×10^2	-	99.99
15	0	0	0	-	100.00

CURRICULUM VITAE

Name: Ms. Nundhawan Nidhiprabhawat

Date of Birth: April 14, 1986

Nationality: Thai

University Education:

2005-2008 Bachelor's Degree in Industrial Chemistry, Faculty of Applied Science, King Mongkut's University of Technology North Bangkok, Bangkok, Thailand

Proceedings:

1. Nidhiprabhawat, N., Supaphol, P. (2011, April 26). Radiation Synthesis of A Novel Antibacterial Hydrogels as Wound Dressing. Proceedings of the 17th PPC Symposium on Petroleum, Petrochems, and Polymers, Bangkok, Thailand.

Presentations:

1. Nidhiprabhawat, N. ,Supaphol, P. (2011, April 26). Radiation Synthesis of A Novel Antibacterial Hydrogels as Wound Dressing. Poster presented at the 17th PPC Symposium on Petroleum, Petrochems, and Polymers, Bangkok, Thailand.