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Hydrogel-nanoparticle hybrids for biomedical applications: Principles and advantages (Review)

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- 1 Bhatia, S.
Nanoparticles types, classification, characterization, fabrication methods and drug delivery applications
(2016) *Natural Polymer Drug Delivery Systems*, pp. 33-93. Cited 153 times.
Springer International Publishing, Cham, Switzerland
-
- 2 Calixto, G., Bernegossi, J., Fonseca-Santos, B., Chorilli, M.
Nanotechnology-based drug delivery systems for treatment of oral cancer: A review
(Open Access)

(2014) *International Journal of Nanomedicine*, 9 (1), pp. 3719-3735. Cited 85 times.
<http://www.dovepress.com/getfile.php?fileID=21123>
doi: 10.2147/IJN.S61670

View at Publisher
-
- 3 Chai, Q., Jiao, Y., Yu, X.
Hydrogels for biomedical applications: Their characteristics and the mechanisms behind them
(2017) *Gels*, 3 (1), p. 6. Cited 207 times.
-
- 4 Muniz, B.V., Baratelli, D., Di Carla, S., Serpe, L., da Silva, C.B., Guilherme, V.A., Ribeiro, L.N.M., (...), Franz-Montan, M.
Hybrid Hydrogel Composed of Polymeric Nanocapsules Co-Loading Lidocaine and Prilocaine for Topical Intraoral Anesthesia (Open Access)

(2018) *Scientific Reports*, 8 (1), art. no. 17972. Cited 13 times.
www.nature.com/srep/index.html
doi: 10.1038/s41598-018-36382-4

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-
- 5 Palmese, L.L., Thapa, R.K., Sullivan, M.O., Kiick, K.L.
Hybrid hydrogels for biomedical applications (Open Access)

(2019) *Current Opinion in Chemical Engineering*, 24, pp. 143-157. Cited 33 times.
http://www.elsevier.com.ezlib.iium.edu.my/wps/find/journaldescription.cws_home/725837/description#description
doi: 10.1016/j.coche.2019.02.010

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-
- 6 Narayanaswamy, R., Torchilin, V.P.
Hydrogels and their applications in targeted drug delivery (Open Access)

(2019) *Molecules*, 24 (3), art. no. 603. Cited 109 times.
<https://www.mdpi.com/1420-3049/24/3/603/pdf>
doi: 10.3390/molecules24030603

View at Publisher
-
- 7 Holback, H., Yeo, Y., Park, K.
Hydrogel swelling behavior and its biomedical applications

(2011) *Biomedical Hydrogels: Biochemistry, Manufacture and Medical Applications*, pp. 3-24. Cited 23 times.
<http://dx.doi.org.ezlib.iium.edu.my/10.1016/B978-1-84569-590-3.50001-1>
ISBN: 978-184569590-3
doi: 10.1016/B978-1-84569-590-3.50001-1

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-

- 8 Khaled, S.Z., Cevenini, A., Yazdi, I.K., Parodi, A., Evangelopoulos, M., Corbo, C., Scaria, S., (...), Tasciotti, E.
One-pot synthesis of pH-responsive hybrid nanogel particles for the intracellular delivery of small interfering RNA ([Open Access](#))
(2016) *Biomaterials*, 87, pp. 57-68. Cited 36 times.
<http://www.journals.elsevier.com/biomaterials/>
doi: 10.1016/j.biomaterials.2016.01.052
[View at Publisher](#)
-
- 9 Wang, K., Hao, Y., Wang, Y., Chen, J., Mao, L., Deng, Y., Chen, J., (...), Liao, W.
Functional Hydrogels and Their Application in Drug Delivery, Biosensors, and Tissue Engineering ([Open Access](#))
(2019) *International Journal of Polymer Science*, 2019, art. no. 3160732. Cited 11 times.
<http://www.hindawi.com/journals/ijps/>
doi: 10.1155/2019/3160732
[View at Publisher](#)
-
- 10 Pourjavadi, A., Amin, S.S., Hosseini, S.H.
Delivery of Hydrophobic Anticancer Drugs by Hydrophobically Modified Alginate Based Magnetic Nanocarrier
(2018) *Industrial and Engineering Chemistry Research*, 57 (3), pp. 822-832. Cited 18 times.
<http://pubs.acs.org.ezlib.iium.edu.my/journal/iecred>
doi: 10.1021/acs.iecr.7b04050
[View at Publisher](#)
-
- 11 Haraguchi, K., Takehisa, T.
Nanocomposite hydrogels: A unique organic-inorganic network structure with extraordinary mechanical, optical, and swelling/De-swelling properties
(2002) *Advanced Materials*, 14 (16), pp. 1120-1124. Cited 1605 times.
doi: 10.1002/1521-4095(20020816)14:16<1120::AID-ADMA1120>3.0.CO;2-9
[View at Publisher](#)
-
- 12 Biondi, M., Borzacchiello, A., Mayol, L., Ambrosio, L.
Nanoparticle-integrated hydrogels as multifunctional composite materials for biomedical applications
(2015) *Gels*, 1 (2), pp. 162-178. Cited 50 times.
-
- 13 Dannert, C., Stokke, B.T., Dias, R.S.
Nanoparticle-hydrogel composites: From molecular interactions to macroscopic behavior ([Open Access](#))
(2019) *Polymers*, 11 (2), art. no. 275. Cited 37 times.
<https://www.mdpi.com/2073-4360/11/2/275/pdf>
doi: 10.3390/polym11020275
[View at Publisher](#)
-
- 14 Kim, H., Jo, A., Baek, S., Lim, D., Park, S.-Y., Cho, S.K., Chung, J.W., (...), Yoon, J.
Synergistically enhanced selective intracellular uptake of anticancer drug carrier comprising folic acid-conjugated hydrogels containing magnetite nanoparticles ([Open Access](#))
(2017) *Scientific Reports*, 7, art. no. 41090. Cited 35 times.
www.nature.com/srep/index.html
doi: 10.1038/srep41090
[View at Publisher](#)

- 15 Grillo, R., Dias, F.V., Querobino, S.M., Alberto-Silva, C., Fraceto, L.F., de Paula, E., de Araujo, D.R.
Influence of hybrid polymeric nanoparticle/thermosensitive hydrogels systems on formulation tracking and in vitro artificial membrane permeation: A promising system for skin drug-delivery
(2019) *Colloids and Surfaces B: Biointerfaces*, 174, pp. 56-62. Cited 21 times.
www.elsevier.com/locate/colsurfb
doi: 10.1016/j.colsurfb.2018.10.063
View at Publisher
-
- 16 Thoniyot, P., Tan, M.J., Karim, A.A., Young, D.J., Loh, X.J.
Nanoparticle–Hydrogel Composites: Concept, Design, and Applications of These Promising, Multi-Functional Materials ([Open Access](#))
(2015) *Advanced Science*, 2 (1-2), art. no. 1400010. Cited 377 times.
[http://onlinelibrary.wiley.com.ezlib.iium.edu.my/journal/10.1002/\(ISSN\)2198-3844](http://onlinelibrary.wiley.com.ezlib.iium.edu.my/journal/10.1002/(ISSN)2198-3844)
doi: 10.1002/adv.201400010
View at Publisher
-
- 17 Pardo-Yissar, V., Gabai, R., Shipway, A.N., Bourenko, T., Willner, I.
Gold nanoparticle/hydrogel composites with solvent-switchable electronic properties
(2001) *Advanced Materials*, 13 (17), pp. 1320-1323. Cited 156 times.
doi: 10.1002/1521-4095(200109)13:17<1320::AID-ADMA1320>3.0.CO;2-8
View at Publisher
-
- 18 Haraguchi, K.
Nanocomposite hydrogels
(2007) *Current Opinion in Solid State and Materials Science*, 11 (3-4), pp. 47-54. Cited 321 times.
doi: 10.1016/j.cossms.2008.05.001
View at Publisher
-
- 19 Wang, C., Flynn, N.T., Langer, R.
Controlled structure and properties of thermoresponsive nanoparticle-hydrogel composites
(2004) *Advanced Materials*, 16 (13), pp. 1074-1079. Cited 242 times.
doi: 10.1002/adma.200306516
View at Publisher
-
- 20 Wu, H., Yu, G., Pan, L., Liu, N., McDowell, M.T., Bao, Z., Cui, Y.
Stable Li-ion battery anodes by in-situ polymerization of conducting hydrogel to conformally coat silicon nanoparticles ([Open Access](#))
(2013) *Nature Communications*, 4, art. no. 1943. Cited 883 times.
<http://www.nature.com/ncomms/index.html>
doi: 10.1038/ncomms2941
View at Publisher
-
- 21 Marchiori, M.L., Lubini, G., Dalla Nora, G., Friedrich, R.B., Fontana, M.C., Ourique, A.F., Bastos, M.O., (...), Beck, R.C.R.
Hydrogel containing dexamethasone-loaded nanocapsules for cutaneous administration: Preparation, characterization, and in vitro drug release study
(2010) *Drug Development and Industrial Pharmacy*, 36 (8), pp. 962-971. Cited 54 times.
<http://informahealthcare.com/loi/ddi>
doi: 10.3109/03639041003598960
View at Publisher
-

- 22 Contri, R.V., Katzer, T., Pohlmann, A.R., Guterres, S.S.
Chitosan hydrogel containing capsaicinoids-loaded nanocapsules: An innovative formulation for topical delivery

(2010) *Soft Materials*, 8 (4), pp. 370-385. Cited 31 times.
doi: 10.1080/1539445X.2010.525161

[View at Publisher](#)

- 23 Basso, J., Miranda, A., Nunes, S.
Hydrogel-based drug delivery nanosystems for the treatment of brain tumors
(2018) *Gels*, 4 (3), p. 62. Cited 29 times.

- 24 Bastiancich, C., Vanvarenberg, K., Ucakar, B., Pitorre, M., Bastiat, G., Lagarce, F., Preát, V., (...), Danhier, F.
Lauroyl-gemcitabine-loaded lipid nanocapsule hydrogel for the treatment of glioblastoma

(2016) *Journal of Controlled Release*, 225, pp. 283-293. Cited 64 times.
www.elsevier.com/locate/jconrel
doi: 10.1016/j.jconrel.2016.01.054

[View at Publisher](#)

- 25 Saeednia, L., Yao, L., Cluff, K., Asmatulu, R.
Sustained Releasing of Methotrexate from Injectable and Thermosensitive Chitosan-Carbon Nanotube Hybrid Hydrogels Effectively Controls Tumor Cell Growth
([Open Access](#))

(2019) *ACS Omega*, 4 (2), pp. 4040-4048. Cited 20 times.
pubs.acs.org/journal/acsodf
doi: 10.1021/acsomega.8b03212

[View at Publisher](#)

- 26 Alonci, G., Fiorini, F., Riva, P., Monroy, F., López-Montero, I., Perretta, S., De Cola, L.
Injectable Hybrid Hydrogels, with Cell-Responsive Degradation, for Tumor Resection
([Open Access](#))

(2018) *ACS Applied Bio Materials*, 1 (5), pp. 1301-1310. Cited 9 times.
pubs.acs.org/journal/aabmcb
doi: 10.1021/acsabm.8b00189

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