the individual Ru^{II} arene and curcumin components contribute to the *in vitro* behavior of the compounds, and potentially how this synergy contributes to their very good observed activity.

15.8 Conclusion

The well-established coordination chemistry of ruthenium provides an array of potential routes for the coordination of biological species with useful pharmacological properties. As described above, this has allowed a wide variety of compounds with biologically-derived ligands to be synthesized and tested for anticancer activity. While some of these compounds involve relatively simple use of such ligands, such as in the case of chelating amino acids, recent reports have shown that much more sophisticated approaches are beginning to be developed. The use of receptor-targeting peptides and antisense oligonucleotides are examples of modern approaches that herald a new direction in the development of ruthenium chemotherapeutics. While a great number of studies have focused on the derivatization of well-established ruthenium anticancer compounds, these developments have been hampered by a lack of knowledge regarding the origin of their activity. Addition of biological ligands allows for rational design of new complexes based on the known *in vivo* behavior and molecular biology of the biological species. This research area is still relatively undeveloped, but the variety of ruthenium complexes and biologically-derived ligands of interest provide an almost limitless potential for new complexes with novel modes of targeting and activity.

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