H. Rocha-Ledo. "Microcapsules of alginate/chitosan containing magnetic nanoparticles for controlled release of insulin". Colloids and Surfaces B: Biointerfaces, vol. 81, pp. 206-211, 2010.

[0230] 23. S. Hu, C. Tsai, C. Liao, D. Liu, S. Chen. "Controlled Rupture of Magnetic Polyelectrolyte Microcapsules for Drug Delivery". Langmuir, vol. 24, pp. 1181-11818, 2008.

[0231] 24. B. Koppolu, M. Rahimi, S. Nattama, A. Wadajkar, K. T. Nguyen. "Development of multiple-layer polymeric particles for targeted and controlled drug delivery". Nanomedicine, vol. 6, pp. 355-361, 2010.

[0232] 25. K. Katagiri, Y. Imai, K. Koumoto. "Variable on-demand release function of magnetoresponsive hybrid capsules". Journal of Colloid and Interface Science, vol. 361, pp. 109-114, 2011.

[0233] 26. A. Bernkop-Schnürch, S. Dünnhaupt. "Chitosan-based drug delivery systems". European Journal of Pharmaceutics and Biopharmaceutics, vol. 81, pp. 463-469, 2012.

[0234] 27. T. Jiang, R. James, S. G. Kumbar. C. T. Laurencin, Natural and Synthetic Biomedical Polymers, ch. 5, Elsevier, 2014, 2014.

[0235] 28. Y. Luo, Q. Wang. "Recent developments of chitosan-based polyelectrolyte complexes with natural polysachharides for drug delivery". International Journal of Biological Macromolecules, vol. 64, pp. 353-367, 2014.

[0236] 29. M. P. Patel, R. R. Patel, J. K. Patel. "Chitosan Mediated Targeted Drug Delivery System: A Review". Journal of Pharmaceutical Sciences, vol. 13, pp. 536-557, 2010.

[0237] 30. R. M. Patil, P. B. Shete, N. D. Thorat, S. V. Otari, K. C. Barick, A. Prasad, R. S. Ningthoujam, B. M. Tiwale, S. H. Pawar. "Superparamagnetic iron oxide/chitosan core/shells for hyperthermia application: Improved colloidal stability and biocompatibility". Journal of Magnetism and Magnetic Materials, vol. 355, pp. 22-30, 2014.

[0238] 31. D. Zhao, X. Wang, X, Zeng, Q. Xia, J. Tang. "Preparation and inductive heating property of Fe3O4-chitosan composite nanoparticles in an AC magnetic field for localized hyperthermia". Journal of Alloys and Compounds, vol. 477, pp. 739-743, 2009.

[0239] 32. H. O. Park, K. Im, S. Lee, D. Kim, D. Lee, Y. Lee, K. Kim, K. Kim. "Preparation and characterization of magnetic chitosan particles for hyperthermia application". Journal of Magnetism and Magnetic Materials, vol. 293, pp. 328-333, 2005.

[0240] 33. C. Sanjai, S. Kothan, P. Gonil, S. Saesoo, W. Sajomsang. "Chitosan-triphosphate nanoparticles for encapsulation of super-paramagnetic iron oxide as an MRI contrast agent". Carbohydrate Polymers, vol. 104, pp. 231-237, 2014.

[0241] 34. Z. Tsai, J. Wang, H. Kuo, C. Shen, J. Wang, T. Yen. "In situ preparation of high relaxivity iron oxide nanoparticles by coating with chitosan: A potential MRI contrast agent useful for cell tracking". Journal of Magnetism and Magnetic Materials, vol. 322, pp. 208-213, 2010.

[0242] 35. Y. Huang, B. Cao, X. Yang, Q. Zhang, X. Han, Z. Guo. "Gd complexes of diethylenetriaminepentaacetic acid conjugates of low-molecular-weight chitosan oligosaccharide as a new liver-specific MRI contrast agent". Magnetic Resonance Imaging, vol. 31, pp. 604-609, 2013.

[0243] 36. T. Ahmad, H Bae, Y. Iqbal, I. Rhee, S. Hong, Y. Chang, J. Lee, D. Sohn. "Chitosan-coated nickel-ferrite nanoparticles as contrast agents in magnetic resonance imaging". Journal of Magnetism and Magnetic Materials, vol. 381, pp. 151-157, 2015.

[0244] 37. M. Schafer, T. R. Schneider, G. M. Scheldrick. (December, 1996). Crystal structure of vancomycin. Structure, 4(12), pp. 1509-1515.

[0245] 38. M. E. Roy, M. P. Peppers, L. A. Whiteside, R. M. LaZear. (March, 2014). Vancomycin concentration in synovial fluid: direct infection into the knee vs intravenous infusion. The Journal of Arthroplasty, 29(3), pp. 564-568.

[0246] 39. V. P. Mantripragada, A. C. Jayasuriya. (October, 2016). Effect of dual delivery of antibiotics (vancomycin and cefazolin) and BMP-7 from chitosan microparticles on *Staphylococcus epidermis* and pre-osteoblasts in vitro. Materials Science and Engineering C, 67, pp. 409-417.

[0247] 40. T. Cerchiara et al. (June, 2016). Microparticles based on chitosan/carboxymethylcellulose polyelectrolyte complexes for colon delivery of vancomycin. Carbohydrate polymers. 143, pp. 124-130.

[0248] 41. Z. Yang, J. Liu, J. Gao, S. Chen, G. Huang. (November, 2015). Chitosan coated vancomycin hydrochloride liposomes: characterizations and evaluation. International Journal of Pharmaceutics. 495, pp. 508-515.

[0249] 42. Y. S. Kang, S. Risbud, J. F. Rabolt, P. Stroeve. (1996). Synthesis and Characterization of Nanometer-Size Fe3O4 and γ-Fe2O3. Chem. Mater. 8, pp. 2209-2211.

[0250] 43. H. Li, L. Qin, Y. Feng, L. Hu, C. Zhou. (January, 2015). Preparation and characterization of highly water-soluble magnetic Fe3O4 nanoparticles via surface double-layered self-assembly method of sodium alpha-olefin sulfonate. Journal of Magnetism and Magnetic Materials. 384(15), pp. 213-218.

[0251] 44. H. Lv, R. Jiang, Y. Li, X. Zhang, J. Wang. (March, 2015). Microemulsion-mediated hydrothermal growth of pagoda-like Fe3O4 microstructures and their application in a lithium-air battery. Ceramics International. 41(7), pp. 8843-8848.

[0252] Y45. S. Kang, S. Risbud, J. F. Rabolt, P. Stroeve. (1996). Synthesis and Characterization of Nanometer-Size Fe3O4 and γ-Fe2O3. Chem. Mater. 8, pp. 2209-2211

What is claimed is:

1. A microbead comprising cross-linked chitosan, a magnetic nanoparticle, and an agent.

2. The microbead of claim **1**, wherein the chitosan is cross-linked to a polymer.

3. The microbead of claim **3**, wherein the polymer is polyethylene dimethacrylate (PEGDMA).

4. The microbead of claim **1**, wherein the microbead comprises an effective amount of an agent selected from the group consisting of a polypeptide, polynucleotide or small compound.

5. The microbead of claim **1**, wherein the agent is an analgesic, angiogenic agent, antimicrobial, antibody, antifungal, anti-inflammatory, anti-thrombotic, chemotherapeutic, growth factor, hormone, or steroid agent.

6. The microbead of claim **1**, wherein the effective amount of the agent is sufficient to reduce the survival or proliferation of a fungal or bacterial cell.