Impact of plants on anticancer drugs metabolism: development of a database to facilitate the pharmacist's expertise

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Background

Phytotherapy's market keeps growing for several years.

However, in oncology, concomitant use of plants with oral or injectable chemotherapies can be harmful. Plants can interact with many cytochromes (CYP), impacting the biotransformation and kinetics of drugs. While grapefruit or St. John's wort are already recognized as interfering with many therapies, the impact of many plants remains unknown for healthcare professionals. Tools exist to evaluate their effects on drug's metabolism, but the multiplication of sources delays and complicates the advice of pharmacist.



Aims

Centralize informations on plant's metabolism on a single support by creating a database

Facilitate pharmacist's expertise about interactions between plants and anticancer drugs.

Material and methods

To create the database, it was necessary to establish an exhaustive list of plants:

Inventory of phytotherapy's products marketed in 4 drugstores

3 sources Census of plants consumed by patients seen in pharmaceutical consultation (PC)

Consultation of websites specialized in phytotherapy

A Excel table has been developed:

- each line = plant
- each column (respectively) = 17 CYP, a transport protein (Pgp), estrogen-like (EL) and antioxidant (AO)

A **colour code** has been defined according to the inhibitory (yellow), inductive (blue), EL (purple) and AO (red) action of the plant.

Plant effects data were collected from Hedrine®, Oncolien®, MSKCC, RX list and Drugs.com websites.

Results

→ 174 plants have been accounted in drugstores

→ 82 were identified during PC

→ 29 founded on websites.



Total of 285 plants

Table 1. Extract from our Excel table on plant metabolism

	Traduction anglaise	Nom commun	INHIBITEUR-INDUCTEUR DES CYTOCHROMES P450 ET PgP + EFFET PHYTO-OESTROGENE + EFFET ANTI-OXYDANT															SENE +				
			1A 1	1A 2	1B 1	2A 6	2B 1	2B 6	2C 6	2C 8	2C 9	2C 19	2D 6	2D 9	2 E1	3A 4	3A 5	3A 7	3A 11	<u>p</u> - gp	estrogen like	Anti- oxydant
Allium <u>sativum</u>	GARLIC	AIL																				
Matricaria recutita	CHAMOMILE	CAMOMILLE MATRICAIRE (Allemande)																				
Curcuma longa	TURMERIC	CURCUMA																				
Ginkgo biloba	GINKGO BILOBA	GINKGO BILOBA																				
Glycine max	SOY	LECITINE DE SOJA																				
Aesculus Hippocastanum	HORSE CHESTNUT	MARRONNIER D INDE																				
Zea maïs	CORN	MAÏS																				
Mentha piperita L.	PEPPERMINT	MENTHE POIVREE																				
Hypericum perforatum	ST JOHN'S WORT	MILLEPERTUIS																				
Citrus maxima	GRAPEFRUIT	PAMPLEMOUSSE																				
Glycyrrhiza glabra	LICORICE	REGLISSE																				
Rosmarinus officinalis	ROSEMARY	ROMARIN																				
Crocus sativus	SAFFRON	SAFRAN																				
Salvia officinalis	SAGE	SAUGE																				

Since tool's creation: 91% of answers could be given immediately to patients compared to only 9% delayed (plants still unreferenced).

Conclusion and relevance

This database is an essential tool for answering questions from patients with anticancer drugs.

It saves precious time and responsiveness during PC, but also during phone calls of patients. However, critical work with divergent informations between sources is to be expected (Green box in our table). Currently, as a precaution, we don't recommend the use of plants subject to such a contradiction.



