Alzheimer's Treatment: Solubilized Curcumin via Trans-Buccal Patch

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Substantial research indicates that Curcumin may be a potent treatment for Alzheimer’s Disease. It’s water insolubility, degradation by alkalinity (small intestine) and tendency to be metabolized by the liver, however, have limited its in vivo utility. Prior experimentation resulted in the creation of a water-soluble Curcumin compound (“Compound J”). The purpose of this experiment was to determine whether the GI Tract could be bypassed by administering Compound J, via absorption, through the buccal mucosa using a Compound J-loaded buccal patch. A sodium alginate hydrogel was prepared and an aqueous Compound J solution added thereto. Glycerin (flexibility) and D-Limonene (penetration enhancer) were also added. The mixture was poured into petri dishes and air dried for two days. The resulting “thin film” was extracted and placed in a Franz Cell to test for absorption through a porcine buccal mucosa (pig cheek membrane). Each diffusion test (3) lasted 45 minutes at 37°C (body temperature) and used Phosphate Buffer Solution (pH 7.4) in both the receiving chamber, to replicate blood, and the donor chamber, to replicate saliva. The Franz Cell was placed on a rotary shaker, the agitation replicating blood flow. Solution from the receiving chamber was subjected to spectrophotometric analysis (Vernier UV-VIS Spectrophotometer) and the peak absorption frequency determined to be 470.1 nm. A 1 g/100 ml (0.01%) solution (Compound J and deionized water) was prepared and serially diluted three times (0.001%, 0.0001% & 0.00001%). The four solutions were spectrophotometrically analyzed and the concentration of Compound J from the Franz Cell comparatively determined using the Beer-Lambert’s Law. On trials 1-3, the concentrations were 60.1 mg/L,115.6 mg/L and 103 mg/L, respectively.