

Herb Pharmacology

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What is Chinese Herb Pharmacology?

The purpose of the Chinese Herb Pharmacology:

Find out how the herb works & the processing of metabolize in the human body

The content of the Chinese herb pharmacology:

Pharmacodynamics of TCM: ingredients research

Pharmacokinetics of TCM: metabolize processing

The History of Chinese herb pharmacology

1. Ancient research of Chinese herb pharmacology
“Correspondence between nature and human 天人相應”
2. Comparing the development between Western Medicine & Chinese Medicine



Herb Pharmacological action character & research

中药药理作用的特点及研究思路

<1>. Herb Pharmacological action character 中药药理作用的特点:

1. Herb actions' duality 中药作用的两重性

(1) Address both the symptoms and root cause 标本兼治

(2) Therapeutic actions and side-effects 治疗作用与不良反应

2. Herb actions' differentiation 中药作用的差异性

(1) Species differentiation 种属差异

(2) Unit differentiation 个体差异

3. Dose-effect relationship of Chinese herb 中药作用的量效关系

4. Time-effect relationship of Chinese herb 中药作用的时效关系

5. Herb actions' bi-directional character 中药作用的双向性

(1) dosage & chemical compounds 剂量大小与化学成分

(2) Physiology & Pathology status 不同生理或病理状态



Drug nature,

Drug taste,

Lifting-Lowering-Floating-Sinking,

Channel Tropism(affinity)

Toxicity of TCM

Drug Nature

	<u>Cold & Cool</u>	<u>Hot & Warm</u>	<u>Even</u>
<u>TCM treatment</u>	Clear Heat; Cool the heat toxin in Blood; Clear Empty Heat; Phlegm-heat; Promote defecating; Promote urination; Nourish Yin; Calm down liver wind;	Warm the internal cold; Expel the external cold; Tonify the Yang Qi; Warm up the meridian; Rescue the exhausted Yang;	Could be widely used;
<u>Herb</u>	Shi Gao; Jin Yin Hua; Qin Hao; Gua Lou; Da Huang; Shen Di; Ling Yang Jiao	Gang Jiang; Gui Zhi; Ma Huang; Fu Zi; Du Huo; Rou Gui;	Gan Cao;



**Warm
&
Hot**

↑ Autonomic nerve system function	1. Fu Zi, Gan Jiang, Rou Gui, Ru Rong could increase Sympathetic nerve – adrenal gland system function, DβH activity, CA contents.
	2. Increase Adr, DA, DβH contents in the brain
	3. Increase cAMP contents in the cells, get cAMP/cGMP Ratio right
Affect central nervous system	1. Excitatory Neurotransmitter: Noradrenalin (NA)、 Dopamine (DA)↑;
	2. Inhibitory Neurotransmitter :5-hydroxytryptamine (5-HT)↓
↑ Endocrine system function	1. Ren Shen: Sex hormone like effects; ↑ 17OHCS & TSH in the blood
	2. Yin Yang Huo: ↑Adrenal cortex 肾上腺皮质
↑ energy metabolism & thermogenesis	1. Ma Huang: ↑energy metabolism
	2. Decompose glycogen, ↑Blood sugar: Lu Rong, Ma Huang, He Shou Wu, Ma Huang Tang, Gui Zhi Tang, Xiao Qing Long Tang
	3. ↑ Oxygen-consumption
↑ Cardiovascular sys. function	↑ Heart rates; ↑ Blood pressure: Fu Zi, Wu Tou , Ma Huang

Warm & Hot	↓ Autonomic nerve system function	1. Fu Zi, Gan Jiang, Rou Gui, Ru Rong could decrease Sympathetic nerve – adrenal gland system function, ↓DβH activity, ↓CA contents.
		2. ↓DβH contents in the brain; ↑ 5-hydroxytryptamine (5-HT)
		3. Increase cGMP contents in the cells, get cAMP/cGMP Ratio right
	Affect central nervous system	1. Quickly & strongly ↑ 5-hydroxytryptamine (5-HT);
		2. Sedation, Convulsion resistance: Gou Teng, Zhi Zi, Huang Qin, Dan Pi, Chi Shao
	Endocrine system function	1. ↓ 17OHCS & TSH in the blood
		2. ↓Adrenal cortex 肾上腺皮质 Shi Gao, Zhi Mu, Huang Qin
	↓ energy metabolism & thermogenesis	1. ↓ Oxygen-consumption: Shi Gao, Zhi Mu, Huang Qin
		2. ↓ Blood sugar
		3. ↓ Na ⁺ , K ⁺ -ATP activity
↓ Cardiovascular sys. function	↓ Heart rates; ↓Blood pressure: Ge Gen, Huang Qin, Huang Lian	
Others:	Antibiosis; Antivirus; Antipyretic解热; Antineoplastic	

Drug Taste

	<u>Spicy</u>	<u>Sweet</u>	<u>Bitter</u>	<u>Sour</u>	<u>Salty</u>
Function	Disperse		Sedate heat	Stabilize & bind	Purge excess
	Move Qi & Blood	Tonifying,	Down draining	Astringing	Softening
		Harmonize	Purge fire		Moistening
			Dry dampness		Entrance to Kid.
Contra-Indication	All types of Def.	Dampness	Pregnant women	Any condition of excess: Damp or Stagnation	Fluid accumulation
		Exterior Wind	Prolapse		Damp
			Diarrhea, Profuse urine		Loose stools
			Sp. Def. , Blood Def. , Yin def.		





Herb Pharmacology

中藥藥理學

Taste	Herbs	Ingredients	Feature
Acrid	Dispersing wind herbs; Regulate Qi Herbs	Essential Oil (Glucoside 苷类, Alkaloid)	Diaphoretic 发汗、 Antipyretic 解热、 Promote digestion 健胃、 vasodilatation 扩张血管
Sour	Astringent Herbs; Stop Bleeding herbs;	Organic acid; Tannic acid;	Anti-diarrhoica; Hemostasis; Antibiosis; Anti-inflammatory;
Sweet	Tonifying herbs; Calms mind herbs;	Sugar; Protein	Nutrition; Enhance immune system;
Bitter	Downward draining Herbs; Clear heat herbs	Alkaloid; Glucoside;	Lapactic; antitussive 止咳; Anti-asthma; Expectorant; Detumescence 消肿; Tonify Kidney;
Salty	Transform phlegm herbs; Tonify & warm kidney herbs;	Na ⁺ , K ⁺ mineral	Lapactic; Expectorant; Detumescence; Tonify Kidney;

Lifting-Lowering-Floating-Sinking

Modern research:

1. Two implications:

<1>. Actions' trend & pharmacology actions

<2>. Light or heavy Quality

2. Lifting-lowering-floating-sinking has strong relationship with herbs' taste



Channel Tropism(affinity)

1. Relationship with Pharmacodynamics.
2. Relationship with Pharmacokinetics
3. Relationship with Receptor Theory
4. Relationship with cAMP/cGMP
5. Relationship with herb's Mineral ingredients



Toxicity of TCM

1. Acute poisoning

- a. Affect Central Nerve System: Wu Tou, E Zhu, Han Fang Ji (Alkaloid)
- b. Affect Cardiovascular system: Fu Zi (Alkaloid, Cardiac Glycoside)
- c. Affect Respiratory system: Xing Ren, Tao Ren, Bai Guo (cyanogenic glycoside)

2. Chronic poisoning

- a. Affect Digestive System: Ku Shen
- b. Affect Blood system: Lei Gong Teng
- c. Affect Liver & Kidney: More than 100 herbs have side-effects to Liver & Kidney.

3. Allergic reaction:

About 150 kinds of herbs: Do Long, Wu Wei Zi

4. Teratogenesis: Xi Xin, Bing Lang, Kuan Dong Hua



The elements influence the herb's pharmacological action 影响中药药理作用的因素

1st. Herb element 药物因素

- A. 品种 Variety
- B. 产地 Production Place
- C. 采集季节和药用部位 Collecting season
- D. 贮藏条件 Storage
- E. 炮制 Processing
- F. 剂型和制剂 Formulation & Preparation
- G. 剂量, 煎煮方法和条件 Dosage, Decoction & Condition
- H. 配伍和妊娠禁忌: Contraindication of compatibility of medicines and pregnancy



2ed: Organic factor 机体因素

A. Physiology factor 生理因素

B. Pathology factor 病理因素

3rd: Environment factor 环境因素

Geography 地理条件、

Climate 气候、

Food & Drinking 饮食、

Daily life 起居不同、

Daily rhythmicity 昼夜节律性、

Hormone secretion 激素分泌、

Nerve activity 神经活动等均可影响药物的疗效果。

Processing of herbs

Purpose of processing herbs

- To reduce the impurity
- Cut to pieces & convenient for using
- To dry the herbs & convenient for storage
- To reduce the stinky & bad smell
- To reduce toxicity
- To change the property of herbs
- Moderate strong property of herbs
- To guide the herbs to special channels

Ma Huang	Sweating	Zhi Ma Huang	Stop coughing & wheezing
Gan Cao (Cool)	Detoxification & dissolve phlegm	Zhi Gan Cao (Warm)	Tonify Spleen Qi & Stop Pain
Shen Di Huang (Bitter & Cold)	Clear heat; Cool Blood	Shu Di Huang (Warm)	Tonify blood & Yin

Mechanical methods

Methods which utilize water		
Aqueous trituration (水飛)	Minerals (get rid of toxic)	Hua Shi; Pearl;
Methods which utilize heat		
Dry-frying (炒)	Fry to yellow; brown or black	Chao Mai ya; Jin jie tan;
Frying with liquids (炙)	With wine (moving blood)	Dang Gui; Chuan Xiong; Niu Xi
	With Vinegar (stop pain<liv.>)	Xiang Fu; Cai Hu
	With honey (Tonify)	Zhi Gan Cao; Zhi Pi Pa Ye
Calcining (煨)	Minerals & shells (render the substance brittle & easy to pulverize)	Long Gu; Mu li; Dai Zhe Shi
Dry Curing or Baking (烘焙)	Processing flowers & insects	Rose; Tu Bie Chong
Roasting in ashes (煨)	Reduce aromaticity herbs' side-effects	(Wei)Mu Xiang; (Wei) Shen Jiang

