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Curcumin enhances cystic fibrosis transmembrane regulator expression by down-regulating calreticulin.

Harada K, Okiyoneda T, Hashimoto Y, Oyokawa K, Nakamura K, Suico MA, Shuto T, Kai H.

Department of Molecular Medicine, Faculty of Medical and Pharmaceutical Sciences, Kumamoto University, 5-1 Oe-honmachi, Kumamoto 862-0973, Japan.

Curcumin has been reported to correct cystic fibrosis caused by the DeltaF508 mutation of the cystic fibrosis transmembrane regulator (CFTR) but its mechanistic action remains unclear. We have recently demonstrated that the ER chaperone calreticulin (CRT) negatively regulates the CFTR cell surface expression and activity. Thus, we aimed at determining whether CRT mediates the effect of curcumin on CFTR.

We show here that the treatment with curcumin of Chinese hamster ovary cells suppressed CRT expression and increased wild-type CFTR but did not affect DeltaF508 CFTR expression. However, we determined that although curcumin did not augment DeltaF508 CFTR expression, it enhanced the functional competence of DeltaF508 CFTR induced by 26 degrees C incubation.

Knockdown of CRT by siRNA at low-temperature had a similar effect. Our findings suggest that the positive effect of curcumin on CFTR expression is mediated through the down-regulation of CRT, a negative regulator of CFTR.

Bharat B. Aggarwal, Ph.D.

Ransom Horne, Jr., Professor of Cancer Research Professor of Cancer Medicine (Biochemistry) and Chief, Cytokine Research Laboratory, Department of Experimental Therapeutics, The University of Texas M. D. Anderson Cancer Center, 1515 Holcombe Boulevard, BOX 143 Houston, TX 77030, USA

Phone: 713-794-1817

Email: aggarwal@mdanderson.org