

## Silymarin Based Complexes - a mini Review

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**Abstract.** *Silymarin (SIL) is a component extracted from Silybum marianum herb and is studied in medicine due to its protective activities on certain organs (liver, kidney, heart, brain). The review discusses some methods that increase silymarin bioavailability such as development of complexes with cyclodextrins, phospholipids, liposome and nanostructured material (hydroxyapatite-HAP). The interactions between SIL and alpha-lipoic acid, metallic nanoparticles (gold nanoparticles-GNP, and silver nanoparticles – SNP), some carotenoids (β-carotene and lycopene) and curcumin were debated too. Some combined treatments (e.g. SIL + curcumin) highlighted anticancer activity against colon cancer cells (DLD-1, HCT116 and LoVo) and protective effect against chemicals toxicity.*

**Key words:** Silymarin, complexes, hydroxyapatite, phospholipids, metallic nanoparticles, carotenoid

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### 1. Introduction

Silymarin (SIL) is a component extracted from Silybum marianum herb also known under the Milk thistle, Lady's Thistle, Mariana lactea Hill, Marian Thistle, St Mary's Thistle name. The content of silymarin in the plants hydro-alcoholic extract is 70-80% and consists in a mixture of flavonolignans, flavonoid, lipids and sterols. The principal flavonolignans of silymarin are silibin, isosilibin (A and B), silydianin, and silychristin [1, 2]. The plant has been used since ancient times, 2000 years, in medicine to treat kidney, spleen, liver and gall bladder diseases. Also the nursing mothers use the plant for stimulating milk production, as a bitter tonic, for haemorrhoids and dyspeptic complaints [3].

Silymarin is currently a compound studied in medicine due to its protective activities on certain organs. Figure 1 shows a scheme showing how silymarin can treat certain organs affected by disease through antioxidant, anti-inflammatory, anti-fibrotic, anti-cancer and anti-toxin mechanisms.