Andrographolide and its effect on biological activities

Anu Gamage,
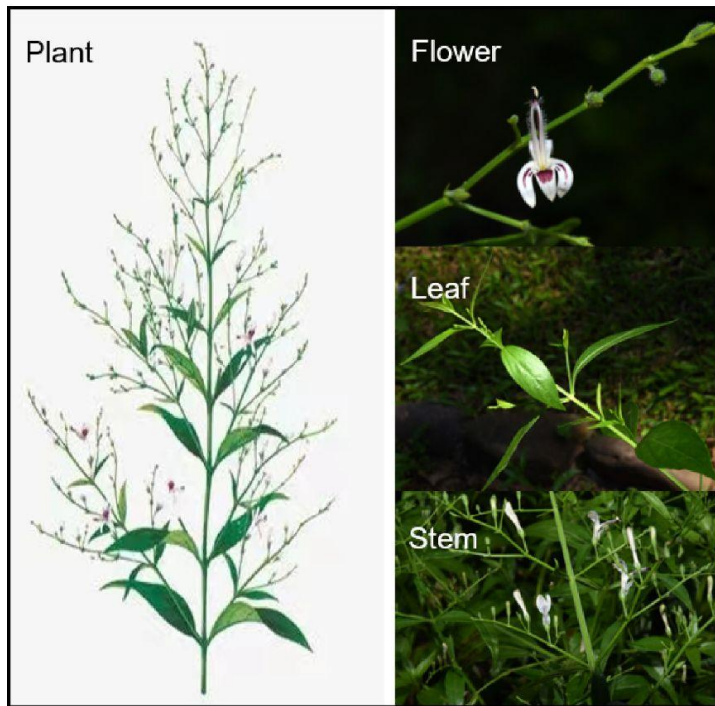Research Scientist,
Global-Chemistry Inc
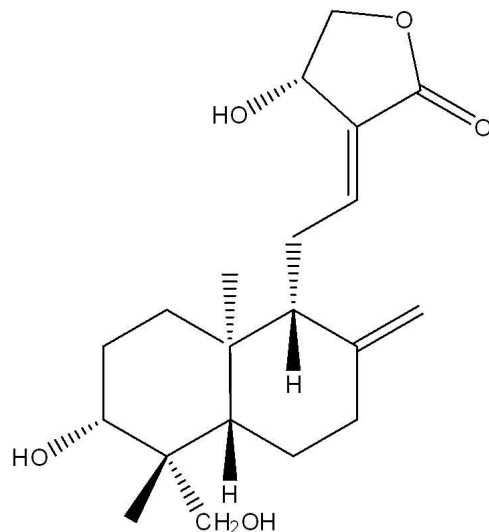
Andrographis paniculata, belonging to acanthaceae family, has been widely used in China, India and Southeast Asia

"King of Bitters"

Plant

Flower

Leaf

Stem

Andrographis paniculata

Major producing areas

Guangxi Province

Guangdong Province

Sub-production areas

Fujian Province

Jiangxi Province

Sichuan Province

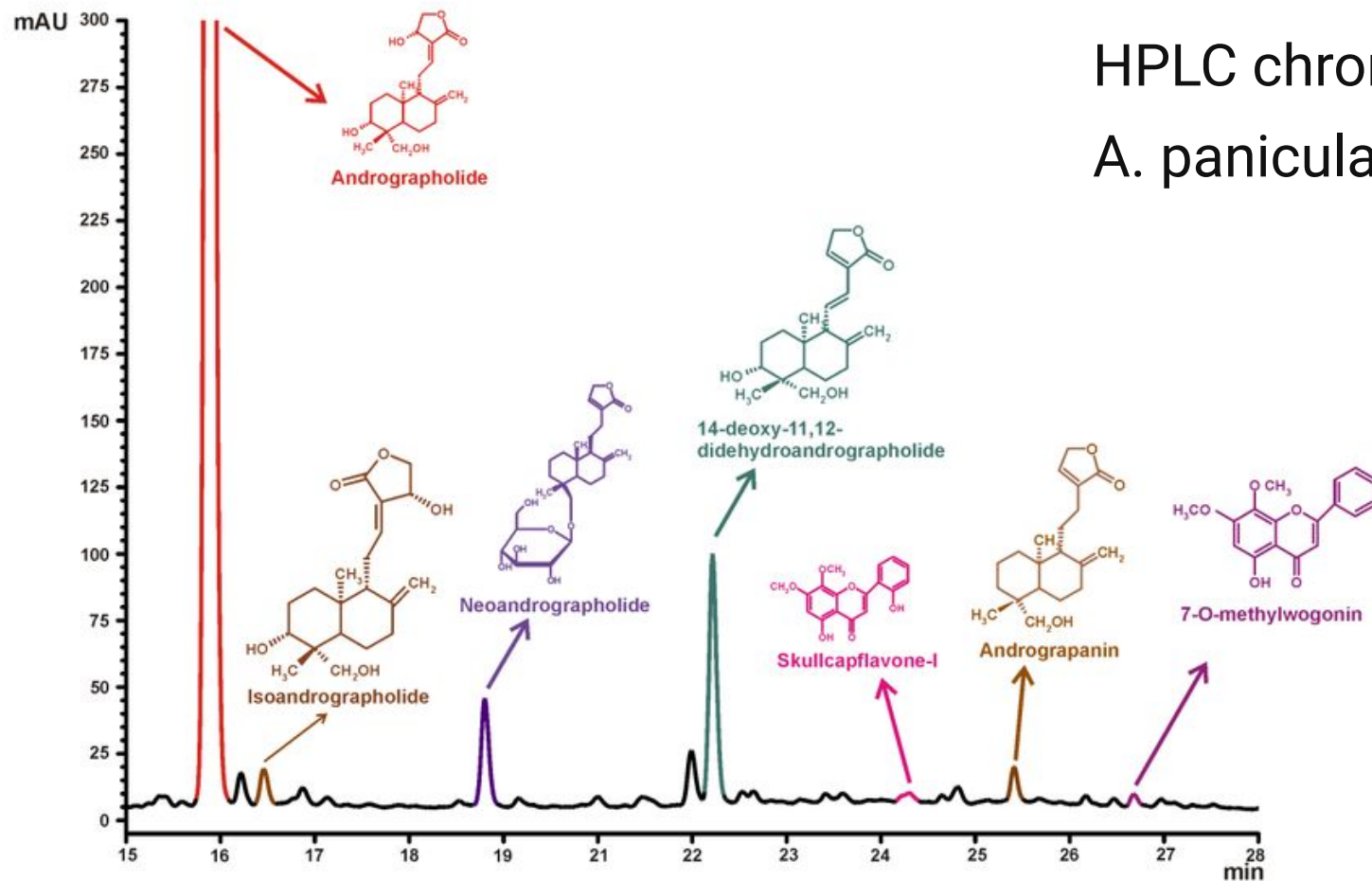Sporadic producing areas
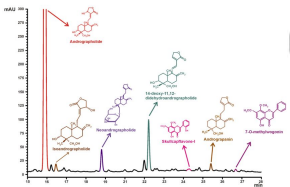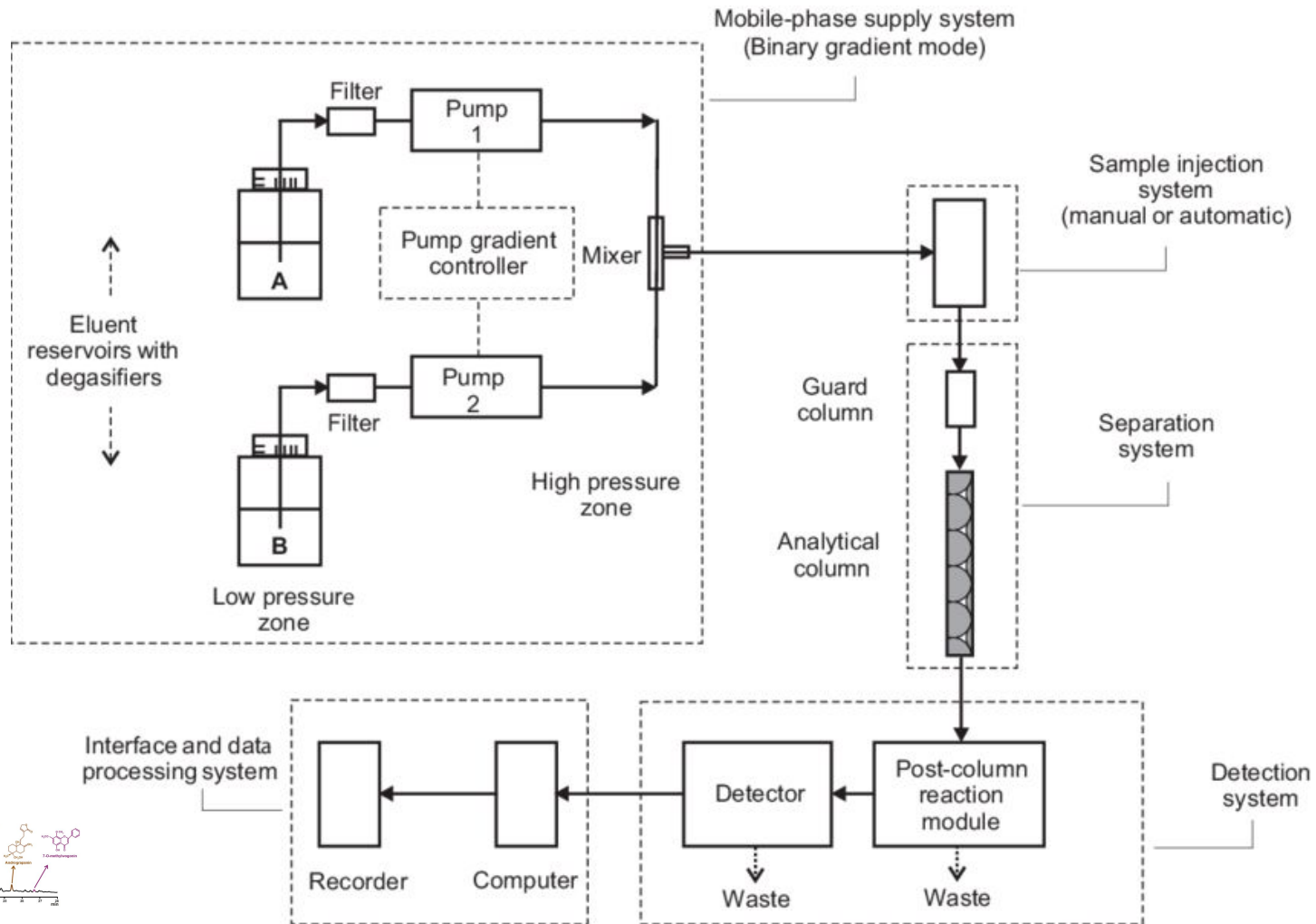
Anhui Province

Medicinal plant

Herbal medicine

穿心莲内酯胶囊
Chuanxinlian Neizhi Capsules

Medicinal product

Chemical Characterization

HPLC chromatogram of A. paniculata extract

Mobile-phase supply system (Binary gradient mode)

Filter

Pump 1

Pump gradient controller

Mixer

Eluent reservoirs with degasifiers

A

High pressure zone

Filter

Pump 2

B

Low pressure zone

Sample injection system (manual or automatic)

Guard column

Separation system

Analytical column

Interface and data processing system

Detector

Post-column reaction module

Detection system

Recorder

Computer

Waste

Waste

HPLC : https://youtu.be/MLoitPJQH3g?si=yxqpNORM7w4gjQQs

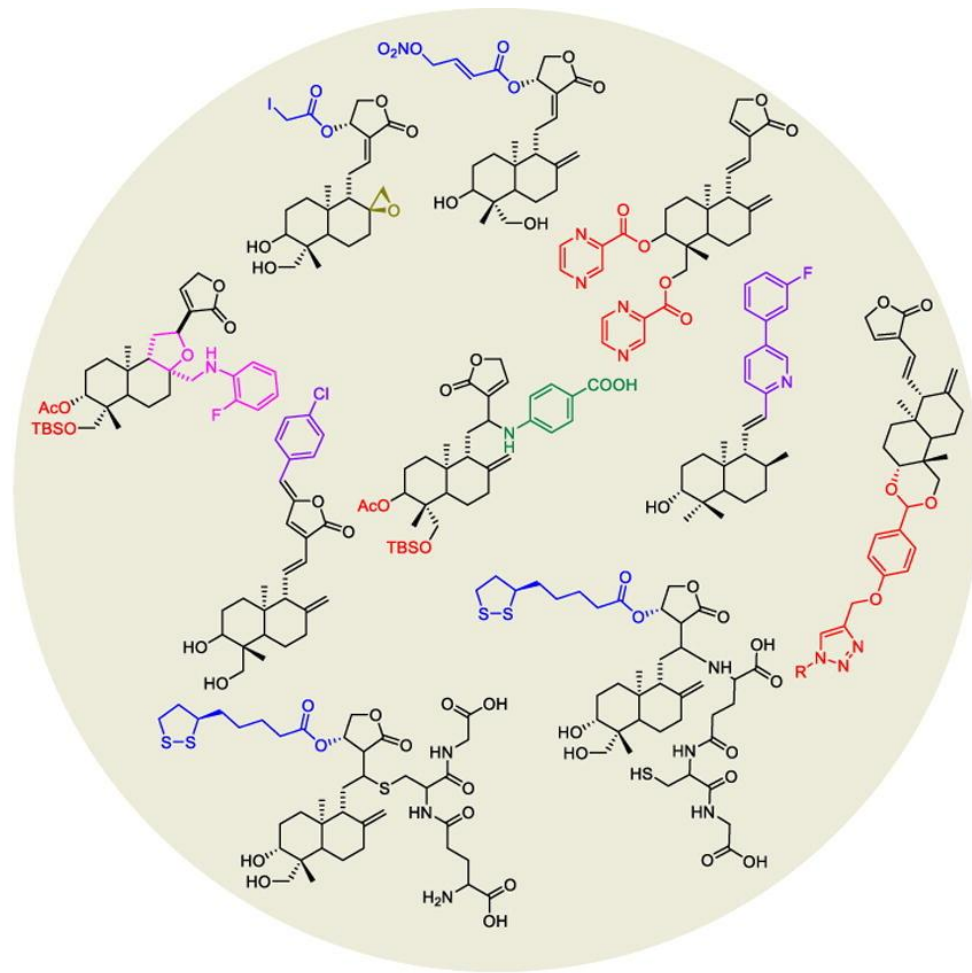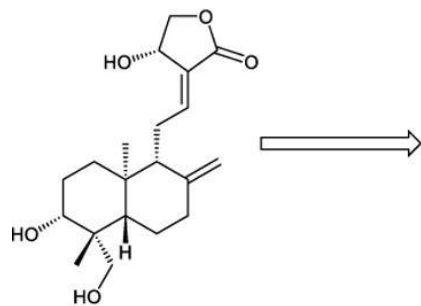*Biological Activities*

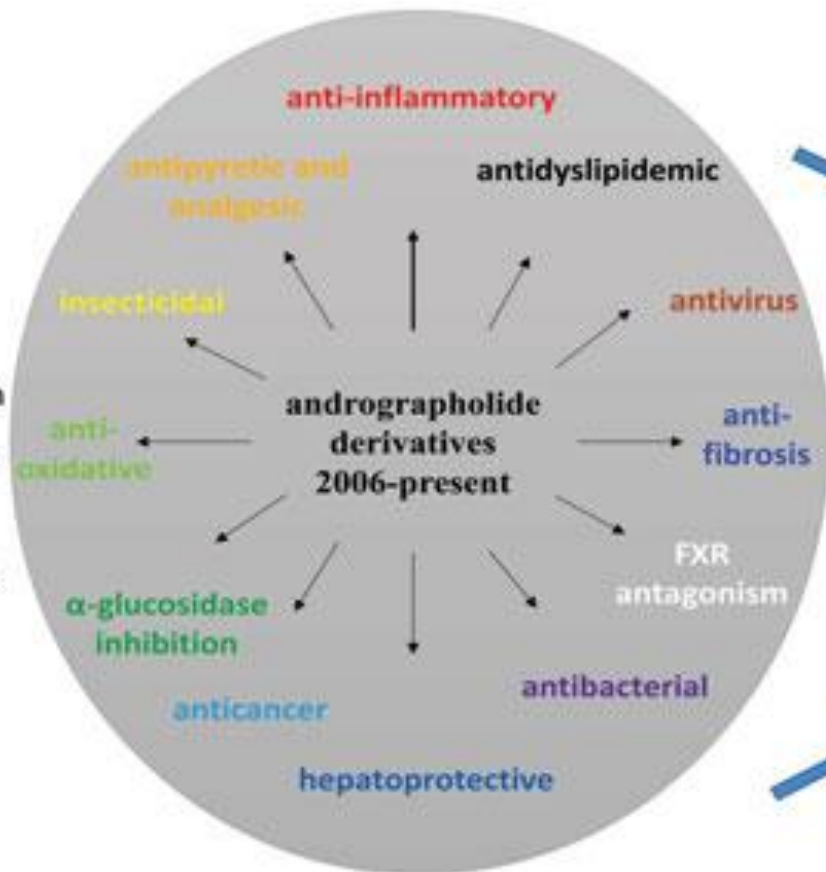Andrographolide: A **natural product template** for the generation of structurally and biologically diverse diterpenes

Bioactive Andrographolide Derivatives

Structural modification and biological activity of Andrographolide Derivative.

anti-neuroinflammatory; neuroprotective

pharmacological effects : ↓ NO; iNOS; TNF-α; IL-6; cell death

anti-neuroinflammatory; neuroprotective

Alzheimer's disease

AD-targets: CHRM1, CHRM2, CHRM3, CHRM4, PTGS1, PTGS2 and MAP2K1

neurite outgrowth promoting

AD-targets: CYP19A1, ESR1, HDAC2 and MAPT

andrographolide

modification

3

12

10
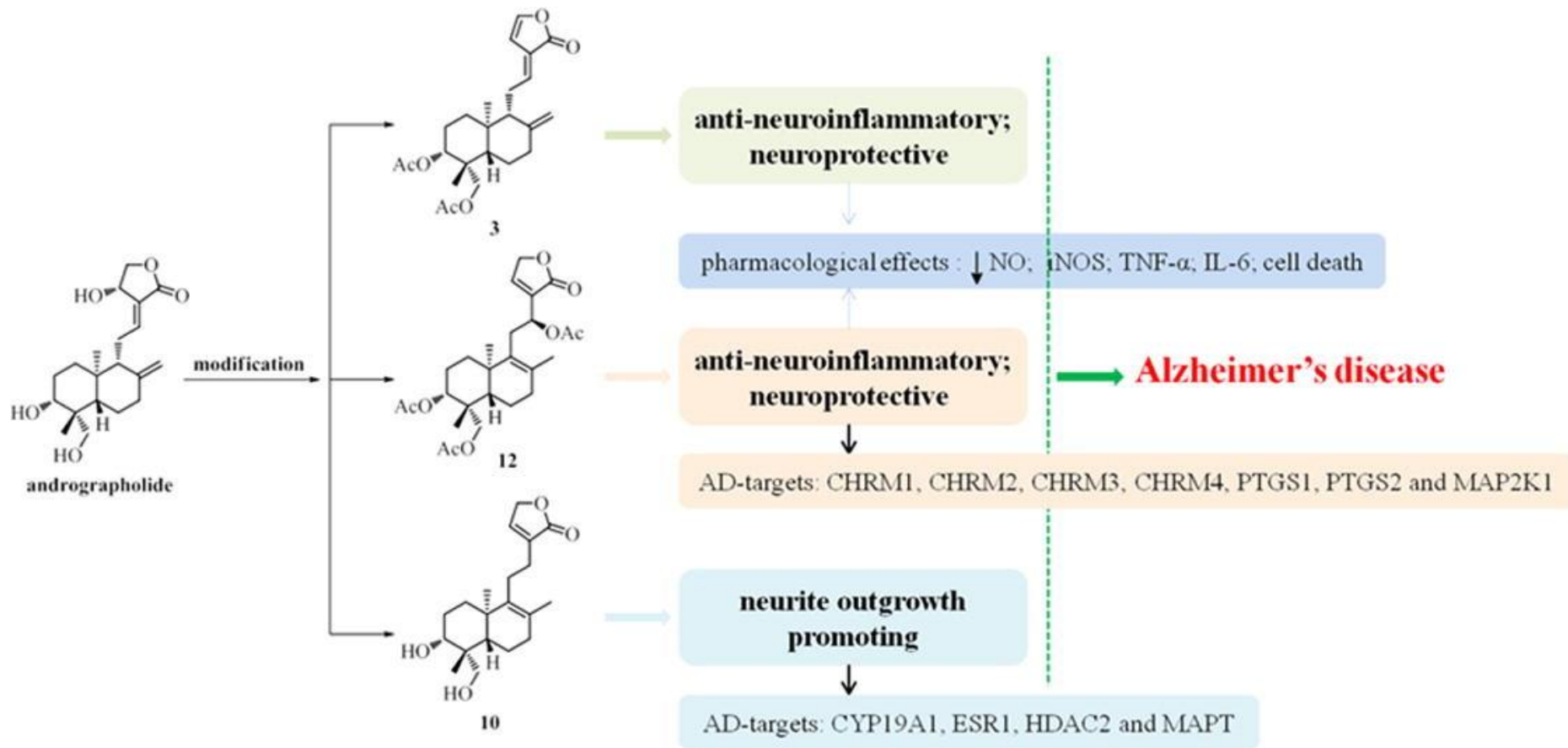
Discovery of C-12 dithiocarbamate andrographolide analogues as inhibitors of SARS-CoV-2 main protease: *In vitro* and *in silico* studies

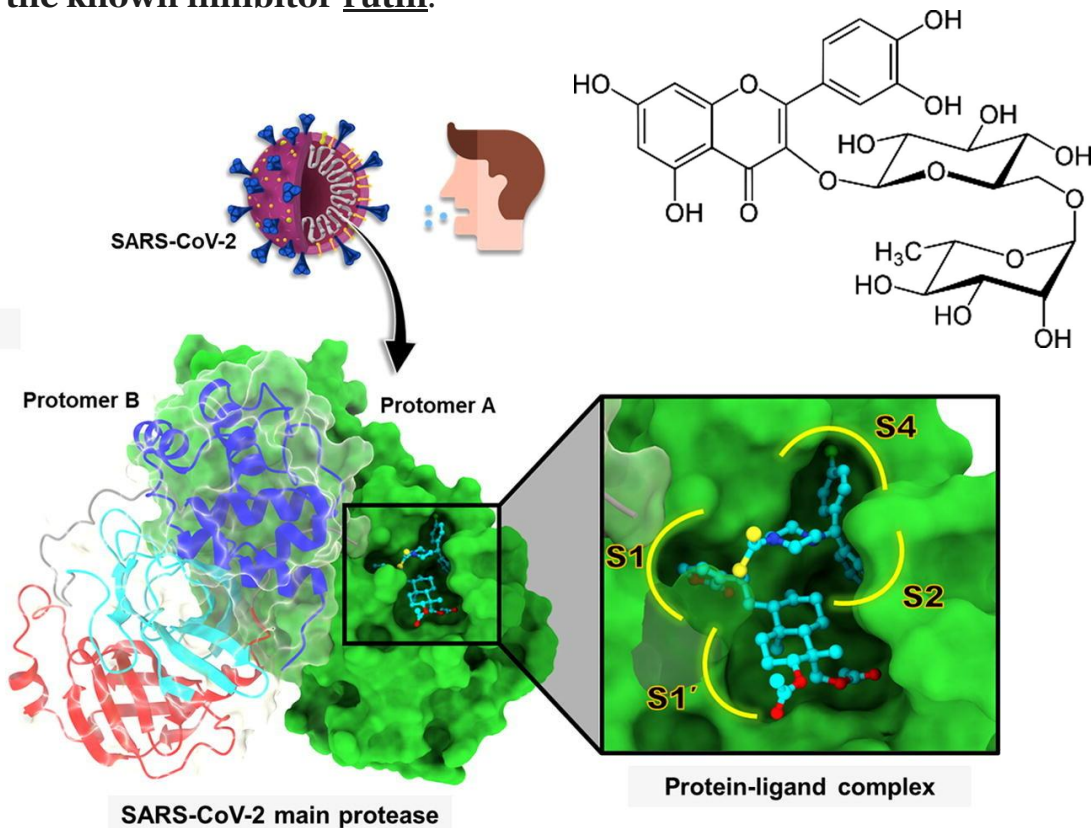Bodee Nutho [a] ✉, Patcharin Wilasluck [b c], Peerapon Deetanya [b c], Kittikhun Wangkanont [b c], Patcharee Arsakhant [d e], Rungnapha Saeeng [d e], Thanyada Rungrotmongkol [f g]
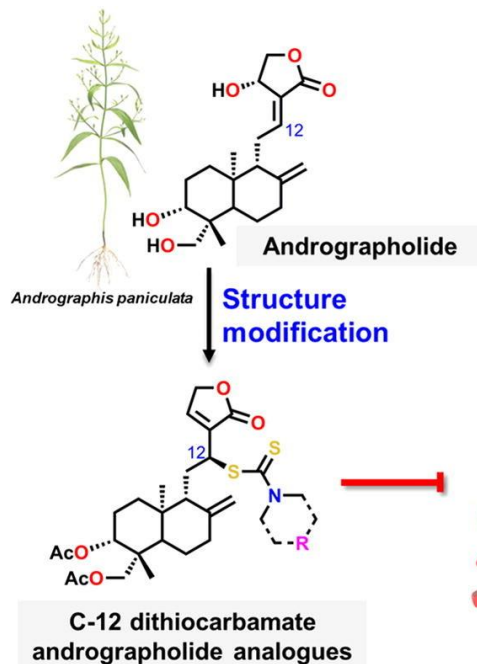
Twenty-one andrographolide analogues (3a-u), including their parent compound (1) and precursor (2), were tested *in vitro* inhibitory activity against SARS-CoV-2 M$_{pro}$. The results revealed that compounds 3k, 3l, 3m and 3t showed promising inhibitory activity toward SARS-CoV-2 M$_{pro}$ **better than the known inhibitor** <u>rutin</u>.

Andrographolide

Andrographis paniculata

Structure modification

C-12 dithiocarbamate andrographolide analogues

SARS-CoV-2

Protomer B

Protomer A

SARS-CoV-2 main protease

S4

S1

S2

S1'

Protein-ligand complex

References :

- https://www.sciencedirect.com/topics/pharmacology-toxicology-and-pharmaceutical-science/rutin
- https://www.sciencedirect.com/science/article/abs/pii/S0223523419304313
- https://www.sciencedirect.com/science/article/pii/S2001037022002094
- https://www.sciencedirect.com/science/article/abs/pii/S0045206819312994
- https://www.sciencedirect.com/science/article/abs/pii/S0223523421005596
- https://www.sciencedirect.com/science/article/abs/pii/S0968089619300422
- https://www.researchgate.net/figure/Schematic-diagram-of-a-typical-HPLC-or-HPIC-set-up-with-a-binary-gradient-mobile-phase_fig1_227934976