

NEWSLETTER

Editor: Martin G. Peter, University of **Potsdam**, Germany

E-mail Martin.Peter@uni-potsdam.de

<http://euchis.org>

• Editorial	2
• Conferences	3
• Message from MDPI - IJMS	3
• Advances in Chitin Science	4
• Special Issue: 12 th APCCS-14 th ICCC-2018 (citation of papers)	5
• Special Issue: Tribute to the Memory of Prof. George A.F. Roberts & Prof. Kjell M. Vårum (citation of papers)	9
• Handbook of Chitin and Chitosan: Contents	11



January 2021
No. 47

Editorial

Season's Greetings to all EUCHIS Members!

This Newsletter was prepared under unusual circumstances – just like all of us working and living with the restrictions Corona is enforcing on us.

We would like very much to announce news about the 14th EUCHIS conference, originally planned to take place in September 2020 in Kazan, Russia. But we had to accept that the conference needed to be postponed, initially hoping for an event in 2021. And now, we realize that fixing a date is still impossible, and we do not even dare to hope for 2021 anymore. Of course, we all hope that vaccination can be implemented for a major part of the global population fast, but it is uncertain when unrestricted travel will be possible again. As a consequence, the global schedule for chitin/chitosan conferences will need to be revised completely (see p. 3). A message from MDPI – IJMS is also reprinted on p. 3.

In spite of this unfortunate situation, we gladly communicate some of the results of our home office activities in the Newsletter. Four additional Volumes of *Advances in Chitin Science* were uploaded and are available open access as ZIP files on our web site. It may also be of interest to read a brief account of all EUCHIS conferences held up to date (p. 4). A collection of papers presented at 14th ICCC/12th APCCS in Osaka, Japan, August 2018, is published in *Int. J. Biol. Macromol.* (for citation of the papers, see p. 5). The Special Issue dedicated to the memory of Professors George A. F. Roberts and Kjell M. Vårum (see Newsletter # 44) was finalized and appeared in 2020 in *React. Funct. Polym.*, for citations of the articles, see p. 9). Last not least, a three volume *Handbook of Chitin and Chitosan*, focusing on production and applications of chitosan in materials science and biomedicine, was published by Elsevier, for citation of the Tables of Contents, see p. 11.

With our best wishes for a Happy, Healthy, Prosperous New Year 2021

and with our long-term hopes for a personal meeting at the latest in 2022 in Kazan

Bruno M. Moerschbacher, President
Martin G. Peter, Secretary

Conferences

The next chitin/chitosan conferences were planned originally according to the following schedule:

- 13th APCCS, June 2020, Korea;
- 14th EUCHIS, September 2020, Russia;
- 15th ICCC / 9th SIAQ, 2021, Mexico.

The possibility to organize EUCHIS 2020 as a virtual conference was discussed briefly in a virtual meeting of the organizer of EUCHIS 2020, the President plus Vice-Presidents, and the Secretary. Considering that the essentials of a conference are personal meetings with live communication and exchange of ideas, we opted against this possibility.

If we assume that none of the above-mentioned meetings will be realized in 2021, then 2022 would become a chitin meeting-overcrowded year indeed. We will be in contact with the organizers of these meetings and try to find a reasonable solution in this situation. Hopefully, you will find news about this in the next EUCHIS newsletter.

In any case, the next EUCHIS conference will be sponsored also by MDPI – IJMS. Of course, all travel grants approved already remain valid. EUCHIS has some additional resources available for supporting students, the call for applications remains open (see Newsletter No. 45). Qualified MSc and PhD students as well as Postdocs (up to two years post-PhD) may apply for travel grants. Nominations for the Braconnot Prize may be submitted any time until further notice.

A Message from MDPI - IJMS

Thanks for your attention on the European Chitin Society (EUCHIS) affiliated journal *“International Journal of Molecular Sciences”* (IJMS; ISSN 1422-0067; <http://www.mdpi.com/journal/ijms>).

We are pleased to report that IJMS received its new Impact Factor in the most recent version of the Journal Citation Report® (Clarivate Analytics). Based on citation activity in the Web of Science last year, the 2019 Impact Factor for IJMS is 4.556. IJMS now ranks 74/297 titles (Q1) in the category of “Biochemistry & Molecular Biology” and 48/177 (Q2) in the category of “Chemistry, Multidisciplinary”.

As the society collaborated journal, we sincerely invite you to contribute one paper in this year and enjoy the benefit of 15% on the article processing charges to publish in IJMS. All submissions are peer-reviewed, and accepted papers will be published immediately.

If you have any questions, please contact Dr. Xiaoshan Wan from the IJMS Editorial Office (xiaoshan.wan@mdpi.com).

Advances in Chitin Science

Four Volumes were added online since May 2020 (see Newsletter # 46) and are available under the terms of Creative Commons at <https://euchis.org/#chitin-science>. This brings the total number of publicly available Advances in Chitin Science to 11 out of 14 Volumes. Unfortunately, we could still not obtain permission from copyright owners to upload Volumes 5 (5th APCCS), 7 (9th ICCC), and 11 (9th EUCHIS, Venice, Italy, 2009). Proceedings of the 4th EUCHIS (Senigallia, Italy) conference were published as a Volume entitled “Chitosan in Chemistry and Pharmacy”. Advances in Chitin Science, Vol’s. 1 – 7 and 12 – 14 are indexed in ScienceFinder®.

Available volumes (newly added volumes marked with grey shadow)

- Vol. 1 1st EUCHIS, Brest, France, 1995
- Vol. 2 7th ICCC and 2nd EUCHIS, Lyon, France, 1997
- Vol. 3 3rd APCCS, Keelung, Taiwan, 1998
- Vol. 4 3rd EUCHIS, Potsdam, Germany, 1999
- Vol. 8 6th EUCHIS, Poznan, Poland, 2004
- Vol. 9 7th EUCHS and 10th ICCC, Montpellier, France, 2006
- Vol. 6 5th EUCHIS, Trondheim, Norway, 2002
- Vol. 10 8th EUCHIS, Antalya, Turkey, 2007
- Vol. 12 5th SIAQ, Santiago, Chile, 2010
- Vol. 13 10th EUCHIS, St. Petersburg, Russia, 2011
- Vol. 14 6th SIAQ and 12th ICCC, Fortaleza, Brasil, 2012

Concerning EUCHIS Conferences, most of the Proceedings are available available as Advances in Chitin Science or as publications in Journals:

No.	Location, Year	Proceedings	Availability
1 st	Brest, France, 1995	Advances in Chitin Science, Vol. 1	EUCHIS, online
2 nd	Lyon, France, 1997	Advances in Chitin Science, Vol. 2	EUCHIS, online
3 rd	Potsdam, Germany, 1999	Advances in Chitin Science, Vol. 4	EUCHIS, online
4 th	Senigallia, Italy, 2001	Book: Chitosan in Chemistry and Pharmacy	Not available
5 th	Trondheim, Norway, 2002	Advances in Chitin Science, Vol. 6	EUCHIS, online
6 th	Poznan, Poland, 2004	Advances in Chitin Science, Vol. 8	EUCHIS, online
7 th	Montpellier, France, 2006	Advances in Chitin Science, Vol. 9	EUCHIS, online
8 th	Antalya, Turkey, 2007	Advances in Chitin Science, Vol.10	EUCHIS, online
9 th	San Servolo, Venice, Italy, 2009	Advances in Chitin Science, Vol.11	Permission pending
10 th	St. Petersburg, Russia, 2011	Advances in Chitin Science, Vol.13	EUCHIS, online
11 th	Porto, Portugal, 2013	Not published	Not available

12 th	Münster, Germany, 2015	7 Papers published in <i>Pure Appl. Chem.</i> , Vol. 8, Issue 9 (2016), Special Issue "12 th International Conference of the European Chitin Society and 13 th International Conference on Chitin and Chitosan (EUCHIS/ICCC 2015)"	https://www.degruyter.com/view/journals/pac/88/9/article-p841.xml
13 th	Seville, Spain, 2017	5 papers published in <i>Molecules</i> , 2017 , Vol., 22, Issues 10, 11, and 12: Special Issue "Selected Papers from the 13 th International Conference of the European Chitin Society – 8 th Simposio de la Sociedad Iberoamericana de Quitina (EUCHIS-SIAQ 2017)"	https://www.mdpi.com/journal/molecules/special_issues/EUCHIS_SIAQ_2017#info
14 th	Kazan, Russia, 2020	postponed	

Special Issue: *International Journal of Biological Macromolecules*
Papers from the 12th APCCS-14th ICCC-2018, Kansai University, Suitama, Osaka, Japan, August 27 – 30, 2018

Editorial: Tamura, H.; Furuike, T.; Jayakumar, R., *Special issue: 12th APCCS-14th ICCC-2018-chemistry, environmental, biotechnology and biomedical aspects of chitin and chitosan*, *Int. J. Biol. Macromol.*, (2019) **141**, 387; <https://doi.org/10.1016/j.ijbiomac.2019.08.177>

1. Azuma, K.; Koizumi, R.; Izawa, H.; Morimoto, M.; Saimoto, H.; Osaki, T.; Ito, N.; Yamashita, M.; Tsuka, T.; Imagawa, T.; Okamoto, Y.; Inoue, T.; Ifuku, S., *Hair growth-promoting activities of chitosan and surface-deacetylated chitin nanofibers*, *Int. J. Biol. Macromol.*, (2019) **126**, 11-17; <https://doi.org/10.1016/j.ijbiomac.2018.12.135>
2. Nishida, S.; Shibano, M.; Kamitakahara, H.; Takano, T., *Basic study for acyl chitosan isothiocyanates synthesis by model experiments using glucosamine derivatives*, *Int. J. Biol. Macromol.*, (2019) **132**, 17-23; <https://doi.org/10.1016/j.ijbiomac.2019.03.114>
3. Egusa, M.; Parada, R.; Aklog, Y. F.; Ifuku, S.; Kaminaka, H., *Nanofibrillation enhances the protective effect of crab shells against Fusarium wilt disease in tomato*, *Int. J. Biol. Macromol.*, (2019) **128**, 22-27; <https://doi.org/10.1016/j.ijbiomac.2019.01.088>
4. Nivedhitha Sundaram, M.; Deepthi, S.; Mony, U.; Shalumon, K. T.; Chen, J.-P.; Jayakumar, R., *Chitosan hydrogel scaffold reinforced with twisted poly(l lactic acid) aligned microfibrous bundle to mimic tendon extracellular matrix*, *Int. J. Biol. Macromol.*, (2019) **122**, 37-44; <https://doi.org/10.1016/j.ijbiomac.2018.10.151>
5. Komoto, D.; Furuike, T.; Tamura, H., *Preparation of polyelectrolyte complex gel of sodium alginate with chitosan using basic solution of chitosan*, *Int. J. Biol. Macromol.*, (2019) **126**, 54-59; <https://doi.org/10.1016/j.ijbiomac.2018.12.195>
6. Xing, L.; Fan, Y.-T.; Shen, L.-J.; Yang, C.-X.; Liu, X.-Y.; Ma, Y.-N.; Qi, L.-Y.; Cho, K.-H.; Cho, C.-S.; Jiang, H.-L., *pH-sensitive and specific ligand-conjugated chitosan nanogels for efficient drug delivery*, *Int. J. Biol. Macromol.*, (2019) **141**, 85-97; <https://doi.org/10.1016/j.ijbiomac.2019.08.237>
7. Kurozumi, S.; Kiyose, M.; Noguchi, T.; Sato, K., *A novel hydrochloride-free chitosan oligosaccharide production method to improve taste*, *Int. J. Biol. Macromol.*, (2019) **140**, 109-118; <https://doi.org/10.1016/j.ijbiomac.2019.08.067>

8. Suwattanachai, P.; Pimkhaokham, A.; Chirachanchai, S., *Multi-functional carboxylic acids for chitosan scaffold*, *Int. J. Biol. Macromol.*, (2019) **134**, 156-164; <https://doi.org/10.1016/j.ijbiomac.2019.04.074>
9. Chang, S.-H.; Wu, G.-J.; Wu, C.-H.; Huang, C.-H.; Tsai, G.-J., *Oral administration with chitosan hydrolytic products modulates mitogen-induced and antigen-specific immune responses in BALB/c mice*, *Int. J. Biol. Macromol.*, (2019) **131**, 158-166; <https://doi.org/10.1016/j.ijbiomac.2019.02.068>
10. Chen, Y.-H.; Tai, H.-Y.; Fu, E.; Don, T.-M., *Guided bone regeneration activity of different calcium phosphate/chitosan hybrid membranes*, *Int. J. Biol. Macromol.*, (2019) **126**, 159-169; <https://doi.org/10.1016/j.ijbiomac.2018.12.199>
11. Chang, S.-H.; Lin, Y.-Y.; Wu, G.-J.; Huang, C.-H.; Tsai, G. J., *Effect of chitosan molecular weight on anti-inflammatory activity in the RAW 264.7 macrophage model*, *Int. J. Biol. Macromol.*, (2019) **131**, 167-175; <https://doi.org/10.1016/j.ijbiomac.2019.02.066>
12. Sirajudheen, P.; Meenakshi, S., *Facile synthesis of chitosan-La³⁺-graphite composite and its influence in photocatalytic degradation of methylene blue*, *Int. J. Biol. Macromol.*, (2019) **133**, 253-261; <https://doi.org/10.1016/j.ijbiomac.2019.04.073>
13. Cho, I. S.; Ooya, T., *Tuned cell attachments by double-network hydrogels consisting of glycol chitosan, carboxymethyl cellulose and agar bearing robust and self-healing properties*, *Int. J. Biol. Macromol.*, (2019) **134**, 262-268; <https://doi.org/10.1016/j.ijbiomac.2019.05.053>
14. Vigneshwaran, S.; Preethi, J.; Meenakshi, S., *Removal of chlorpyrifos, an insecticide using metal free heterogeneous graphitic carbon nitride (g-C₃N₄) incorporated chitosan as catalyst: Photocatalytic and adsorption studies*, *Int. J. Biol. Macromol.*, (2019) **132**, 289-299; <https://doi.org/10.1016/j.ijbiomac.2019.03.071>
15. Boles, L. R.; Bumgardner, J. D.; Fujiwara, T.; Haggard, W. O.; Guerra, F. D.; Jennings, J. A., *Characterization of trimethyl chitosan/polyethylene glycol derivatized chitosan blend as an injectable and degradable antimicrobial delivery system*, *Int. J. Biol. Macromol.*, (2019) **133**, 372-381; <https://doi.org/10.1016/j.ijbiomac.2019.04.075>
16. Karthikeyan, P.; Banu, H. A. T.; Meenakshi, S., *Synthesis and characterization of metal loaded chitosan-alginate biopolymeric hybrid beads for the efficient removal of phosphate and nitrate ions from aqueous solution*, *Int. J. Biol. Macromol.*, (2019) **130**, 407-418; <https://doi.org/10.1016/j.ijbiomac.2019.02.059>
17. Ng, I. S.; Song, C. P.; Ooi, C. W.; Tey, B. T.; Lee, Y.-H.; Chang, Y.-K., *Purification of lysozyme from chicken egg white using nanofiber membrane immobilized with Reactive Orange 4 dye*, *Int. J. Biol. Macromol.*, (2019) **134**, 458-468; <https://doi.org/10.1016/j.ijbiomac.2019.05.054>
18. Bharathi, D.; Ranjithkumar, R.; Chandarshekhar, B.; Bhuvaneshwari, V., *Bio-inspired synthesis of chitosan/copper oxide nanocomposite using rutin and their anti-proliferative activity in human lung cancer cells*, *Int. J. Biol. Macromol.*, (2019) **141**, 476-483; <https://doi.org/10.1016/j.ijbiomac.2019.08.235>
19. Preethi, J.; Vigneshwaran, S.; Meenakshi, S., *Performance of chitosan engraved iron and lanthanum mixed oxyhydroxide for the detoxification of hexavalent chromium*, *Int. J. Biol. Macromol.*, (2019) **130**, 491-498; <https://doi.org/10.1016/j.ijbiomac.2019.02.101>
20. Kumar, I. A.; Jeyaprabha, C.; Meenakshi, S.; Viswanathan, N., *Hydrothermal encapsulation of lanthanum oxide derived Aegle marmelos admixed chitosan bead system for nitrate and phosphate retention*, *Int. J. Biol. Macromol.*, (2019) **130**, 527-535; <https://doi.org/10.1016/j.ijbiomac.2019.02.106>
21. Cheah, W. Y.; Show, P.-L.; Ng, I. S.; Lin, G.-Y.; Chiu, C.-Y.; Chang, Y.-K., *Antibacterial activity of quaternized chitosan modified nanofiber membrane*, *Int. J. Biol. Macromol.*, (2019) **126**, 569-577; <https://doi.org/10.1016/j.ijbiomac.2018.12.193>
22. Banu, H. T.; Karthikeyan, P.; Meenakshi, S., *Zr⁴⁺ ions embedded chitosan-soya bean husk activated biochar composite beads for the recovery of nitrate and phosphate ions from aqueous solution*, *Int. J. Biol. Macromol.*, (2019) **130**, 573-583; <https://doi.org/10.1016/j.ijbiomac.2019.02.100>
23. Pandi, K.; Viswanathan, N.; Meenakshi, S., *Hydrothermal synthesis of magnetic iron oxide encrusted hydrocalumite-chitosan composite for defluoridation studies*, *Int. J. Biol. Macromol.*, (2019) **132**, 600-605; <https://doi.org/10.1016/j.ijbiomac.2019.03.115>
24. Ng, I. S.; Tang, M. S. Y.; Show, P. L.; Chiou, Z.-M.; Tsai, J.-C.; Chang, Y.-K., *Enhancement of C-phycocyanin purity using negative chromatography with chitosan-modified nanofiber membrane*, *Int. J. Biol. Macromol.*, (2019) **132**, 615-628; <https://doi.org/10.1016/j.ijbiomac.2019.03.235>

25. Tanimoto, S.; Nishii, I.; Kanaoka, S., *Biomineralization-inspired fabrication of chitosan/calcium carbonates core-shell type composite microparticles as a drug carrier*, *Int. J. Biol. Macromol.*, (2019) **129**, 659-664; <https://doi.org/10.1016/j.ijbiomac.2019.02.063>
26. Tran, T. H.; Nguyen, H.-L.; Hao, L. T.; Kong, H.; Park, J. M.; Jung, S.-H.; Cha, H. G.; Lee, J. Y.; Kim, H.; Hwang, S. Y.; Park, J.; Oh, D. X., *A ball milling-based one-step transformation of chitin biomass to organo-dispersible strong nanofibers passing highly time and energy consuming processes*, *Int. J. Biol. Macromol.*, (2019) **125**, 660-667; <https://doi.org/10.1016/j.ijbiomac.2018.12.086>
27. Aranaz, I.; Alcántara, A. R.; Heras, A.; Acosta, N., *Efficient reduction of Toluidine Blue O dye using silver nanoparticles synthesized by low molecular weight chitosans*, *Int. J. Biol. Macromol.*, (2019) **131**, 682-690; <https://doi.org/10.1016/j.ijbiomac.2019.03.119>
28. Doan, C. T.; Tran, T. N.; Nguyen, V. B.; Vo, T. P. K.; Nguyen, A. D.; Wang, S.-L., *Chitin extraction from shrimp waste by liquid fermentation using an alkaline protease-producing strain, *Brevibacillus parabrevis**, *Int. J. Biol. Macromol.*, (2019) **131**, 706-715; <https://doi.org/10.1016/j.ijbiomac.2019.03.117>
29. Pawaskar, G. M.; Pangannaya, S.; Raval, K.; Trivedi, D. R.; Raval, R., *Screening of chitin deacetylase producing microbes from marine source using a novel receptor on agar plate*, *Int. J. Biol. Macromol.*, (2019) **131**, 716-720; <https://doi.org/10.1016/j.ijbiomac.2019.03.118>
30. Shanmuganathan, R.; Edison, T. N. J. I.; LewisOscar, F.; Kumar, P.; Shanmugam, S.; Pugazhendhi, A., *Chitosan nanopolymers: An overview of drug delivery against cancer*, *Int. J. Biol. Macromol.*, (2019) **130**, 727-736; <https://doi.org/10.1016/j.ijbiomac.2019.02.060>
31. Kadokawa, J.-i., *Dissolution, derivatization, and functionalization of chitin in ionic liquid*, *Int. J. Biol. Macromol.*, (2019) **123**, 732-737; <https://doi.org/10.1016/j.ijbiomac.2018.11.165>
32. Li, K.; Green, A. R.; Dinges, M. M.; Larive, C. K., *¹H NMR characterization of chitin tetrasaccharide in binary H₂O:DMSO solution: Evidence for anomeric end-effect propagation*, *Int. J. Biol. Macromol.*, (2019) **129**, 744-749; <https://doi.org/10.1016/j.ijbiomac.2019.02.062>
33. Nagaoka, I.; Tsuruta, A.; Yoshimura, M., *Chondroprotective action of glucosamine, a chitosan monomer, on the joint health of athletes*, *Int. J. Biol. Macromol.*, (2019) **132**, 795-800; <https://doi.org/10.1016/j.ijbiomac.2019.03.234>
34. Privar, Y.; Shashura, D.; Pestov, A.; Modin, E.; Baklykov, A.; Marinin, D.; Bratskaya, S., *Metal-chelate sorbents based on carboxyalkylchitosans: Ciprofloxacin uptake by Cu(II) and Al(III)-chelated cryogels of N-(2-carboxyethyl)chitosan*, *Int. J. Biol. Macromol.*, (2019) **131**, 806-811; <https://doi.org/10.1016/j.ijbiomac.2019.03.122>
35. Viswanathan, N.; Kumar, I. A.; Meenakshi, S., *Development of chitosan encapsulated tricalcium phosphate biocomposite for fluoride retention*, *Int. J. Biol. Macromol.*, (2019) **133**, 811-816; <https://doi.org/10.1016/j.ijbiomac.2019.04.076>
36. Sathiyavimal, S.; Vasantharaj, S.; LewisOscar, F.; Pugazhendhi, A.; Subashkumar, R., *Biosynthesis and characterization of hydroxyapatite and its composite (hydroxyapatite-gelatin-chitosan-fibrin-bone ash) for bone tissue engineering applications*, *Int. J. Biol. Macromol.*, (2019) **129**, 844-852; <https://doi.org/10.1016/j.ijbiomac.2019.02.058>
37. Nawarathna, T. H. K.; Nakashima, K.; Kawasaki, S., *Chitosan enhances calcium carbonate precipitation and solidification mediated by bacteria*, *Int. J. Biol. Macromol.*, (2019) **133**, 867-874; <https://doi.org/10.1016/j.ijbiomac.2019.04.172>
38. Kim, S.-W.; Lee, T.-H.; Lee, Y.-G.; Ito, Y.; Son, T.-I., *Preparation of azidophenyl-low molecular chitosan derivative micro particles for enhance drug delivery*, *Int. J. Biol. Macromol.*, (2019) **133**, 875-880; <https://doi.org/10.1016/j.ijbiomac.2019.04.168>
39. Bharathi, D.; Ranjithkumar, R.; Vasantharaj, S.; Chandarshekhar, B.; Bhuvaneshwari, V., *Synthesis and characterization of chitosan/iron oxide nanocomposite for biomedical applications*, *Int. J. Biol. Macromol.*, (2019) **132**, 880-887; <https://doi.org/10.1016/j.ijbiomac.2019.03.233>
40. Goto, M.; Ifuku, S.; Azuma, K.; Arima, H.; Kaneko, S.; Iohara, D.; Hirayama, F.; Anraku, M., *Preparation and evaluation of freeze dried surface-deacetylated chitin nanofiber/sacran pellets for use as an extended-release excipient*, *Int. J. Biol. Macromol.*, (2019) **124**, 888-894; <https://doi.org/10.1016/j.ijbiomac.2018.11.225>

41. Izawa, H.; Kinai, M.; Ifuku, S.; Morimoto, M.; Saimoto, H., *Guanidinylated chitosan inspired by arginine-rich cell-penetrating peptides*, *Int. J. Biol. Macromol.*, (2019) **125**, 901-905; <https://doi.org/10.1016/j.ijbiomac.2018.12.138>
42. Battulga, T.; Tumurbaatar, O.; Ganzorig, O.; Ishimura, T.; Kanamoto, T.; Nakashima, H.; Miyazaki, K.; Yoshida, T., *Analysis of interaction between sulfated polysaccharides and HIV oligopeptides by surface plasmon resonance*, *Int. J. Biol. Macromol.*, (2019) **125**, 909-914; <https://doi.org/10.1016/j.ijbiomac.2018.12.010>
43. González-Espinosa, Y.; Sabagh, B.; Moldenhauer, E.; Clarke, P.; Goycoolea, F. M., *Characterisation of chitosan molecular weight distribution by multi-detection asymmetric flow-field flow fractionation (AF4) and SEC*, *Int. J. Biol. Macromol.*, (2019) **136**, 911-919; <https://doi.org/10.1016/j.ijbiomac.2019.06.122>
44. Sundaram, M. N.; Amirthalingam, S.; Mony, U.; Varma, P. K.; Jayakumar, R., *Injectable chitosan-nano bioglass composite hemostatic hydrogel for effective bleeding control*, *Int. J. Biol. Macromol.*, (2019) **129**, 936-943; <https://doi.org/10.1016/j.ijbiomac.2019.01.220>
45. Lee, M.-C.; Huang, Y.-C., *Soluble eggshell membrane protein-loaded chitosan/fucoidan nanoparticles for treatment of defective intestinal epithelial cells*, *Int. J. Biol. Macromol.*, (2019) **131**, 949-958; <https://doi.org/10.1016/j.ijbiomac.2019.03.113>
46. Lu, H.-T.; Lu, T.-W.; Chen, C.-H.; Mi, F.-L., *Development of genipin-crosslinked and fucoidan-adsorbed nano-hydroxyapatite/hydroxypropyl chitosan composite scaffolds for bone tissue engineering*, *Int. J. Biol. Macromol.*, (2019) **128**, 973-984; <https://doi.org/10.1016/j.ijbiomac.2019.02.010>
47. Fukamizo, T.; Kitaoku, Y.; Suginta, W., *Periplasmic solute-binding proteins: Structure classification and chitooligosaccharide recognition*, *Int. J. Biol. Macromol.*, (2019) **128**, 985-993; <https://doi.org/10.1016/j.ijbiomac.2019.02.064>
48. Bharathi, D.; Ranjithkumar, R.; Chandarshekhar, B.; Bhuvaneshwari, V., *Preparation of chitosan coated zinc oxide nanocomposite for enhanced antibacterial and photocatalytic activity: As a bionanocomposite*, *Int. J. Biol. Macromol.*, (2019) **129**, 989-996; <https://doi.org/10.1016/j.ijbiomac.2019.02.061>
49. Osada, M.; Kobayashi, H.; Miyazawa, T.; Suenaga, S.; Ogata, M., *Non-catalytic conversion of chitin into Chromogen I in high-temperature water*, *Int. J. Biol. Macromol.*, (2019) **136**, 994-999; <https://doi.org/10.1016/j.ijbiomac.2019.06.123>
50. Shagdarova, B.; Lunkov, A.; Il'ina, A.; Varlamov, V., *Investigation of the properties of N-[(2-hydroxy-3-trimethylammonium) propyl] chloride chitosan derivatives*, *Int. J. Biol. Macromol.*, (2019) **124**, 994-1001; <https://doi.org/10.1016/j.ijbiomac.2018.11.209>
51. Bhat, P.; Pawaskar, G.-M.; Raval, R.; Cord-Landwehr, S.; Moerschbacher, B.; Raval, K., *Expression of *Bacillus licheniformis* chitin deacetylase in *E. coli* pLysS: Sustainable production, purification and characterisation*, *Int. J. Biol. Macromol.*, (2019) **131**, 1008-1013; <https://doi.org/10.1016/j.ijbiomac.2019.03.144>
52. Nowak, K. M.; Bodek, K. H.; Szterk, A.; Rudnicka, K.; Szymborski, T.; Kosieradzki, M.; Fiedor, P., *Preclinical assessment of the potential of a 3D chitosan drug delivery system with sodium meloxicam for treating complications following tooth extraction*, *Int. J. Biol. Macromol.*, (2019) **133**, 1019-1028; <https://doi.org/10.1016/j.ijbiomac.2019.04.078>
53. Chu, F.; Wang, D.; Liu, T.; Han, H.; Yu, Y.; Yang, Q., *An optimized cocktail of chitinolytic enzymes to produce N,N'-diacetylchitobiose and N-acetyl-d-glucosamine from defatted krill by-products*, *Int. J. Biol. Macromol.*, (2019) **133**, 1029-1034; <https://doi.org/10.1016/j.ijbiomac.2019.04.114>
54. Periyasamy, S.; Manivasakan, P.; Jeyaprabha, C.; Meenakshi, S.; Viswanathan, N., *Fabrication of nano-graphene oxide assisted hydrotalcite/chitosan biocomposite: An efficient adsorbent for chromium removal from water*, *Int. J. Biol. Macromol.*, (2019) **132**, 1068-1078; <https://doi.org/10.1016/j.ijbiomac.2019.03.232>
55. Pal, P.; Pal, A., *Treatment of real wastewater: Kinetic and thermodynamic aspects of cadmium adsorption onto surfactant-modified chitosan beads*, *Int. J. Biol. Macromol.*, (2019) **131**, 1092-1100; <https://doi.org/10.1016/j.ijbiomac.2019.03.121>
56. Shibano, M.; Karakawa, M.; Kamitakahara, H.; Takano, T., *Preparation and electro-optical properties of triphenylamine-bound chitosan derivative*, *Int. J. Biol. Macromol.*, (2019) **126**, 1112-1115; <https://doi.org/10.1016/j.ijbiomac.2018.12.194>

57. Sorasitthiyanukarn, F. N.; Ratnatilaka Na Bhuket, P.; Muangnoi, C.; Rojsitthisak, P.; Rojsitthisak, P., *Chitosan/alginate nanoparticles as a promising carrier of novel curcumin diethyl diglutarate, Int. J. Biol. Macromol.*, (2019) **131**, 1125-1136; <https://doi.org/10.1016/j.ijbiomac.2019.03.120>
58. Suenaga, S.; Osada, M., *Preparation of β -chitin nanofiber aerogels by lyophilization, Int. J. Biol. Macromol.*, (2019) **126**, 1145-1149; <https://doi.org/10.1016/j.ijbiomac.2019.01.006>
59. K, R.; G, B.; Banat, F.; Show, P. L.; Cocoletzi, H. H., *Mango leaf extract incorporated chitosan antioxidant film for active food packaging, Int. J. Biol. Macromol.*, (2019) **126**, 1234-1243; <https://doi.org/10.1016/j.ijbiomac.2018.12.196>
60. Afonso, C. R.; Hirano, R. S.; Gaspar, A. L.; Chagas, E. G. L.; Carvalho, R. A.; Silva, F. V.; Leonardi, G. R.; Lopes, P. S.; Silva, C. F.; Yoshida, C. M. P., *Biodegradable antioxidant chitosan films useful as an anti-aging skin mask, Int. J. Biol. Macromol.*, (2019) **132**, 1262-1273; <https://doi.org/10.1016/j.ijbiomac.2019.04.052>
61. Kotatha, D.; Torii, Y.; Shinomiya, K.; Ogino, M.; Uchida, S.; Ishikawa, M.; Furuike, T.; Tamura, H., *Preparation of thin-film electrolyte from chitosan-containing ionic liquid for application to electric double-layer capacitors, Int. J. Biol. Macromol.*, (2019) **124**, 1274-1280; <https://doi.org/10.1016/j.ijbiomac.2018.12.006>

Special Issue: Reactive and Functional Polymers

Chitin and Chitosan for Advanced Applications – Tribute to the Memory of Prof. George A.F. Roberts & Prof. Kjell M. Vårum

Edited by Jacques Desbrieres, Eric Guibal, Bruno Sarmento, Małgorzata Jaworska, Martin G. Peter, Alexander Bismarck

Moerschbacher, B. M.; Jaworska, M.; Peter, M. G., *Obituary of George A.F. Roberts (1939–2018), React. Funct. Polym.*, (2020) **156**, 104711; <https://doi.org/10.1016/j.reactfunctpolym.2020.104711>

Draget, K. I.; Christensen, B. E., *In memory of Professor Kjell M. Vårum, React. Funct. Polym.*, (2020) **156**, 104712; <https://doi.org/10.1016/j.reactfunctpolym.2020.104712>

1. Rostamian, R.; Firouzzare, M.; Irandoust, M., *Preparation and neutralization of forcespun chitosan nanofibers from shrimp shell waste and study on its uranium adsorption in aqueous media, React. Funct. Polym.*, (2019) **143**, 104335; <https://doi.org/10.1016/j.reactfunctpolym.2019.104335>
2. Méricq, J. P.; Bouyer, D.; Włodarczyk, D.; Soussan, L.; Faur, C., *Modeling of enzymatic chitosan gelation: Tools for monitoring chitosan gelation and urea hydrolysis kinetics, React. Funct. Polym.*, (2019) **144**, 104337; <https://doi.org/10.1016/j.reactfunctpolym.2019.104337>
3. Kumar, N.; Neeraj; Ojha, A.; Singh, R., *Preparation and characterization of chitosan - pullulan blended edible films enrich with pomegranate peel extract, React. Funct. Polym.*, (2019) **144**, 104350; <https://doi.org/10.1016/j.reactfunctpolym.2019.104350>
4. Colobatiu, L.; Gavan, A.; Potarniche, A.-V.; Rus, V.; Diaconeasa, Z.; Mocan, A.; Tomuta, I.; Mirel, S.; Mihaiu, M., *Evaluation of bioactive compounds-loaded chitosan films as a novel and potential diabetic wound dressing material, React. Funct. Polym.*, (2019) **145**, 104369; <https://doi.org/10.1016/j.reactfunctpolym.2019.104369>
5. Dragan, E. S.; Dinu, M. V., *Advances in porous chitosan-based composite hydrogels: Synthesis and applications, React. Funct. Polym.*, (2020) **146**, 104372; <https://doi.org/10.1016/j.reactfunctpolym.2019.104372>
6. Le Goff, R.; Mahé, O.; Le Coz-Botrel, R.; Malo, S.; Goupil, J.-M.; Brière, J.-F.; Dez, I., *Insight in chitosan aerogels derivatives -Application in catalysis, React. Funct. Polym.*, (2020) **146**, 104393; <https://doi.org/10.1016/j.reactfunctpolym.2019.104393>
7. Feyziazar, M.; Hasanzadeh, M.; Farshchi, F.; Saadati, A.; Hassanpour, S., *An innovative method to electrochemical branching of chitosan in the presence of copper nanocubics on the surface of glassy carbon and its electrical behaviour study: A new platform for pharmaceutical analysis using electrochemical sensors, React. Funct. Polym.*, (2020) **146**, 104402; <https://doi.org/10.1016/j.reactfunctpolym.2019.104402>

8. Khalil, T. E.; Elhusseiny, A. F.; El-dissouky, A.; Ibrahim, N. M., *Functionalized chitosan nanocomposites for removal of toxic Cr (VI) from aqueous solution*, *React. Funct. Polym.*, (2020) **146**, 104407; <https://doi.org/10.1016/j.reactfunctpolym.2019.104407>
9. Perez-Puyana, V.; Rubio-Valle, J. F.; Jiménez-Rosado, M.; Guerrero, A.; Romero, A., *Chitosan as a potential alternative to collagen for the development of genipin-crosslinked scaffolds*, *React. Funct. Polym.*, (2020) **146**, 104414; <https://doi.org/10.1016/j.reactfunctpolym.2019.104414>
10. Janesch, J.; Jones, M.; Bacher, M.; Kontturi, E.; Bismarck, A.; Mautner, A., *Mushroom-derived chitosan-glucan nanopaper filters for the treatment of water*, *React. Funct. Polym.*, (2020) **146**, 104428; <https://doi.org/10.1016/j.reactfunctpolym.2019.104428>
11. Huang, G.; Qian, G.; Yan, Y.; Xu, D.; Xu, C.; Fu, L.; Lin, B., *A super long-acting and anti-photolysis pesticide release platform through self-assembled natural polymer-based polyelectrolyte*, *React. Funct. Polym.*, (2020) **146**, 104429; <https://doi.org/10.1016/j.reactfunctpolym.2019.104429>
12. Pacheco, C.; Sousa, F.; Sarmento, B., *Chitosan-based nanomedicine for brain delivery: Where are we heading?*, *React. Funct. Polym.*, (2020) **146**, 104430; <https://doi.org/10.1016/j.reactfunctpolym.2019.104430>
13. Pereira, V. d. A.; Ribeiro, I. S.; Paula, H. C. B.; de Paula, R. C. M.; Sommer, R. L.; Rodriguez, R. J. S.; Abreu, F. O. M. S., *Chitosan-based hydrogel for magnetic particle coating*, *React. Funct. Polym.*, (2020) **146**, 104431; <https://doi.org/10.1016/j.reactfunctpolym.2019.104431>
14. Luo, L.; Song, R.; Chen, J.; Zhou, B.; Mao, X.; Tang, S., *Fluorophenylboronic acid substituted chitosan for insulin loading and release*, *React. Funct. Polym.*, (2020) **146**, 104435; <https://doi.org/10.1016/j.reactfunctpolym.2019.104435>
15. Şenel, S., *Current status and future of chitosan in drug and vaccine delivery*, *React. Funct. Polym.*, (2020) **147**, 104452; <https://doi.org/10.1016/j.reactfunctpolym.2019.104452>
16. Paşcalău, V.; Bogdan, C.; Pall, E.; Matroş, L.; Pandrea, S.-L.; Suciu, M.; Borodi, G.; Iuga, C. A.; Ştiufluc, R.; Topală, T.; Pavel, C.; Popa, C.; Moldovan, M. L., *Development of BSA gel/Pectin/Chitosan polyelectrolyte complex microcapsules for Berberine delivery and evaluation of their inhibitory effect on Cutibacterium acnes*, *React. Funct. Polym.*, (2020) **147**, 104457; <https://doi.org/10.1016/j.reactfunctpolym.2019.104457>
17. Frank, L. A.; Onzi, G. R.; Morawski, A. S.; Pohlmann, A. R.; Gutierrez, S. S.; Contri, R. V., *Chitosan as a coating material for nanoparticles intended for biomedical applications*, *React. Funct. Polym.*, (2020) **147**, 104459; <https://doi.org/10.1016/j.reactfunctpolym.2019.104459>
18. George, D.; Maheswari, P. U.; Begum, K. M. M. S., *Cysteine conjugated chitosan based green nanohybrid hydrogel embedded with zinc oxide nanoparticles towards enhanced therapeutic potential of naringenin*, *React. Funct. Polym.*, (2020) **148**, 104480; <https://doi.org/10.1016/j.reactfunctpolym.2020.104480>
19. Sørlie, M.; Horn, S. J.; Vaaje-Kolstad, G.; Eijsink, V. G. H., *Using chitosan to understand chitinases and the role of processivity in the degradation of recalcitrant polysaccharides*, *React. Funct. Polym.*, (2020) **148**, 104488; <https://doi.org/10.1016/j.reactfunctpolym.2020.104488>
20. da Silva, R. C.; de Aguiar, S. B.; da Cunha, P. L. R.; de Paula, R. C. M.; Feitosa, J. P. A., *Effect of microwave on the synthesis of polyacrylamide-g-chitosan gel for azo dye removal*, *React. Funct. Polym.*, (2020) **148**, 104491; <https://doi.org/10.1016/j.reactfunctpolym.2020.104491>
21. Wu, S.; Yan, K.; Li, J.; Huynh, R. N.; Raub, C. B.; Shen, J.; Shi, X.; Payne, G. F., *Electrical cuing of chitosan's mesoscale organization*, *React. Funct. Polym.*, (2020) **148**, 104492; <https://doi.org/10.1016/j.reactfunctpolym.2020.104492>
22. Veragten, A.; Contri, R. V.; Betti, A. H.; Herzfeldt, V.; Frank, L. A.; Pohlmann, A. R.; Rates, S. M. K.; Gutierrez, S. S., *Chitosan-coated nanocapsules ameliorates the effect of olanzapine in prepulse inhibition of startle response (PPI) in rats following oral administration*, *React. Funct. Polym.*, (2020) **148**, 104493; <https://doi.org/10.1016/j.reactfunctpolym.2020.104493>
23. Yu, C.; Liu, X.; Pei, J.; Wang, Y., *Grafting of laccase-catalysed oxidation of butyl paraben and p-coumaric acid onto chitosan to improve its antioxidant and antibacterial activities*, *React. Funct. Polym.*, (2020) **149**, 104511; <https://doi.org/10.1016/j.reactfunctpolym.2020.104511>
24. Ravishankar, K.; Dhamodharan, R., *Advances in chitosan-based hydrogels: Evolution from covalently crosslinked systems to ionotropically crosslinked superabsorbents*, *React. Funct. Polym.*, (2020) **149**, 104517; <https://doi.org/10.1016/j.reactfunctpolym.2020.104517>

25. Privar, Y.; Shashura, D.; Pestov, A.; Ziatdinov, A.; Azarova, Y.; Bratskaya, S., *Effect of regioselectivity of chitosan carboxyalkylation and type of cross-linking on the metal-chelate sorption properties toward ciprofloxacin, React. Funct. Polym.*, (2020) **150**, 104536; <https://doi.org/10.1016/j.reactfunctpolym.2020.104536>
26. Cord-Landwehr, S.; Richter, C.; Wattjes, J.; Sreekumar, S.; Singh, R.; Basa, S.; El Gueddari, N. E.; Moerschbacher, B. M., *Patterns matter part 2: Chitosan oligomers with defined patterns of acetylation, React. Funct. Polym.*, (2020) **151**, 104577; <https://doi.org/10.1016/j.reactfunctpolym.2020.104577>
27. Wattjes, J.; Sreekumar, S.; Richter, C.; Cord-Landwehr, S.; Singh, R.; El Gueddari, N. E.; Moerschbacher, B. M., *Patterns matter part 1: Chitosan polymers with non-random patterns of acetylation, React. Funct. Polym.*, (2020) **151**, 104583; <https://doi.org/10.1016/j.reactfunctpolym.2020.104583>
28. Wach, R. A.; Adamus-Włodarczyk, A.; Olejnik, A. K.; Matusiak, M.; Tranquilan-Aranilla, C.; Ulanski, P., *Carboxymethylchitosan hydrogel manufactured by radiation-induced crosslinking as potential nerve regeneration guide scaffold, React. Funct. Polym.*, (2020) **152**, 104588; <https://doi.org/10.1016/j.reactfunctpolym.2020.104588>
29. Sahariah, P.; Vieira, A. P.; Guiomar, A. J.; Alves, P.; Másson, M., *Utilization of TBDMS chitosan for synthesis of photoactive chitosan derivatives and application in photografting on ophthalmic lens material, React. Funct. Polym.*, (2020) **153**, 104600; <https://doi.org/10.1016/j.reactfunctpolym.2020.104600>
30. Jaworska, M. M.; Antos, D.; Górk, A., *Review on the application of chitin and chitosan in chromatography, React. Funct. Polym.*, (2020) **152**, 104606; <https://doi.org/10.1016/j.reactfunctpolym.2020.104606>

Handbook of Chitin and Chitosan

Sreerag Gopi, Sabu Thomas and Anitha Pius (Eds.), Elsevier, 2020.

Volume 1: Preparation and Properties

506 pp., ISBN 978-0-12-817970-3; <https://doi.org/10.1016/C2018-0-03014-5>

Contents, pp. v-viii; <https://doi.org/10.1016/B978-0-12-817970-3.00018-3>

Citation of Chapter Titles:

- [1] Kumari, S.; Kishor, R., *Chapter 1 - Chitin and chitosan: origin, properties, and applications*, pp. 1-33; <https://doi.org/10.1016/B978-0-12-817970-3.00001-8>
- [2] El Knidri, H.; Laajeb, A.; Lahsini, A., *Chapter 2 - Chitin and chitosan: chemistry, solubility, fiber formation, and their potential applications*, pp. 35-57; <https://doi.org/10.1016/B978-0-12-817970-3.00002-X>
- [3] Chisty, A. H.; Masud, R. A.; Hasan, M. M.; Khan, M. N.; Mallik, A. K.; Rahman, M. M., *Chapter 3 - PEGylated chitin and chitosan derivatives*, pp. 59-100; <https://doi.org/10.1016/B978-0-12-817970-3.00003-1>
- [4] Feng, M.; Lu, X.; Hou, D.; Zhang, S., *Chapter 4 - Solubility, chain characterization, and derivatives of chitin*, pp. 101-129; <https://doi.org/10.1016/B978-0-12-817970-3.00004-3>
- [5] Akpan, E. I.; Gbenebor, O. P.; Adeosun, S. O.; Cletus, O., *Chapter 5 - Solubility, degree of acetylation, and distribution of acetyl groups in chitosan*, pp. 131-164; <https://doi.org/10.1016/B978-0-12-817970-3.00005-5>
- [6] Mallik, A. K.; Sakib, M. N.; Shaharuzzaman, M.; Haque, P.; Rahman, M. M., *Chapter 6 - Chitin nanomaterials: preparation and surface modifications*, pp. 165-194; <https://doi.org/10.1016/B978-0-12-817970-3.00006-7>
- [7] Ceylan, Z.; Meral, R.; Özogul, F.; Yilmaz, M. T., *Chapter 7 - Importance of electrospun chitosan-based nanoscale materials for seafood products safety*, pp. 195-223; <https://doi.org/10.1016/B978-0-12-817970-3.00007-9>
- [8] Hall, G. M.; Barrera, C. H.; Shirai, K., *Chapter 8 - Alternative methods for chitin and chitosan preparation, characterization, and application*, pp. 225-246; <https://doi.org/10.1016/B978-0-12-817970-3.00008-0>

- [9] Rajeswari, A.; Gopi, S.; Jackcina Stobel Christy, E.; Jayaraj, K.; Pius, A., *Chapter 9 - Current research on the blends of chitosan as new biomaterials*, pp. 247-283; <https://doi.org/10.1016/B978-0-12-817970-3.00009-2>
 - [10] Jackcina Stobel Christy, E.; Rajeswari, A.; Gopi, S.; Pius, A., *Chapter 10 - Chitin and chitosan-based aerogels*, pp. 285-334; <https://doi.org/10.1016/B978-0-12-817970-3.00010-9>
 - [11] Oyatogun, G. M.; Esan, T. A.; Akpan, E. I.; Adeosun, S. O.; Popoola, A. P. I.; Imasogie, B. I.; Soboyejo, W. O.; Afonja, A. A.; Ibitoye, S. A.; Abere, V. D.; Oyatogun, A. O.; Oluwasegun, K. M.; Akinwole, I. E.; Akinluwade, K. J., *Chapter 11 - Chitin, chitosan, marine to market*, pp. 335-376; <https://doi.org/10.1016/B978-0-12-817970-3.00011-0>
 - [12] Arshad, M.; Zubair, M.; Ullah, A., *Chapter 12 - Miscibility, properties, and biodegradability of chitin and chitosan*, pp. 377-399; <https://doi.org/10.1016/B978-0-12-817970-3.00012-2>
 - [13] Mutreja, R.; Thakur, A.; Goyal, A., *Chapter 13 - Chitin and chitosan: current status and future opportunities*, pp. 401-417; <https://doi.org/10.1016/B978-0-12-817970-3.00013-4>
 - [14] Sebastian, J.; Rouissi, T.; Brar, S. K., *Chapter 14 - Fungal chitosan: prospects and challenges*, pp. 419-452; <https://doi.org/10.1016/B978-0-12-817970-3.00014-6>
 - [15] Minh, N. C.; Van Hoa, N.; Trung, T. S., *Chapter 15 - Preparation, properties, and application of low-molecular-weight chitosan*, pp. 453-471; <https://doi.org/10.1016/B978-0-12-817970-3.00015-8>
- Index*, pp. 473-492; <https://doi.org/10.1016/B978-0-12-817970-3.00020-1>

Handbook of Chitin and Chitosan

Sreerag Gopi, Sabu Thomas and Anitha Pius (Eds.), Elsevier, 2020.

Volume 2: Composites and Nanocomposites from Chitin and Chitosan, Manufacturing and Characterisations

324 pp., ISBN 978-0-12-817968-0; <https://doi.org/10.1016/C2018-0-03015-7>

Contents, pp. v-vii; <https://doi.org/10.1016/B978-0-12-817968-0.00012-3>

Citation of Chapter Titles:

- [1] Amalraj, A.; Jude, S.; Gopi, S., *Chapter 1 - Polymer blends, composites and nanocomposites from chitin and chitosan; manufacturing, characterization and applications*, pp. 1-46; <https://doi.org/10.1016/B978-0-12-817968-0.00001-9>
- [2] Kadokawa, J.-i., *Chapter 2 - Processing techniques of chitin-based gels, blends, and composites using ionic liquids*, pp. 47-60; <https://doi.org/10.1016/B978-0-12-817968-0.00002-0>
- [3] Hasan, M. M.; Habib, M. L.; Anwaruzzaman, M.; Kamruzzaman, M.; Khan, M. N.; Rahman, M. M., *Chapter 3 - Processing techniques of chitosan-based interpenetrating polymer networks, gels, blends, composites and nanocomposites*, pp. 61-93; <https://doi.org/10.1016/B978-0-12-817968-0.00003-2>
- [4] Jayaraj, K.; Gopi, S.; Rajeswari, A.; Jackcina Stobel Christy, E.; Pius, A., *Chapter 4 - Microscopic studies on chitin and chitosan-based interpenetrating polymer networks, gels, blends, composites, and nanocomposites*, pp. 95-138; <https://doi.org/10.1016/B978-0-12-817968-0.00004-4>
- [5] Moussout, H.; Aazza, M.; Ahlafi, H., *Chapter 5 - Thermal degradation characteristics of chitin, chitosan, Al₂O₃/chitosan, and benonite/chitosan nanocomposites*, pp. 139-174; <https://doi.org/10.1016/B978-0-12-817968-0.00005-6>
- [6] Abdan, K. B.; Yong, S. C.; Chiang, E. C. W.; Talib, R. A.; Hui, T. C.; Hao, L. C., *Chapter 6 - Barrier properties, antimicrobial and antifungal activities of chitin and chitosan-based IPNs, gels, blends, composites, and nanocomposites*, pp. 175-227; <https://doi.org/10.1016/B978-0-12-817968-0.00006-8>
- [7] da Rosa Schio, R.; Mallmann, E. S.; Dotto, G. L., *Chapter 7 - Chitin and chitosan-based polyurethanes*, pp. 229-245; <https://doi.org/10.1016/B978-0-12-817968-0.00007-X>
- [8] Sahraee, S.; Milani, J. M., *Chapter 8 - Chitin and chitosan-based blends, composites, and nanocomposites for packaging applications*, pp. 247-271; <https://doi.org/10.1016/B978-0-12-817968-0.00008-1>

- [9] Costa, C. G.; Bom, L. F. R. P.; Martins, C. R.; da Silva, C. F.; de Moraes, M. A., *Chapter 9 - (Bio)composites of chitin/chitosan with natural fibers*, pp. 273-298; <https://doi.org/10.1016/B978-0-12-817968-0.00009-3>

Index, pp. 299-310; <https://doi.org/10.1016/B978-0-12-817968-0.00014-7>

Handbook of Chitin and Chitosan

Sreerag Gopi, Sabu Thomas and Anitha Pius (Eds.), Elsevier, 2020.

Volume 3: Chitin and Chitosan based Polymer Materials for Various Applications
858 pp., ISBN 978-0-12-817966-6; <https://doi.org/10.1016/C2018-0-02998-9>

Contents, pp. v-xii; <https://doi.org/10.1016/B978-0-12-817966-6.00028-5>

Citation of Chapter Titles:

- [1] Sultana, S.; Rahman, M. S.; Islam, M. M.; Sakib, M. N.; Shahruzzaman, M., *Chapter 1 - Polymer blends, IPNs, gels, composites, and nanocomposites from chitin and chitosan; manufacturing, and applications*, pp. 1-41; <https://doi.org/10.1016/B978-0-12-817966-6.00001-7>
- [2] Farinha, I.; Freitas, F., *Chapter 2 - Chemically modified chitin, chitosan, and chitinous polymers as biomaterials*, pp. 43-69; <https://doi.org/10.1016/B978-0-12-817966-6.00002-9>
- [3] Pottathara, Y. B.; Tiyyagura, H. R.; Ahmad, Z.; Thomas, S., *Chapter 3 - Chitin and chitosan composites for wearable electronics and energy storage devices*, pp. 71-88; <https://doi.org/10.1016/B978-0-12-817966-6.00003-0>
- [4] Becenen, N.; Erdoğan, S.; Fındık, E. E., *Chapter 4 - Investigation into the functional properties of cotton, wool, and denim textile materials finished with chitosan and the use of chitosan in textile-reinforced composites and medical textiles*, pp. 89-134; <https://doi.org/10.1016/B978-0-12-817966-6.00004-2>
- [5] Tovar-Jimenez, G. I.; Hirsch, D. B.; Villanueva, M. E.; Urtasun, N.; Wolman, F. J.; Copello, G. J., *Chapter 5 - Chitin blends, interpenetrating polymer networks, gels, composites, and nanocomposites for adsorption systems: environmental remediation and protein purification*, pp. 135-175; <https://doi.org/10.1016/B978-0-12-817966-6.00005-4>
- [6] Maleki, G.; Milani, J. M., *Chapter 6 - Functional properties of chitin and chitosan-based polymer materials*, pp. 177-198; <https://doi.org/10.1016/B978-0-12-817966-6.00006-6>
- [7] Hossain, M. R.; Mallik, A. K.; Rahman, M. M., *Chapter 7 - Fundamentals of chitosan for biomedical applications*, pp. 199-230; <https://doi.org/10.1016/B978-0-12-817966-6.00007-8>
- [8] Hernández-Rangel, A.; Prado-Prone, G.; Hidalgo-Moyle, J. J.; Silva-Bermudez, P.; Shirai, K., *Chapter 8 - Electrospun chitosan materials and their potential use as scaffolds for bone and cartilage tissue engineering*, pp. 231-280; <https://doi.org/10.1016/B978-0-12-817966-6.00008-X>
- [9] Xie, C.; Huang, W.; Sun, W.; Jiang, X., *Chapter 9 - Injectable polymeric gels based on chitosan and chitin for biomedical applications*, pp. 281-306; <https://doi.org/10.1016/B978-0-12-817966-6.00009-1>
- [10] Gond, L.; Pradhan, P.; Bajpai, A., *Chapter 10 - Preparation and application of biomimetic and bioinspired membranes based on chitosan*, pp. 307-339; <https://doi.org/10.1016/B978-0-12-817966-6.00010-8>
- [11] Oyatogun, G. M.; Esan, T. A.; Akpan, E. I.; Adeosun, S. O.; Popoola, A. P. I.; Imasogie, B. I.; Soboyejo, W. O.; Afonja, A. A.; Ibitoye, S. A.; Abere, V. D.; Oyatogun, A. O.; Oluwasegun, K. M.; Akinwole, I. E.; Akinluwade, K. J., *Chapter 11 - Chitin, chitosan, marine to market*, pp. 341-381; <https://doi.org/10.1016/B978-0-12-817966-6.00011-X>
- [12] Milani, J., *Chapter 12 - Chitin- and chitosan-based oleogels: rheological and thermal behavior modifications*, pp. 383-406; <https://doi.org/10.1016/B978-0-12-817966-6.00012-1>
- [13] Lopes, P. P.; Tanabe, E. H.; Bertuol, D. A., *Chapter 13 - Chitosan as biomaterial in drug delivery and tissue engineering*, pp. 407-431; <https://doi.org/10.1016/B978-0-12-817966-6.00013-3>
- [14] Biswas, S.; Ahmed, T.; Islam, M. M.; Islam, M. S.; Rahman, M. M., *Chapter 14 - Biomedical applications carboxymethyl chitosans*, pp. 433-470; <https://doi.org/10.1016/B978-0-12-817966-6.00014-5>

- [15] Silva, S. S.; Gomes, J. M.; Rodrigues, L. C.; Reis, R. L., *Chapter 15 - Biomedical exploitation of chitin and chitosan-based matrices via ionic liquid processing*, pp. 471-497; <https://doi.org/10.1016/B978-0-12-817966-6.00015-7>
- [16] Akpan, E. I.; Gbenebor, O. P.; Adeosun, S. O.; Cletus, O., *Chapter 16 - Chitin and chitosan composites for bone tissue regeneration*, pp. 499-553; <https://doi.org/10.1016/B978-0-12-817966-6.00016-9>
- [17] Panonnummal, R.; Antony, N.; Sabitha, M., *Chapter 17 - Drug delivery and tissue engineering applications of chitosan-based biomaterial systems*, pp. 555-588; <https://doi.org/10.1016/B978-0-12-817966-6.00017-0>
- [18] Anraku, M.; Ifuku, S.; Iohara, D.; Hirayama, F.; Otagiri, M.; Gebicki, J. M., *Chapter 18 - Future aspects of biomedical applications of chitin and chitosan in diseases associated with oxidative stress*, pp. 589-608; <https://doi.org/10.1016/B978-0-12-817966-6.00018-2>
- [19] Hoseini, M. H. M.; Sadeghi, S.; Azizi, M.; Pouriran, R., *Chapter 19 - Immunomodulatory activities of chitin and chitosan microparticles*, pp. 609-639; <https://doi.org/10.1016/B978-0-12-817966-6.00019-4>
- [20] Zubair, M.; Arshad, M.; Pradhan, R. A.; Ullah, A., *Chapter 20 - Chitosan/chitin-based composites for food packaging applications*, pp. 641-670; <https://doi.org/10.1016/B978-0-12-817966-6.00020-0>
- [21] Ciro, Y.; Rojas, J.; Yarce, C. J.; Salamanca, C. H., *Chapter 21 - Modified release properties of glutathione-based chitosan films: Physical and functional characterization*, pp. 671-688; <https://doi.org/10.1016/B978-0-12-817966-6.00021-2>
- [22] Fernández-Marín, R.; Fernandes, S. C. M.; McReynolds, C.; Labidi, J.; Sánchez, M. Á. A., *Chapter 22 - Chitosan-based materials as templates for essential oils*, pp. 689-720; <https://doi.org/10.1016/B978-0-12-817966-6.00022-4>
- [23] Islam, M. S.; Rahman, M. S.; Ahmed, T.; Biswas, S.; Haque, P.; Rahman, M. M., *Chapter 23 - Chitosan and chitosan-based biomaterials for wound management*, pp. 721-759; <https://doi.org/10.1016/B978-0-12-817966-6.00023-6>
- [24] Kamilya, D.; Khan, M. I. R., *Chapter 24 - Chitin and chitosan as promising immunostimulant for aquaculture*, pp. 761-771; <https://doi.org/10.1016/B978-0-12-817966-6.00024-8>
- [25] Zubair, M.; Arshad, M.; Ullah, A., *Chapter 25 - Chitosan-based materials for water and wastewater treatment*, pp. 773-809; <https://doi.org/10.1016/B978-0-12-817966-6.00025-X>

Index, pp. 811-839; <https://doi.org/10.1016/B978-0-12-817966-6.00030-3>