

S-II-4

CHEMOPREVENTIVE STRATEGY IN POMEGRANATE (*PUNICA GRANATUM*): IMPLICATIONS FOR EVOLUTION AND TREATMENT

Huanbiao Mo¹, Wen Jiang², Ephraim Lansky³, and Moray Campbell⁴

¹Department of Food Science and Nutrition, Texas Womans University, Denton, Texas, USA

²Metastasis Research Group, University Department of Surgery, University of Wales College of Medicine, UK

³Rimonest Ltd., Science Park Technion, Nesher, Israel (drlansky@rimonest.com)

⁴Division of Medical Sciences, University of Birmingham Medical School, Birmingham, UK

Pomegranate (*Punica granatum*) is one of the worlds most ancient fruits, and also one of the most botanically isolated, comprising a single family (Puniceae) with its rare relative, *Punica protopunica*, a species limited in occurrence to the island of Socotra off the coast of Yemen. Pomegranate, though, is extremely well known, flourishes in many parts of the world, is traditionally prized for its medicinal properties and widely regarded as Symbol: of fecundity, longevity, spirituality and Medicine. We have studied extracts of pomegranate in selected *in vitro* systems for possible chemopreventive utility against human cancers, and found complementary activities. Specifically, pomegranate seed oil, which contains a conjugated trienoic fatty acid as its principal component, is a powerful inducer of apoptosis in several cancer cell lines. Tiny amounts of the oil also inhibit cancer cell invasion. Conversely, polyphenols from pomegranate juice and pericarp extracts inhibit cancer cell growth by different mechanisms, probably through interference with cell cycle. Possible explanations for the evolution of complementary chemopreventive mechanisms within a single plant are developed in terms of a plants self-defensive and reproductive strategies. Methods for exploiting this complementarity against human disease are considered, particularly for potential synergism. The discovery of dual chemopreventive activities within the pomegranate, with potential prophylactic and /or therapeutic utility in humans, suggests a new approach to devising improved and simplified combinations of plant-derived drugs for clinical application.