



## Excipients and Food Chemicals: More than merely coincidental bedfellows.

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It is no accident that quite a few naturally occurring food chemicals have found use as pharmaceutical excipients. Plant exudates, sugars, polyols, oils, glycerides, inorganic salts and secretions; among others, are widely used in foods and as excipients due to their innocuous pharmacological effects (or effects that modulate the biological efficacy of active drug compounds, see below), well established safety profiles, and usefulness in pharmaceutical manufacturing processes and formulations. Because they most often make up a large part (by weight) of the finished dosage form; and because formal regulatory procedures for approval of new excipients are currently sparse and ill-defined, research has focussed on developing either structurally modified forms of existing excipients and/or food chemicals or co-processed combinations of existing excipients that provide new functionality and/or ease of use. The Journal of Excipients and Food Chemicals is envisaged to capture and consolidate this wide gamut of research, which in turn, is expected to yield a more holistic picture than is currently possible with research “fragmented” in different Journals.

Excipients are increasingly being recognized as possessing properties that may modulate drug

bioactivity. They may affect the activity of drug metabolizing enzymes, modify drug pharmacokinetics, alter the efflux of drugs from cells or enhance gene transfection efficiency or nuclear localization. Such “adjuvant” effects may be “tunable” depending upon the structural modifications made to a naturally occurring food chemical. For example, the grafted polyoxyethylene or polyoxypropylene chain lengths, their positions or ratios have been shown to determine the P-glycoprotein (Pgp) efflux transporter inhibition exerted by vitamin E, castor oil, gallic acid and catechin, all of which are food chemicals. A knowledge of the structural basis for the pharmacological effects of food chemicals is therefore essential to designing more effective Pgp pump inhibitors, and consequently, to increase the effectiveness of chemotherapy.

Plant secondary metabolites (such as the alkaloids) have evolved partly as a protection against animal predation which, in their turn; have stimulated the evolution of drug metabolizing cytochrome P450 family of enzymes (CYP450 isozymes) in humans. It is therefore not unreasonable to assume that some plant constituents may modulate the pharmacokinetics (and thereby the biological activity) of specific drugs by their modulation of CYP450 isozymes. Such food constituents may serve as “bioactive excipients”.

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The method of extraction of naturally occurring excipients has been demonstrated to partly determine their physico-chemical properties in the finished state, which in turn affects their functionality as well as their vendor specific properties (or lack thereof). Much more attention seems to be paid to this aspect of the 'supply chain' of excipients in those Journals that are purely "food" related, such as "Food Hydrocolloids" or "Food chemistry", than in Journals that are deemed to be "Pharmaceutical". It may be that this disconnect is not readily discernible to the pharmaceutical community or that a literature search may not reveal this aspect of the upstream excipient supply chain depending on the databases searched. The Journal of Excipients and Food Chemicals attempts to bring together research concerning all the processes and methods that are used to manufacture natural excipients all the way upstream to their point of extraction; and downstream to the point of sale. By presenting an amalgamation of such seemingly diverse, yet 'functionally connected', research in one journal, it is hoped that the finished properties of such excipients may be better understood *vis-a-vis* their extraction/manufacture, and controlled with a consequent maximization of functionality and a minimization of pharmaceutical process variability, when incorporated into pharmaceutical dosage forms.

New paradigms for using excipients in pharmaceutical dosage forms must incorporate, in no small measure, an intimate knowledge of the structure, function and properties of food chemicals, from which such excipients may be expected to evolve. Because these two entities, food chemicals and excipients, are inextricably and teleologically intertwined, the presentation of empirical investigation about them in one platform makes more sense, is more likely to elevate information to knowledge and to drive Kuhnian paradigm shifts. The Journal of Excipients and Food Chemicals endeavors to be that platform.

Shakespeare says that misery acquaints a man with strange bed-fellows! How much misery might we avoid by combining the learnings of these two not so strange bedfellows, food ingredients and pharmaceutical excipients?