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EGCG blocks tumor promoter-induced MMP-9 expression via suppression of MAPK and AP-1 activation in human gastric AGS cells.

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Overexpression of matrix metalloproteinases (MMPs) has been known to correlate closely with tumor cell invasion and strategies to down-regulate their expression may ultimately be of clinical utility. In this study, we investigated the effects of (-)-epigallocatechin gallate (EGCG), a major green tea catechin, on the cell invasiveness and MMP-9 induction in human gastric cancer AGS cells. EGCG inhibited the phorbol 12-myristate 13-acetate (PMA)-induced cell invasiveness and MMP-9 expression in a dose-dependent manner. EGCG treatment was found to reduce the MMP-9 transcriptional activity. To further study the mechanisms for the EGCG-mediated regulation of MMP-9, the effects of EGCG on transcription factor AP-1 and mitogen-activated protein kinase (MAPK) activities were examined. The results showed that EGCG suppressed the PMA-induced AP-1 activation. EGCG also abrogated the PMA-induced activation of extracellular-regulated protein kinase (Erk) and c-jun N-terminal kinase (JNK), which are upstream modulators of AP-1. These results suggest that EGCG may exert at least part of its anti-invasive effect in gastric cancer by controlling MMP expression through the suppression of MAPK and AP-1 activation.