SUMMARY AND CONCLUSION

The thesis entitled "Synthesis of chiral compounds using enzyme mediated organic reactions" describes the investigations carried out using lipase catalyzed kinetic resolution as a strategy for the enantioselective synthesis of some chiral intermediates.

In Chapter 1 of the thesis a brief review of the reactions catalyzed by Candida rugosa lipase (CRL) is presented. The reactions are classified based on the type of selectivity exhibited by the enzyme and this review shows the versatility and usefulness of this lipase for synthetic transformations.

Chapter 2 of the thesis describes the use of the lipase Candida cylindracea as a catalyst for the resolution of racemic aldol products. In this chapter the effect of structure of the substrate on enantioselectivity, effect of temperature on enantioselectivity, etc. are described. Here, both enzymatic techniques viz., transesterification and hydrolysis have been used as a means for the resolution process. The absolute stereochemistry of the products has also been established based on literature precedence.

A part of this work has been published in the journal Tetrahedron Asymmetry and presented as a poster in a National symposium.

Lipase catalyzed kinetic resolution of aryl β-hydroxy ketones

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Chapter 3 of the thesis describes the lipase catalyzed resolution of two very important structural units namely, 4-hydroxytetralone and 3-hydroxyindanone. The occurrence of these chiral structural units in biologically active compounds and natural products is brought out in the introduction to this chapter. Kinetic resolution studies have been carried out for the synthesis of these compounds in optically pure form. Here
also both enzymatic techniques have been used, transesterification and hydrolysis, to carry out the resolution. The absolute stereochemistry of the products has been established.

This work has been published in *Tetrahedron Asymmetry*.

**Efficient enzymatic kinetic resolution of 4-hydroxytetralone and 3-hydroxyindanone**


The last chapter of the thesis describes the application of the lipase catalyzed transesterification method as the key step for the synthesis of the marine natural products, albicanol and albicanyl acetate which possess fish antifeedant activity. Starting from β-ionone, (±)-albicanol has been synthesized in six steps and the latter was resolved using *Candida cylindracea* lipase.

This work has been published in *Tetrahedron*

**Synthesis of (+)-albicanol, (+)-albicanyl acetate and chiral intermediates useful in the synthesis of drimanes and labdanes.**


In conclusion, it has been proved that commercially readily available, stable enzymes such as CCL can be used for the successful synthesis of chiral synthons like aldol products, 4-hydroxytetralone, 3-hydroxyindanone, albicanol and albicanyl acetate based on lipase catalyzed kinetic resolution strategy. It is anticipated that these chiral intermediates will prove useful for the stereoselective synthesis of various pharmaceutically interesting compounds.