

# TCM2COVID: A Resource of Anti-COVID-19 Traditional Chinese Medicine with Effects and Mechanisms

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TCM2COVID: A Resource of Anti-COVID-19 Traditional Chinese Medicine with Effects and Mechanisms. *iMeta* e42.  
<https://doi.org/10.1002/imt2.42>

# Background

## The current state of the global pandemic



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# Background



Integration of Chinese and Western

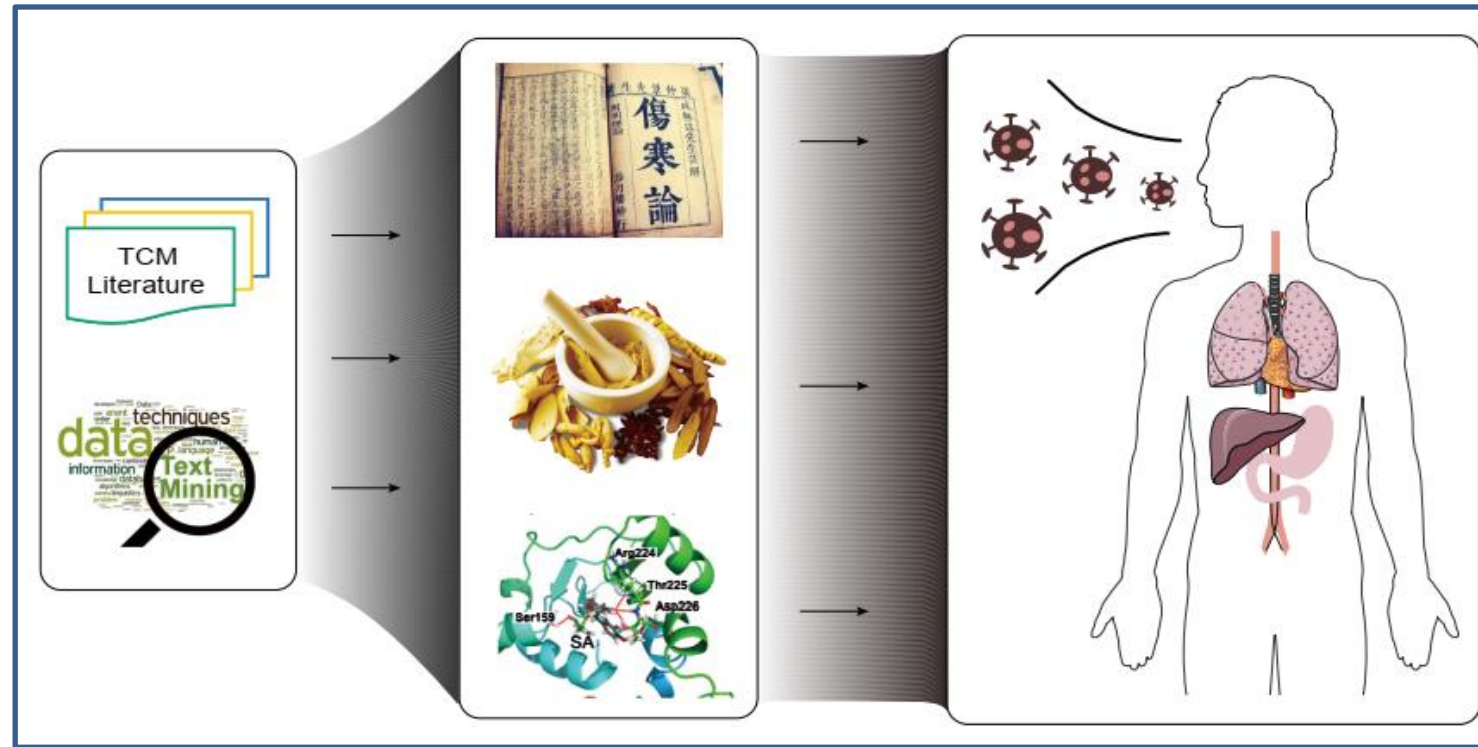


Three drugs and three prescriptions

Liping Ren, Yi Xu, Lin Ning, Xianrun Pan, Yuchen Li, Qi Zhao, Bo Pang, Jian Huang, Kejun Deng, Yang Zhang. 2022.  
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# Database construction

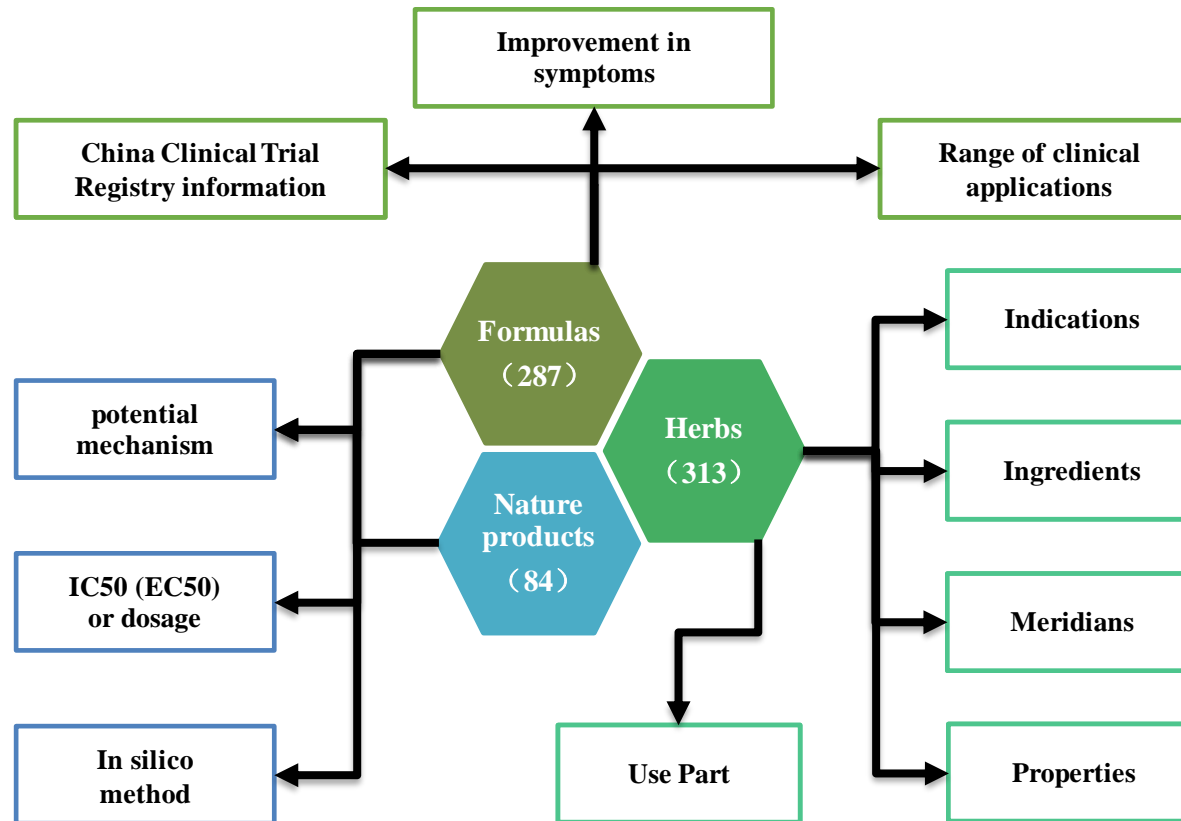
## Basic architecture of TCMCOVID database



Liping Ren, Yi Xu, Lin Ning, Xianrun Pan, Yuchen Li, Qi Zhao, Bo Pang, Jian Huang, Kejun Deng, Yang Zhang. 2022. TCM2COVID: A Resource of Anti-COVID-19 Traditional Chinese Medicine with Effects and Mechanisms. *iMeta* e42. <https://doi.org/10.1002/imt2.42>

# Database construction

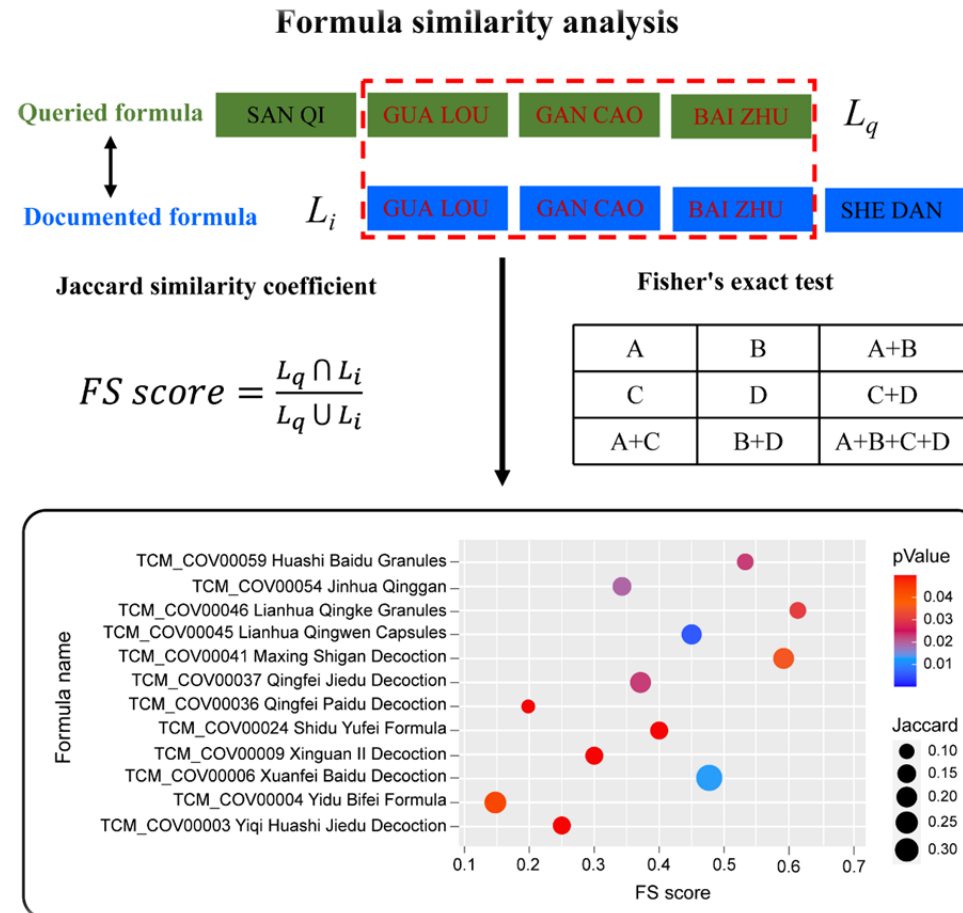
Statistics, annotation and organization of the TCM formulas, herbs and NPs data



Liping Ren, Yi Xu, Lin Ning, Xianrun Pan, Yuchen Li, Qi Zhao, Bo Pang, Jian Huang, Kejun Deng, Yang Zhang. 2022. TCM2COVID: A Resource of Anti-COVID-19 Traditional Chinese Medicine with Effects and Mechanisms. *iMeta* e42. <https://doi.org/10.1002/imt2.42>

# Database construction

Schematic diagram of the webserver for formula similarity analysis.

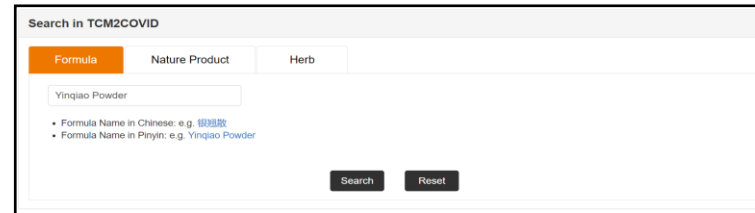


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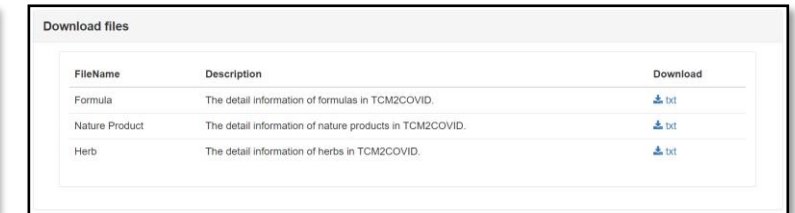
# Main page

Web interface of TCM2COVID. Users can link to the Search, Download, Webserver, Statistics and Help pages via the navigation bar.

Search page

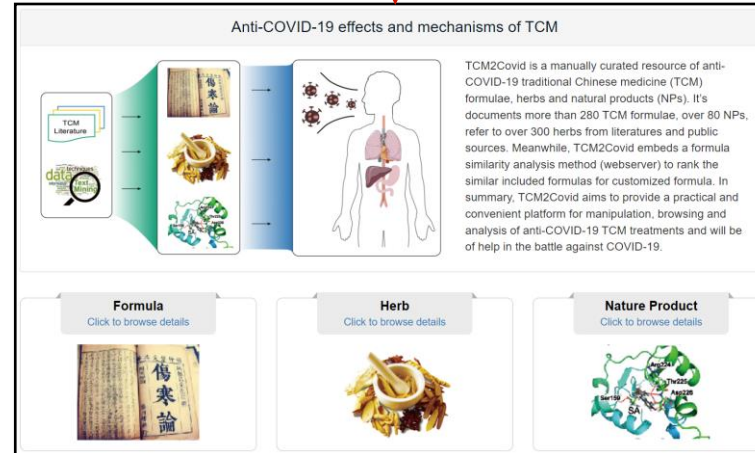
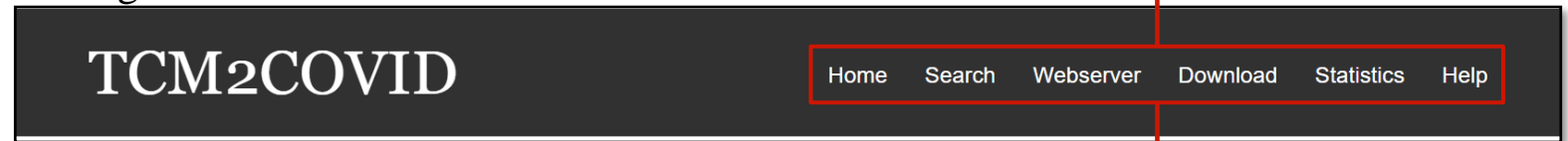


Download page

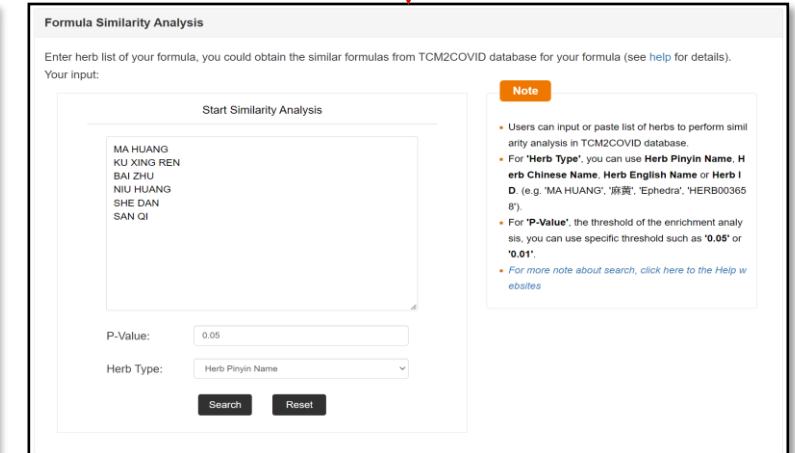


FileName	Description	Download
Formula	The detail information of formulae in TCM2COVID.	<a href="#">Download</a>
Nature Product	The detail information of nature products in TCM2COVID.	<a href="#">Download</a>
Herb	The detail information of herbs in TCM2COVID.	<a href="#">Download</a>

Navigation bar



Home and Browse page



Webserver

Liping Ren, Yi Xu, Lin Ning, Xianrun Pan, Yuchen Li, Qi Zhao, Bo Pang, Jian Huang, Kejun Deng, Yang Zhang. 2022. TCM2COVID: A Resource of Anti-COVID-19 Traditional Chinese Medicine with Effects and Mechanisms. *iMeta* e42. <https://doi.org/10.1002/imt2.42>

# Search page

The Search page, Result page and Detail page (use Xuebijing Injection as an example).

The image illustrates the user interface of the TCM2COVID database, showing the search process and the resulting detail page for Xuebijing Injection.

**Search page:** The search interface includes tabs for 'Formula', 'Nature Product', and 'Herb'. A search box contains 'Xuebijing Injection'. Below the search box, there are links for 'Formula Name in Chinese: e.g. 血必净注射液' and 'Formula Name in Pinyin: e.g. Xuebijing Injection'. Search and Reset buttons are present.

**Result page:** The search results are displayed in a table with columns for 'Formula Name in Pinyin', 'Formula Name in Chinese', and 'Virus'. The result for 'Xuebijing Injection' is shown, with the virus listed as 'SARS-CoV-2; SARS-CoV'. A 'more' link is available for each entry.

**Detail page:** The detail page for Xuebijing Injection provides comprehensive information:

- Basic information:** Formula Name in Chinese (血必净注射液), Formula Name in Pinyin (Xuebijing Injection), Dosage Form (Injection), and Herbs Contained in This Formula (红花, 赤芍, 川芎, 丹参, 当归).
- COVID Treatment Information:** Virus (SARS-CoV-2; SARS-CoV), Range of Clinical Applications (Treatment), IC50 (EC50) or dosage (11.75 mg/MI), and Improvement in Symptoms (1)The results showed that XBJ was able to protect cells from virus-induced cell death and inhibit the average size and plaque number in XBJ-treated cells in a dose-dependent manner; 2)indications for:Fever, shortne).
- References information:** Title (The study on the treatment of Xuebijing injection (XBJ) in adults with severe or critical Corona Virus Disease 2019 and the inhibitory effect of XBJ against SARS-CoV-2), PMID (32653650), Journal (Pharmacological research), and Year (2020-10-01).
- Network of herbs related to the formula:** A network diagram showing Xuebijing Injection (red circle) connected to its constituent herbs (black circles): DAN SHEN, CHUAN XIONG, CHI SHAO, and HONG HUA.

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# Webserver

1. Filling out the herb list of the queried formula in the query window.
2. Setting the threshold of the P-value (Fisher's exact test).
3. Setting the type of herb name fill in the query window.
4. The result page provides an embedded bubble chart web tool to display the results.
5. Download the bubble chart (PDF).
6. Download the result table (TXT).

### Formula Similarity Analysis

Enter herb list of your formula, you could obtain the similar formulas from TCM2COVID database for your formula (see [help](#) for details).  
Your input:

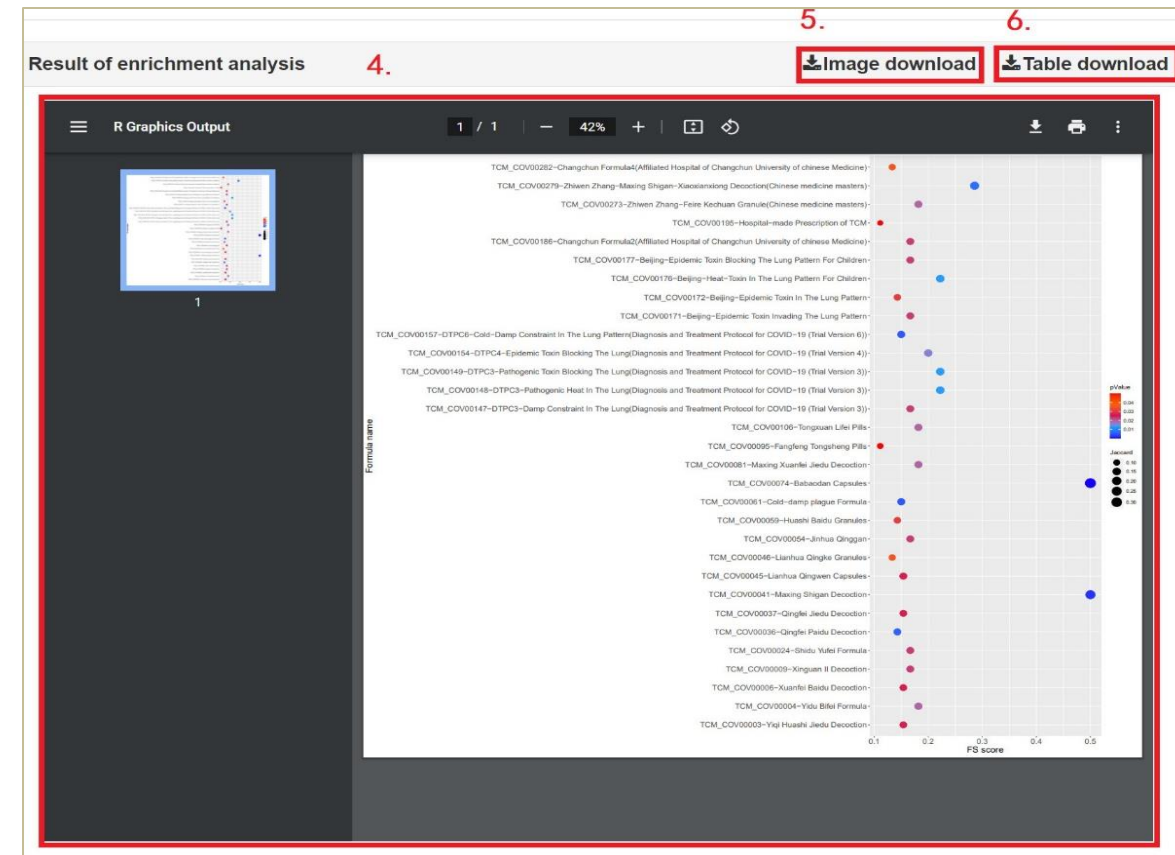
1.

2. P-Value:

3. Herb Type:

**Note**

- Users can input or paste list of herbs to perform similarity analysis in TCM2COVID database.
- For '**Herb Type**', you can use **Herb Pinyin Name, Herb Chinese Name, Herb English Name or Herb ID** (e.g. 'MA HUANG', '麻黄', 'Ephedra', 'HERB003658').
- For '**P-Value**', the threshold of the enrichment analysis, you can use specific threshold such as '**0.05**' or '**0.01**'.
- For more note about search, [click here to the Help websites](#)



# Prescription details page

1. Basic information

3. Displays the herbs contained in this prescription

2. COVID treatment information

4. The source of the prescription.

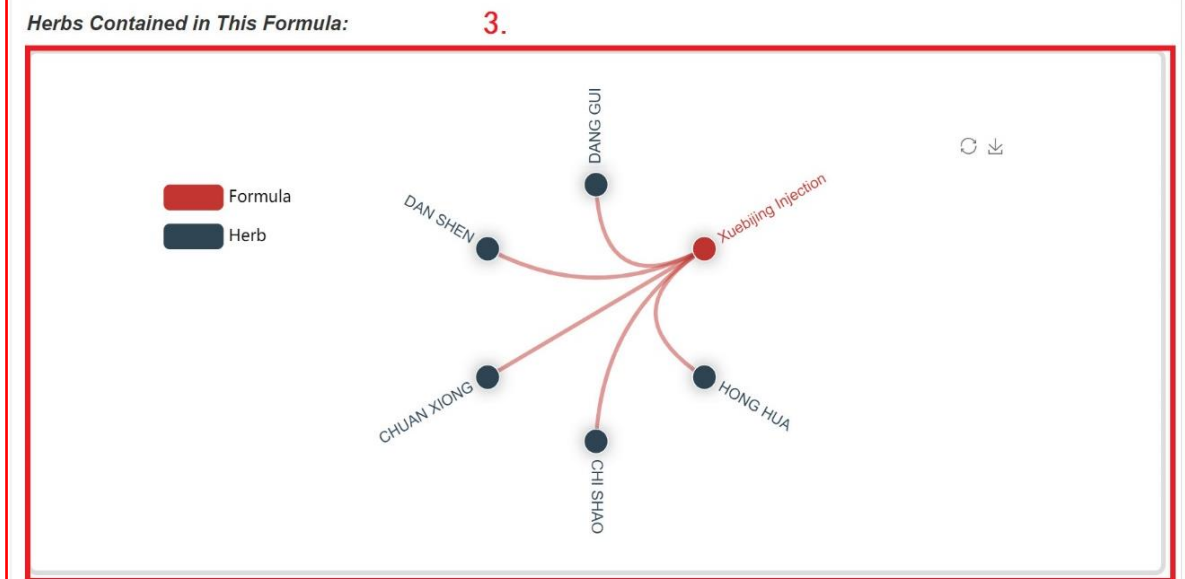
**Detail Information of formula**

**Basic Information:** 1.

Formula Name in Chinese	血必净注射液
Formula Name in Pinyin	Xuebijing Injection
Dosage Form	Injection
Herbs Contained in This Formula (Chinese)	红花, 赤芍, 川芎, 丹参, 当归
Herbs Contained in This Formula (Chinese Pinyin)	HONG HUA; CHI SHAO; CHUAN XIONG; DAN SHEN; DANG GUI

**COVID Treatment Information:** 2.

Virus	SARS-CoV-2; SARS-CoV															
Range of Clinical Applications	Treatment															
IC50 (EC50) or dosage	11.75 mg/ml															
Improvement in Symptoms	1)The results showed that XBJ was able to protect cells from virus-induced cell death and inhibit the average size and plaque number in XBJ-treated cells in a dose-dependent manner; 2)indications for:Fever, shortness of breath, heart palpitation, restlessness; 3) Results from the study indicate that XBJ injection significantly improves the primary endpoint of the pneumonia severity index as well as brings about a significant improvement in the secondary clinical outcomes of mortality, reduces the duration of mechanical ventilation, and shortens the duration of ICU stay; 3)there were significant improvements in IL-6 levels and body temperature in the observation group as compared with the control group. Particularly in severe patients, the reduction in body temperature in the observation group was greater than that in the control group (P<0.05).															
Potential Mechanism	1)LT4H, 12-LOX, IL2, cPLA2, IL6, RELA, TNF, PTGS2, IL10, NOS2α, CASP3, MAPK1; 2)XBJ inhibited the release of TNF-α, IL-6, MIP-1β, RANTES, and IP-10 induced by SARS-COV-2 in Huh-7 cells; 3)XBJ treatment showed that the expression of TNF-α, IP-10, macrophage inflammatory protein-1β (MIP-1β) and RANTES protein was inhibited during day 7–8 of treatment.															
China Clinical Trial Registry Information	ChiCTR2000030388; ChiCTR2000029381															
	<table border="1"> <thead> <tr> <th>China Clinical Trial Registry number</th> <th>No. of subject</th> <th>Case</th> <th>Control</th> <th>Trial</th> </tr> </thead> <tbody> <tr> <td>ChiCTR2000030388</td> <td>60</td> <td>30</td> <td>30</td> <td>single-centre</td> </tr> <tr> <td>ChiCTR2000029381</td> <td>284</td> <td>192</td> <td>192</td> <td>multi-centre</td> </tr> </tbody> </table>	China Clinical Trial Registry number	No. of subject	Case	Control	Trial	ChiCTR2000030388	60	30	30	single-centre	ChiCTR2000029381	284	192	192	multi-centre
China Clinical Trial Registry number	No. of subject	Case	Control	Trial												
ChiCTR2000030388	60	30	30	single-centre												
ChiCTR2000029381	284	192	192	multi-centre												
In silico Method	No															



**Source:** 4.

Title:	Chinese herbal medicine: Fighting SARS-CoV-2 infection on all fronts.
PMID:	33485973
Journal:	Journal of ethnopharmacology
Year:	2021-04-24
Title:	The study on the treatment of Xuebijing injection (XBJ) in adults with severe or critical Corona Virus Disease 2019 and the inhibitory effect of XBJ against SARS-CoV-2.
PMID:	32653650
Journal:	Pharmacological research
Year:	2020-10-01

# Herbal details page

1. Basic information

2. Displays prescriptions containing this herb

3. Related ingredients of herbs.

Detail Information of herb	
<b>Basic Information:</b>	
Herb Name in Chinese	连翘
Herb Name in Pinyin	LIAN QIAO
Herb Name in English	Weeping Forsythia Capsule
Properties	Minor cold; Bitter
Meridians	Heart; Gallbladder
UsePart	dried fruit
Indication	Influenza in early stage, common cold in early stage, wind-heat common cold, encephalitis, hepatitis, tuberculosis, warm disease, heat strangury with inhibited pain, welling abscess, welling abscess and flat abscess, t oxin swelling, scrofula, goiter and tuberculosis, throat impediment.
Herb Name in Latin	<i>Fructus Forsythiae</i>
Herb ID	<a href="#">HERB003361</a>

Formula included this Herb: 2.

Related Ingredients: 3.

Ingredient name	Ingredient formula	more
12-Oxoarundoin	C31H50O2	more
(1R,3aR,4R,6aS)-1,4-bis(4-hydroxy-3-methoxyphenyl)-3,3a,4,6-tetrahydro-1H-furo[3,4-c]furan-6a-ol	/	more
(1S,5S)-1-isopropyl-4-methylenecyclo[3.1.0]hexane	C10H16	more
(1S,6R)-3,7,7-trimethylbicyclo[4.1.0]hept-3-ene-2,5-dione	C10H12O2	more
[(1S)-endo-]-Borneol	C12H20O2	more
20-dio-3-acetate	/	more
20 (s) -dammar-24-ene-3beta	/	more
20(S)-dammar-24-ene-3beta,20-diol-3-acetate	/	more
2-(3,4-dihydroxyphenyl)-5,7-dihydroxy-3-[(2R,3R,4R,5R,6S)-3,4,5-trihydroxy-6-methyl-tetrahydropyran-2-yl]oxy-chromone	C21H20O11	more
2,3-dihydroxymethyl-4-(3',4'-dimethoxyphenyl)-gamma-butyrolactone	C14H18O6	more

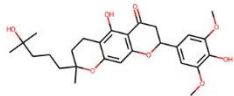
Showing 1 to 10 of 239 entries

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# Natural products details page

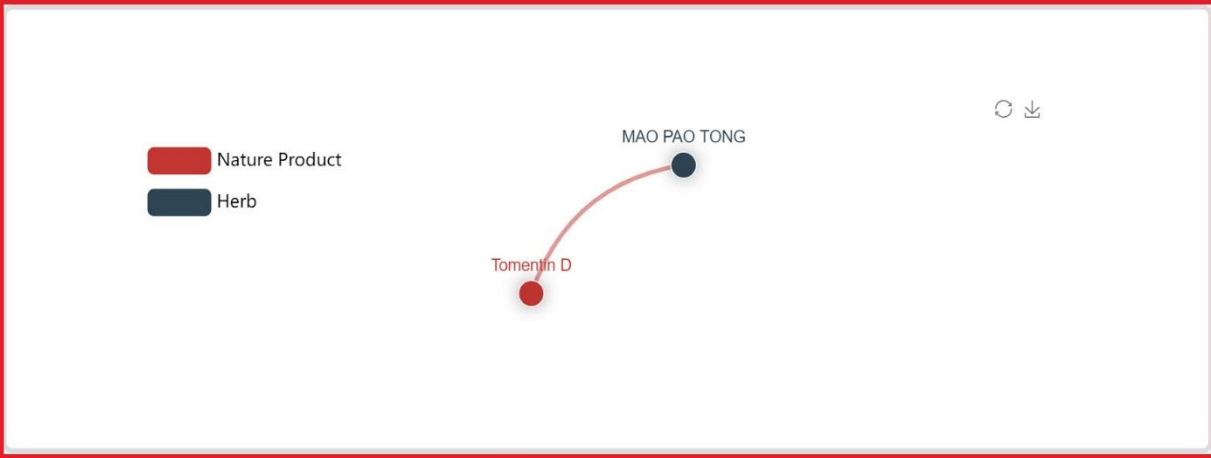
## 1. Basic information

## 3. Herbs related with this nature product.

Basic Information: 1.	
Nature Product Name in English	Tomentin D
2D-Structure	
Molecular Formula	C <sub>27</sub> H <sub>34</sub> O <sub>8</sub>
SMILES	<chem>CC1(CCC2=C(C3=C(C=C2O1)OC(CC3=O)C4=CC(=C(C(=C4)OC)O)OC)O)CCCC(C)(C)O</chem>
PubChem ID	<a href="#">71659766</a>
Herb Containing this Nature Product in Pinyin	<a href="#">MAO PAO TONG</a>
Herb Containing this Nature Product in English	<a href="#">Paulownia tomentosa fruits</a>
COVID Treatment Information of Nature Product: 2.	
Virus	SARS-CoV
Tissue/Cell line/Body fluid	E. coli
Effection and Dosage	1)E. coli, 5.0–12.5μmol/L, Inhibit PLpro activity
In silico method	No

## 2. COVID treatment information

## 4. Source of natural products.

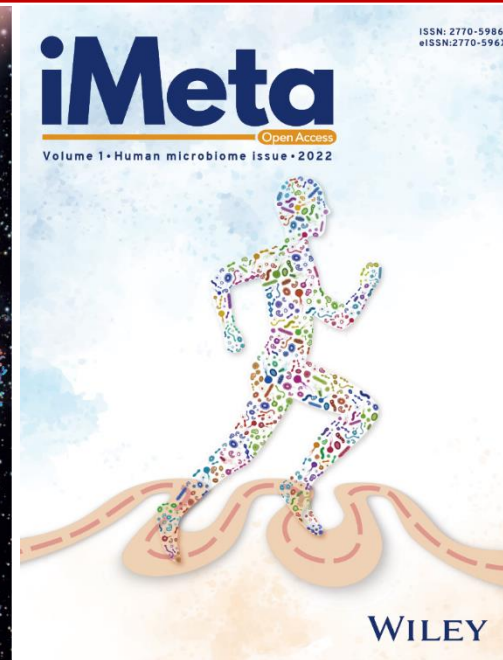
Herbs Related with this Nature Product: 3.	
	
Source: 4.	
Title:	Geranylated flavonoids displaying SARS-CoV papain-like protease inhibition from the fruits of Paulownia tomentosa.
PMID:	<a href="#">23623680</a>
Journal:	Bioorganic & medicinal chemistry
Year:	2013-06-01

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# Summary

In summary, TCM2COVID documents over 280 TCM formulas (including over 300 herbs) with detailed clinical evidence and therapeutic mechanism information, records over 80 NPs with detailed potential therapeutic mechanisms.

It provides a user-friendly and practical platform for documenting, querying, and browsing anti-COVID TCM treatments and will help in the development and elucidation of the mechanisms of action of new anti-COVID TCM therapies to support the fight against the COVID-19 epidemic.



**"iMeta"** is an open access Wiley partner journal and launched by scientists of the Chinese Academy of Sciences. iMeta aims to promote metagenomics, microbiome and bioinformatics development by publishing original researches, methods or protocols, and reviews. The goal is to publish highly quality papers (Top 10%, IF > 15) targeting broad audience. Unique features including video submission, reproducible analysis, figure polishing, APC waiver, and promotion by social media with 500,000 followers. The first issue released in March 2022.

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