

However, one should keep in mind that there are many potential issues associated with other solubilizing technologies that may not be so obvious in the early development stages, such as patient compliance issues with an injectable formulation that causes severe pain. Therefore, it is important in the early preformulation studies to carefully consider all the factors (pros and cons) before making a final commitment to complex technology.

## SUMMARY

The use of complexation in overcoming pharmaceutical solubility problems has clear advantages over other means of solubilization. The advances in the area of CD research and commercialization will lead to lower costs and bulk production methods, making the technique even more attractive. The commercial viability of complex-containing drug formulations has been established with the marketing of many products. The high development cost associated with potential regulatory hurdles, loyalty payment and the cost-of-goods of complexing agents still remain as the major limitations for the wide utilization of this technique.

## REFERENCES

- Abdul Rasool, B. K. and H. M. Salmo. 2012. Development and clinical evaluation of clotrimazole- $\beta$ -cyclodextrin eyedrops for the treatment of fungal keratitis. *AAPS PharmSciTech* 13(3): 883–889.
- Ammar, H. O., H. A. Salama, M. Ghorab and A. A. Mahmoud. 2006. Implication of inclusion complexation of glimepiride in cyclodextrin-polymer systems on its dissolution, stability and therapeutic efficacy. *Int. J. Pharm.* 320(1–2): 53–57.
- Bary, A. R., I. G. Tucker and N. M. Davies. 2001. An insight into how cyclodextrins increase the ocular bioavailability of poorly water-soluble compounds. *Proceedings–28th International Symposium on Controlled Release of Bioactive Materials and 4th Consumer & Diversified Products Conference*, San Diego, CA, June 23–27, 2001.
- Basavaraj, S., V. Sihorkar, T. R. S. Kumar, P. Sundaramurthi, N. R. Srinivas, P. Venkatesh, M. Ramesh and S. K. Singh. 2006. Bioavailability enhancement of poorly water soluble and weakly acidic new chemical entity with 2-hydroxy propyl- $\beta$ -cyclodextrin: Selection of meglumine, a polyhydroxy base, as a novel ternary component. *Pharm. Dev. Tech.* 11(4): 443–451.
- Baszkin, A., A. Angelova and C. Ringard-Lefebvre. 1999. Host-guest complexation of water soluble and water insoluble drugs by cyclodextrins. *Book of Abstracts, 218th ACS National Meeting*, New Orleans, LA, August 22–26. COLL-011.
- Bender, M. L. and M. Komiyama. 1978. *Cyclodextrin Chemistry*, Berlin, Germany: Springer-Verlag.
- Boje, K. M., M. Sak and H. L. Fung. 1988. Complexation of nifedipine with substituted phenolic ligands, *Pharm. Res.* 5(10): 655–659.
- Caira, M. R. and D. R. Dodds. 1999. Inclusion of nonopirate analgesic drugs in cyclodextrins. I. X-ray structure of a 1:1 beta-cyclodextrin-p-bromoacetanilide complex. *J. Incl. Phenom. Macrocycl. Chem.* 34: 19–29.
- Casu, B., M. Reggiani, G. G. Gallo and A. Vigevaldi. 1970. *Carbohydr. Res.* 12: 157–170.
- Celebi, N. and T. Nagai. 1988. Improvement of dissolution characteristics of piromidic acid by dimethyl- $\beta$ -cyclodextrin complexation. *Drug Dev. Ind. Pharm.* 14: 63–75.
- Chen, A. X., S. W. Zito and R. A. Nash. 1994. Solubility enhancement of nucleosides and structurally related compounds by complex formation. *Pharm. Res.* 11(3): 398–401.
- Chordiya, M. A. and K. Senthilkumaran. 2012. Cyclodextrin in drug delivery: A review. *Res. Rev. J. Pharm. Pharm. Sci.* 1(1): 19–29.
- Clarke, R. J., J. H. Coates and S. F. Lincoln. 1988. Inclusion complexes of the cyclomalto-oligosaccharides. In *Advances in Carbohydrate Chemistry and Biochemistry*, R. S. Tipson and D. Horton (Eds.), San Diego, CA: Academic Press.
- Cohen, J. and J. L. Lach. 1963. Interaction of pharmaceuticals with Schardinger Dextrins I interaction with hydroxybenzoic acids and p-hydroxybenzoates. *J. Pharm. Sci.* 52: 132–136.
- Connors, K. A. 1987. *Binding Constants—The Measurement of Molecular Complex Stability*. New York: John Wiley & Sons.