Smart Materials

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Theme: Develop New Path of Smartness

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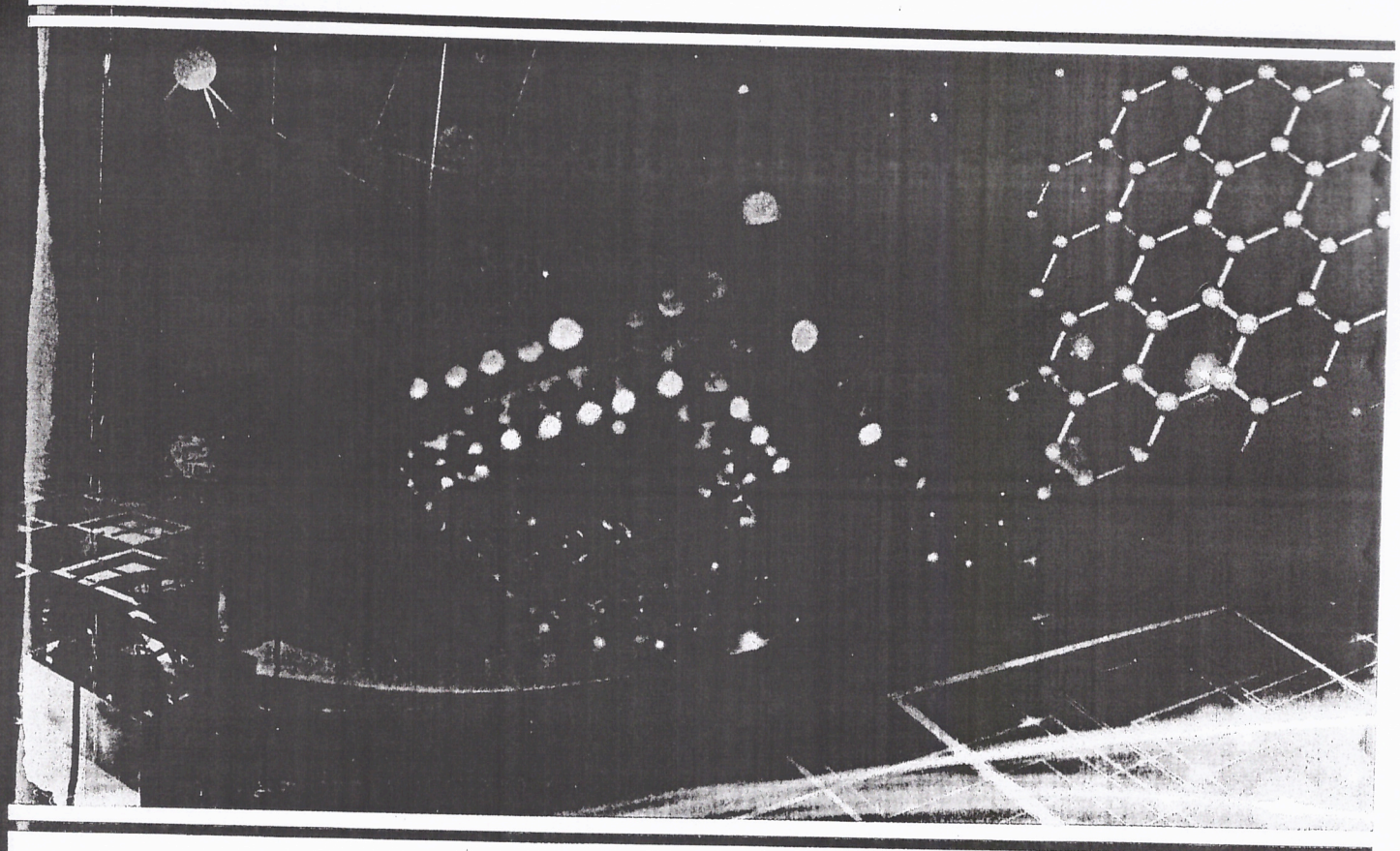

会刊 Conference Abstract Book

Title: Quercetin, Rutin and Quercetin-Rutin HPβ-Cyclodextrin Complexes: An *In Vitro* Evaluation

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Abstract

Flavonoids, such as Quercetin (3,3*,4*,5,7-pentahydroxyflavone) are antioxidants that scavenge damaging particles in the body known as free radicals, which damage cell membranes, tamper with DNA, and even cause cell death. Flavonoids as antioxidants can neutralize free radicals and may reduce or even help prevent some of the damage they cause. Rutin is also a flavonoid, having a significant scavenging properties on oxidizing species and is effective against ultra-violet radiation induced damages. Despite having superior characteristic properties low aqueous solubility which leads to poor bioavailability limits their use in pharmaceutical applications. Natural cyclodextrins (CD) are cyclic oligosaccharides consisting of six (α-CD), seven (β-CD), eight (γ-CD) or more glucopyranosyl units linked by α-(1,4) bonds. The most notable feature of CDs is their ability to form solid inclusion complexes (host–guest complexes) with a very wide range of compounds by a molecular complexation. Their unique cone shaped structure with hydrophilic outer surface while having an apolar cavity make CDs one of the most preferred systems for solubility enhancement studies. It was reported that the aqueous solubility of the β-CD is much lower than that of comparable highly soluble betacyclodextrin derivatives, like hydroxypropyl betacyclodextrins (HPβ-CD). This is thought to be due to relatively strong intermolecular hydrogen bonding in the crystal state. Therefore, in this study 12 different complexes of Quercetin and Rutin with HPβ-CD were prepared by both evaporation and lyophilization methods with [1:1] molar ratio in ethanol:water (1:1,v/v) solvent system. Yield value, entrapment efficacy and aqueous solubility were determined and *in vitro* characteristic properties of the complexes were evaluated by particle size, zeta potential, DSC, XRD, FT-IR and ^{1}H-NMR analyses. Analyses results demonstrated that HPβ-CD complexes were formed successfully and enhanced aqueous solubilities of both active agents were determined by HPLC analyses.

Biography

Dr. Müzeyyen Demirel has completed her Ph. D. study on "*In Vitro-In Vivo* Evaluation of Piribedil Incorporated Solid Lipid Nanoparticles" in 1999. She focused on formulation and characterization studies of inclusion complexes with CDs, nano-microparticulate drug delivery systems for pharmaceutical applications. She has over 15 publications about her research topics. Currently Dr. Demirel is working as an Associate Professor at the Anadolu University Faculty of Pharmacy Department of Pharmaceutical Technology since 2008.

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