BACKGROUND

Curcuma Longa commonly referred to as turmeric is used in South Asian cooking, as a cosmetic agent and in ancient Ayurveda. Curcumin is a natural product of turmeric that has been found to have anti-cancer and anti-inflammatory properties. Some analogs of curcumin are mentioned in the literature but their efficacy has not been determined. Being an oil soluble compound its effectiveness (in vivo) in plasma (low solubility) and in cell environment gets limited. The curcumin analogs reported in past have both the phenolic groups chemically modified. Also, Curcumin monomers or polymer in which only one of the phenolic groups has been modified are difficult to synthesize.

INVENTION

The primary objective of this invention is to synthesize novel curcumin (CC) and tetrahydrocurcumin (THC) derivatives which have been modified at one phenolic group to incorporate more-reactive groups and have improved hydrophilic properties. The CC and THC derivatives are in the form of monomers, dimmers, polymers and antibody-drug (curcumin) conjugates. These entities are more effective parent molecules with cancer cell killing properties and are also water soluble with improved therapeutic and formulation properties.

APPLICATIONS

The modified CC or THC derivatives can be used:
- For treatment for various diseases like amyloid protein related diseases, cancer related diseases, multiples sclerosis, multiple myeloma, cystic fibrosis, prion diseases and other autoimmune diseases.
- As Anti-oxidants
- As Dyes for imaging
- As Food additive
- For cosmetic and anti-aging applications to reduce inflammation,
- As skin lightening formulation and
- Against melanoma.

ADVANTAGES

- This technology produces CC or THC with improved properties than unmodified forms.
- The compounds have increased efficacy in aqueous media including plasma.
- The compounds have amplified biological effectiveness and improved apoptosis rate.

MARKET

- More than 11 million people are diagnosed with cancer every year, and the cancer therapy market is the second largest pharmaceutical market in terms of revenue. The global market for cancer therapies will be worth $110.6 billion in 2013.
- Also, global autoimmune disease therapeutics market to exceed US$77 Billion by 2017.

TEAM

Dr. Krishnaswami Raja, Associate Professor, College of Staten Island, CUNY
Dr. Probal Banerjee, Professor, College of Staten Island, CUNY
Dr. Andrew Auerbach, CUNY; Dr. Wei Shi, CUNY ; Dr. William L'Amoreaux, CUNY; Joe Lau, CUNY; Dr. Abdeslem El Idrissi, CUNY.