

March 25, 2010

Cree healing plants, Chinese plants, and western medicines: Are they safe to take together?*

Purpose

Rui's thesis looked at how safe it is to take plant medicines and western medicines together. He looked at how the 17 Cree plants, and 8 traditional Chinese plants, act on the enzymes that regulate how our bodies handle medicines and some other things.

Background

People have been using certain plants as medicines for thousands of years, so we know these plants are safe and fairly free from side effects. But we don't always know if it's safe to take plant medicines and western drugs together. As more and more people turn to natural health products (like plants or vitamins), it is becoming urgent to know this. We need to be sure that the healing plants and western drugs don't interfere with each other.

About how we absorb drugs and plant medicines

People vary a lot in how they respond to medicines. Things like our ancestry, sex, diet, smoking habits, and whether we have diabetes can all affect how well a medicine works for us. We all have things called "enzymes" in our liver and guts that help our bodies to handle drugs and plant medicines. Different people have different amounts of these enzymes. This is part of the reason why one person may react strongly to a medicine while another will get little or no effect.

We all have many different types of these enzymes. Some of them are quite specialized, and only handle one type of ingredient. Others work on many different kinds of drugs. Over time, scientists have identified which enzymes help us absorb the various western drugs. But we know that some plants can interfere with these enzymes. They may just hinder the enzymes, or they may put them completely out of action. (This is called "mechanism-based inhibition.") When this happens, the enzymes aren't free to handle the western drug. Because the enzymes can't do their job properly, the person may absorb far too much western drug (overdose) or far too little.

The same thing can happen if a western drug interferes with the enzymes our bodies need to handle a plant medicine. The result can be that we get too much or too little of the plant medicine.

Because there are so many of these enzymes, we can't test all of them. Instead, Rui focused on ten enzymes that we know act on drugs, especially the kinds of drugs that people take when they have diabetes. He paid special attention to an enzyme called CYP3A4. This enzyme is a sort of "multi-purpose"

* This is a plain-language version of Rui Liu's Master's thesis, called *Effects of Natural Health Products on Drug Metabolism: Implications for Pharmacovigilance*. (Draft of March 18, 2010). The thesis also contains an article that was previously put into plain language as "Could plant medicines affect how well Tamiflu works?"

one. It acts on over half the drugs on the market, so anything that interferes with it can cause major problems. Rui also looked at some enzymes that act on fewer drugs, but play a role in how our bodies handle fat and estrogen.

Having chosen the enzymes, Rui then tested whether various plant medicines interfere with them. He tested all 17 of the Cree plants that we've been looking at. And he tested eight plants used in Chinese medicine, especially one called Goji (wolfberry). Goji is widely used in East Asia, and is also sold here in Canada. People use fresh Goji berries, dried berries, or Goji juice.

Could the Cree plants interfere with western drugs?

Rui found that a lot of the Cree plants did interfere with the enzymes.

- Crucially, seven plants seriously interfered with the multi-purpose enzyme (CYP3A4) that helps our bodies handle so many different western drugs. At least three of these plants put the enzyme completely out of action. This is serious, because it can take our bodies up to three days to make new enzyme. We should be careful about mixing black spruce cones, speckled alder bark, pitcher plant leaves, or lowbush cranberries with many western drugs.
- Jack pine cones, black spruce cones, diamondleaf willow leaves, and creeping snowberries interfered with an enzyme called CYP4A11. This enzyme doesn't act on many drugs, but it plays a role in how our bodies handle fats. Interfering with it could cause people to store more fat in their livers. That in turn could make people more insulin-resistant, and make diabetes worse.
- Just one plant medicine—showy mountain ash bark—interfered with enzyme CYP19. Changes in this enzyme can affect our estrogen levels and cause problems due to too much or too little estrogen.

Could the Chinese plants interfere with western drugs?

Rui found that several of the Chinese plants interfered with the multi-purpose enzyme. One Chinese plant also interfered with an enzyme (CYP2D6) that acts on important heart drugs. This enzyme comes in different “flavours” (gene polymorphisms), with Chinese and Japanese people having more of one flavour, and whites having more of another. Rui had thought that the plant's effects on the enzyme might vary with its flavour, but they didn't seem to. This suggests that the plant would probably work the same way in other people as it does in Chinese and Japanese people.

Rui then looked more closely at the effects of Goji berries and juice. Goji—especially the juice—did seem to interfere with several enzymes. Goji had effects on

- an enzyme that acts on some drugs used to treat diabetes and heart problems (CYP2C9)
- an enzyme that acts on some kinds of anti-depressant and anti-seizure drugs (CYP2C19)
- an enzyme that works on estrogen (CYP19)
- an enzyme that we think plays a role in heart health (CYP2J3)
- the “multi-purpose” enzyme (CYP3A4)

Summary

All in all, Rui concluded that many of these traditional plants—both the Cree and the Chinese ones—could interfere with western drugs (and vice-versa). We will really need to be careful when mixing traditional and western remedies.

To be the same as the rest of the studies in the Anti-diabetic Plant Project, Rui used plants dissolved in ethanol. The results are a warning to us that the plants and western drugs may not mix well. But now that we see that this is a possibility, we really need to take a closer look at what happens when we prepare the plants the same way the healers do.

Cree plants used in this study			
Cree Name	English name	Latin name	Part used
Innasht	Balsam fir	<i>Abies balsamea</i> (L.) Mill.	Bark
Atushpi	Speckled alder	<i>Alnus incana</i> ssp. <i>Rugosa</i> (Du Roi)	Bark
Pieuminaan	Creeping snowberry	<i>Gaultheria hispidula</i> (L.) Muhl.	Fruit
Kahkachiminahtikw	Common juniper	<i>Juniperus communis</i> L.	Fruit
Uishichipukw	Sheep laurel	<i>Kalmia angustifolia</i> L.	Leaves
Watnagan	Tamarack	<i>Larix laricina</i> K.Koch	Bark
Pashtanhoagin	Stag's horn clubmoss	<i>Lycopodium clavatum</i> L.	Whole
Minhikw	White spruce	<i>Picea glauca</i> (Moench) Voss.	Leaves
Innahtikw	Black spruce	<i>Picea mariana</i> (Mill.) BSP.	Cones
Ushchishk	Jack pine	<i>Pinus banksiana</i> Lamb.	Cones
Mitus	Balsam poplar	<i>Populus balsamifera</i> L.	Bark
Kachichpukw	Labrador tea	<i>Rhododendron groenlandicum</i>	Leaves
Wishichipikushh	Marsh Labrador tea	<i>Rhododendron tomentosum</i>	Leaves
Pieuatikw	Diamondleaf willow	<i>Salix planifolia</i> Pursh	Leaves
Ayigadash	Pitcher plant	<i>Sarracenia purpurea</i> L.	Leaves
Mushkuminanatikw	Showy mountain ash	<i>Sorbus decora</i> (Sarg.) Schneid.	Bark
Wishichimna	Lowbush cranberry	<i>Vaccinium vitis-ideae</i> L.	Fruit

Chinese plants used in this study

Common name	Latin name	Part used
Chrysanthemum flower	<i>Dendranthema morifolium</i>	Flower
Kudzu vine roots	<i>Radix Puerariae</i>	Root
Isatis roots	<i>Radix Isatidis</i>	Root
Du Huo	<i>Radix Angelicae Pubescentis</i>	Root
Chai Hu	<i>Radix Bupleuri</i>	Root
Indian Bread with Hostwood	<i>Sclerotium poriae Circum Pini</i>	Root with fungi
Dan Shen	<i>Radix Codonopsis</i>	Root
Goji	<i>Lycium barbarum.L</i>	Fruit
