Virtual Screening of Chinese Herbs with Random Forest: Supplementary Information

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(1) **Description of the major therapeutic categories of Traditional Chinese Medicine** Appendix 1 gives brief descriptions of the main categories in which herbs are grouped in Chinese medicine. There is a high degree of uniformity between different materia medica, both in terminology and in the herbs found in each category. Equivalent Western categories, though not entirely satisfactory, provide some degree of insight into how TCM might be translated into the language of Western medicine and the work of Bensky et al. (ref 25 of main text) provides a useful starting point in bringing together the two traditions. This is the major source of the information in Appendix 1. Signs and symptoms associated with each category are again fairly standard in introductory texts on TCM, though it should be stressed that these only cover a limited number of the total spectrum, and more specialized disciplines, such as TCM dermatology, use their own highly specific forms of diagnosis and symptomatology.

TCM category	Western equivalent (approximate)	Signs & Symptoms/Conditions
<i>Antitussive</i>	Antitussive, Expectorant, Antibiotic, Diuretic, Laxative	Cough (persistent), wheezing
<i>Aromatic Digestive</i>	Digestive stimulant	Distention, nausea, vomiting, poor appetite, greasy tongue coating
<i>Astringent</i>	Astringent, endocrine agent	Diarrhoea, polyuria, sweating, prolapse, discharge
<i>Cathartic</i>	Cathartic	Oedema (severe), ascites, pleurisy
<i>Damp Heat</i>	Antimicrobial, Antipyretic, Anti-inflammatory	Dysentery, urinary difficulty, jaundice, skin disease (eg. eczema)
<i>Diuretic</i>	Diuretic	Oedema, urinary dysfunction, damp sores, damp warm febrile disease, jaundice, heart disease.
<i>Fire Poison</i>	Detoxicant, Anti-	Painful swellings, purulent

TCM category	Western equivalent (approximate)	Signs & Symptoms/Conditions
	inflammatory, Antimicrobial, Antiviral, Diuretic	infections, abscess, dysentery, certain viral infections (mumps, encephalitis), skin disease
<i>Heat (Blood)</i>	Refrigerant, Styptic, Coagulant	Fever, rash, nosebleed, vomiting blood, blood in stool & urine, skin disease (certain types)
<i>Heat (Qi)</i>	Refrigerant, Antipyretic, Anti-inflammatory, Antimicrobial	High fever, irritability, thirst, delirium, skin disease (certain types)
<i>Internal Cold</i>	Circulatory stimulant, Cardiotonic	Cold extremities, lack of thirst, loose stool, nausea, diarrhoea, chest & abdominal pain, slow pulse
<i>Internal Wind</i>	Antihypertensive, Sedative, Nerve tonic	Tremor, spasm, hemiplegia, aphasia, paralysis, blurred vision, dizziness, paraesthesia, stroke
<i>Invigorate Blood</i>	Anticoagulant, Circulatory stimulant	Pain (severe, fixed), abscesses, ulcers, abdominal masses, thrombosis, ischemia
<i>Laxative</i>	Purgative, Laxative	Constipation
<i>Nourish Heart</i>	Tranquillizer, Sedative, Nerve Tonic	Palpitations, anxiety, insomnia
<i>Open Heart</i>	Resuscitant, Tranquillizer, Stimulant	Delirium, seizure, coma
<i>Phlegm Cold</i>	Expectorant, Decongestant, Antibiotic	Cough (productive), phlegm
<i>Phlegm Heat</i>	Expectorant, Antitussive, Anti-inflammatory, Sedative	Cough (dry), scrofula, goitre, convulsions
<i>Regulate Qi</i>	Digestive stimulant, Circulatory stimulant, Analgesic	Pain (epigastric, hypochondriac and abdominal), diarrhoea/constipation, irregular menstruation, stifling sensation in chest
<i>Stop Bleeding</i>	Styptic	Bleeding, vomiting & coughing blood, haematuria, excessive menstruation, trauma
<i>Summer Heat</i>	Sickness due to heat	Aversion to heat, sweating,

TCM category	Western equivalent (approximate)	Signs & Symptoms/Conditions
		oliguria, thirst, rapid pulse
<i>Tonify Blood</i>	Haematinic	Pallor, dizziness, vertigo, poor vision, lethargy, palpitations, amenorrhea, insomnia, pale tongue, fine pulse
<i>Tonify Qi</i>	Endocrine agent, immunostimulant	Lethargy, weakness, poor appetite, weak voice, pale complexion, breathlessness
<i>Tonify Yang</i>	Endocrine agent	Systemic exhaustion, fear of cold, cold extremities, withdrawal, sore & weak lower back, slow & deep pulse
<i>Tonify Yin</i>	Endocrine agent, Antidiuretic, Antihypertensive, Anticholesterolaemic	Dizziness, tinnitus, weak lower back and knees, low-grade fever, menopausal symptoms, scanty dark urine, red dry tongue, thin pulse
<i>Wind Cold</i>	Diaphoretic	Chills, headache, body & neck pain, no fever/mild fever
<i>Wind Damp</i>	Antirheumatic, Analgesic, Antipyretic, Anti-inflammatory, Anticoagulant	Rheumatic conditions, pain & numbness (eg. muscles, joints).
<i>Wind Heat</i>	Diaphoretic	Fever, sore throat, mild chills. Also used for rashes and eye problems

Appendix 1. TCM categories and their description.

(2) **Full set of skeletal types for all targets** In Appendix 2 the full set of 75 skeletal types identified among hits for all targets is shown. Stereochemistry and nomenclature follows that given in the *Dictionary of Natural Products* (ref 15 of main text).

<p><i>Aporphine alkaloid</i></p>	<p><i>Benzyloquinoline alkaloid</i></p>	<p><i>Furanoquinoline alkaloid</i></p>	<p><i>Protoberberine alkaloid</i></p>
<p><i>Protopine alkaloid</i></p>	<p><i>Quinazoline alkaloid</i></p>	<p><i>Isobutylamide (variable chain)</i></p>	<p><i>Acetylene (example)</i></p>
<p><i>Branched aliphatic (example)</i></p>	<p><i>Unsaturated fatty acid (example)</i></p>	<p><i>Disulfide (example)</i></p>	<p><i>Monocarboxylic (example)</i></p>
<p><i>Aldaric acid (variable, main features)</i></p>	<p><i>Cyclitol (example)</i></p>	<p><i>Long chain aromatic (variable chain)</i></p>	<p><i>Diarylalkyl (variable chain)</i></p>
<p><i>Phenol</i></p>	<p><i>Phenylpropanoid</i></p>	<p><i>Biphenyl</i></p>	<p><i>Diphenyl ether</i></p>
<p><i>Benzophenone</i></p>	<p><i>Xanthone</i></p>	<p><i>Dibenzyl</i></p>	<p><i>Stilbene</i></p>

<i>Anthracene</i>	<i>Anthraquinone</i>	<i>Phenanthrene</i>	<i>Naphthalene</i>

<i>Coumarin</i>	<i>Acylphloroglucinol</i>	<i>Dibenzylbutane lignan</i>	<i>Dibenzocyclooctadiene lignan</i>

<i>Furofuranoid lignan</i>	<i>Neolignans (two types)</i>	<i>Chalcone</i>	<i>Flavone</i>

<i>Flavonol</i>	<i>Dihydroflavonol</i>	<i>Flavan-3-ol</i>	<i>Flavan-3-one</i>

<i>Anthocyanidin</i>	<i>Isoflavone</i>	<i>Isoflavan</i>	<i>Pterocarpan</i>

<i>Biflavonoid</i>	<i>Condensed tannin (variable units)</i>	<i>Hydrolyzable tannin (example)</i>	<i>p-Menthane monoterpene</i>

<i>Iridoid monoterpene</i>	<i>Bisabolane sesquiterpene</i>	<i>Clovane sesquiterpene</i>	<i>Eudesmane sesquiterpene</i>

<i>Germacrane sesquiterpene</i>	<i>Germacranolide sesquiterpene</i>	<i>Guaiane sesquiterpene</i>	<i>Guaianolide sesquiterpene</i>

<i>Xanthane sesquiterpene</i>	<i>Abietane diterpene</i>	<i>Ingenane diterpene</i>	<i>Kaurane diterpene</i>

<i>Labdane diterpene</i>	<i>Pimarane diterpene</i>	<i>Hopane triterpene</i>	<i>Lupane triterpene</i>

<i>Bauerane triterpene</i>	<i>Friedelane triterpene</i>	<i>Glutinane triterpene</i>	<i>Oleanane triterpene</i>

<i>Ursane triterpene</i>	<i>Dammarane triterpene</i>	<i>Cycloartane triterpene</i>	<i>Lanostane triterpene</i>

<p><i>Furostan sterol</i></p>	<p><i>Spirostan sterol</i></p>	<p><i>Carotenoid (example)</i></p>	
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Appendix 2. Full set of skeletal types identified for all targets.

(3) References to the scientific literature in Table 8

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