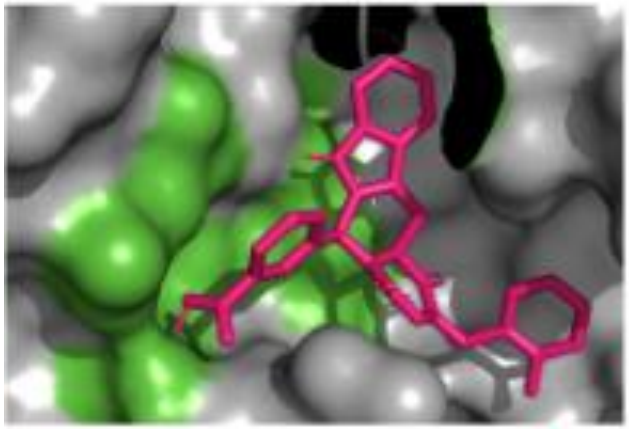
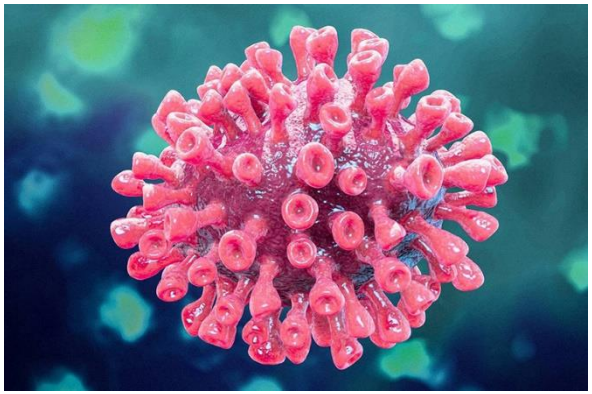
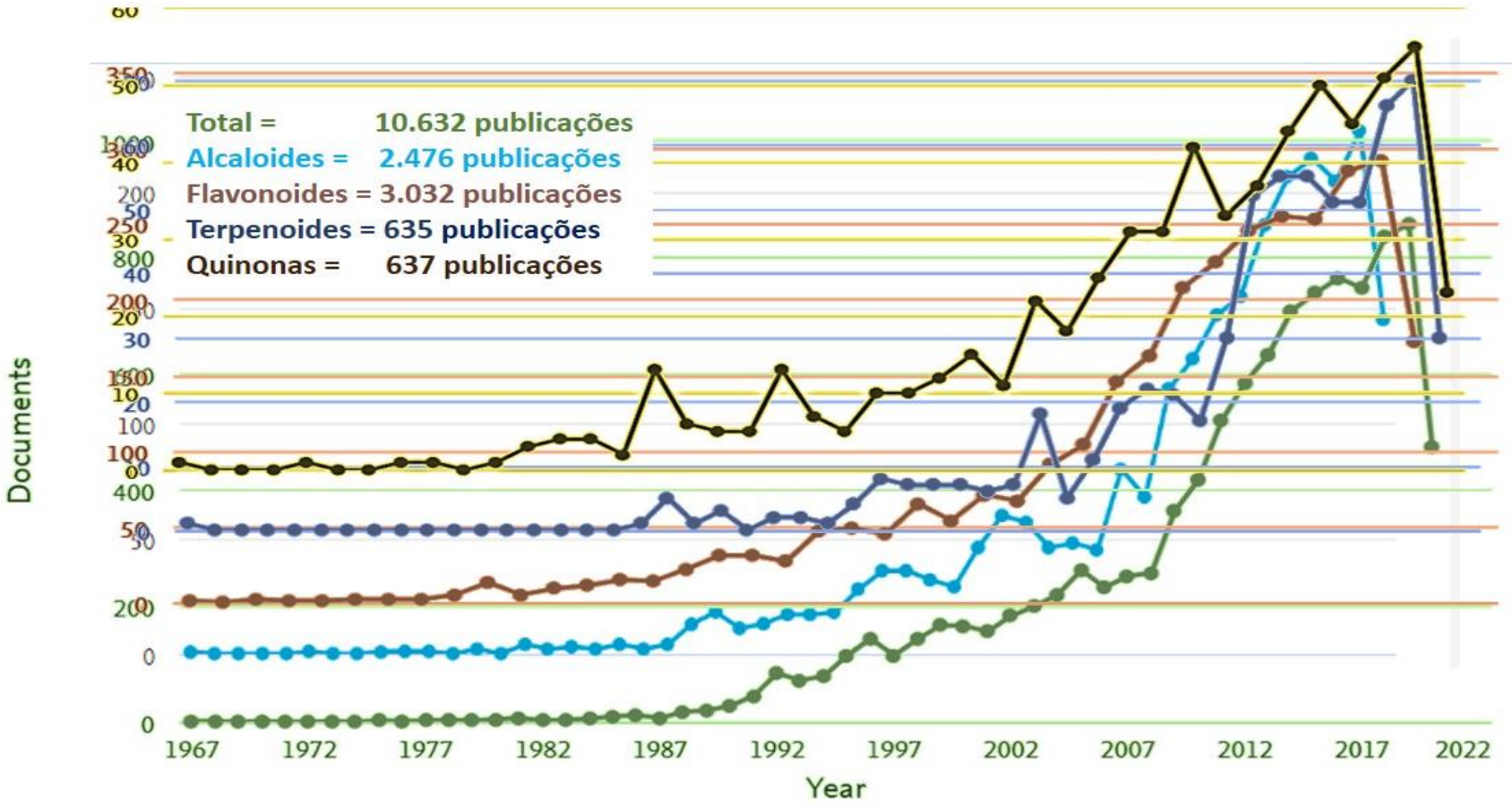
Biomoléculas Promissoras no combate a COVID-19





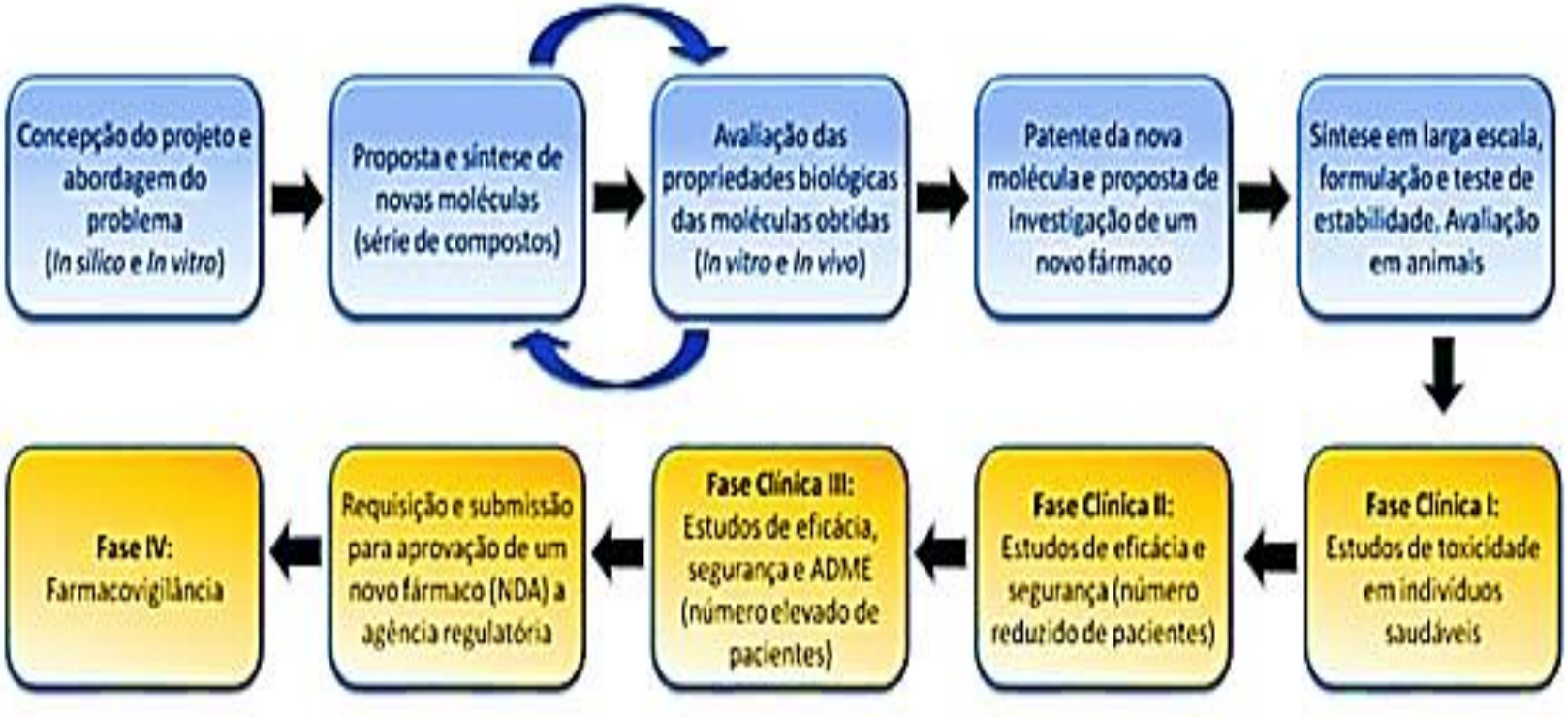


Biomoléculas Promissoras no combate a COVID-19
Evolução de publicações



Fonte: www.scopus.com, acesso 12/06/2020; “Antiviral” e “Natural products”

Etapas do processo de desenvolvimento de fármacos



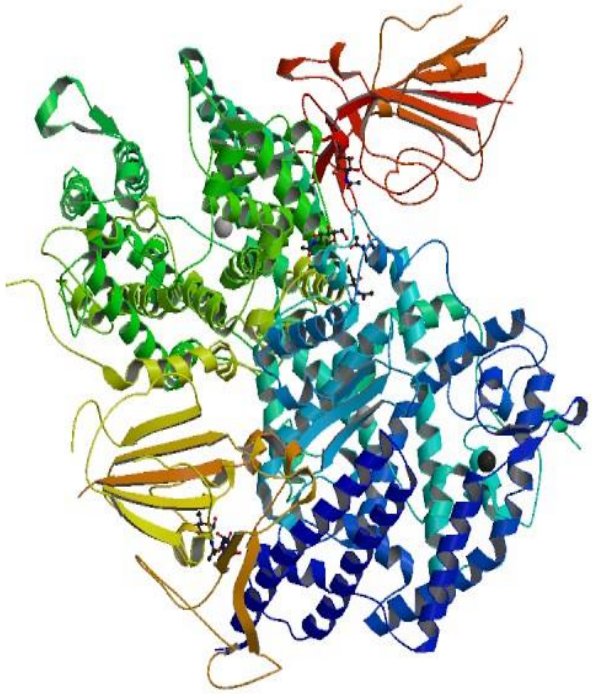
Guido, R.V.C.; Andricopulo, A.D.; Oliva, G.Estud. av. vol.24 no.70 São Paulo 2010
https://doi.org/10.1590/S0103-40142010000300006

Características moleculares de candidatos a fármacos

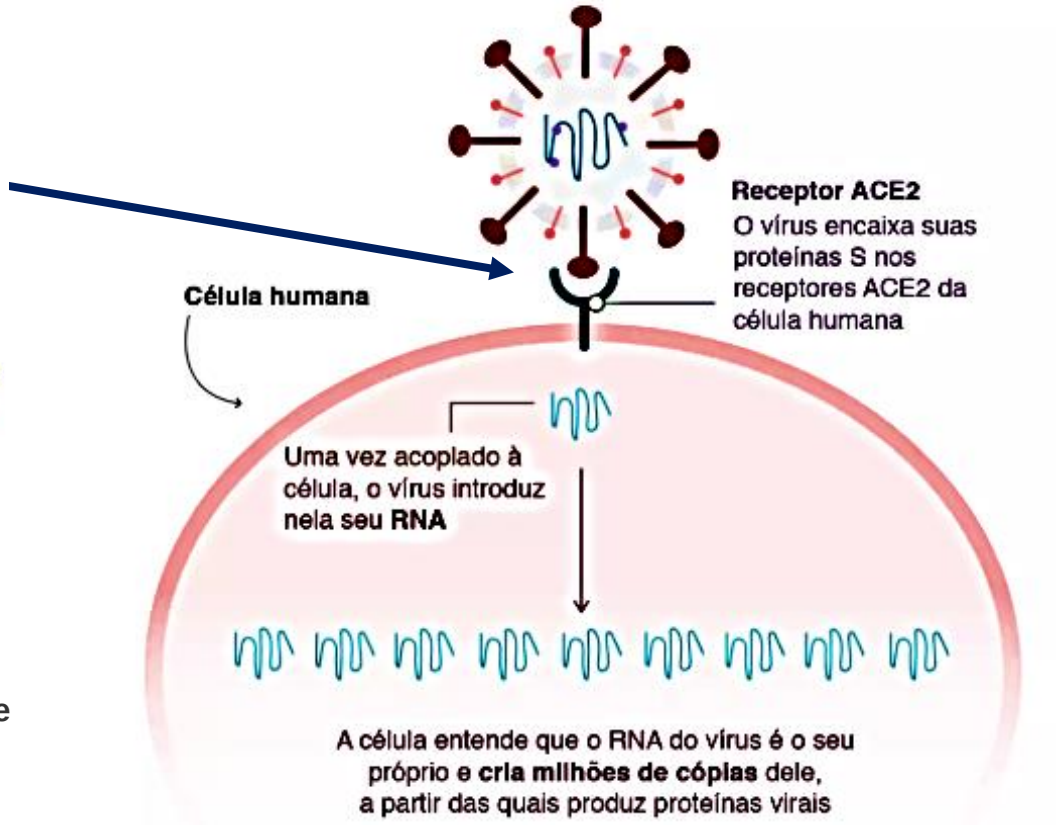
Alta biodisponibilidade oral

Massa molar
Log P (lipofilicidade)
Número de doadores de ligação hidrogênio
Número de receptores de ligação hidrogênio
Log S (solubilidade)
TPSA(Å2)

Na busca de compostos bioativos promissores ao combate de CoVID-19 - Inibidores da enzima conversora da Angiotensina II (ACE2)

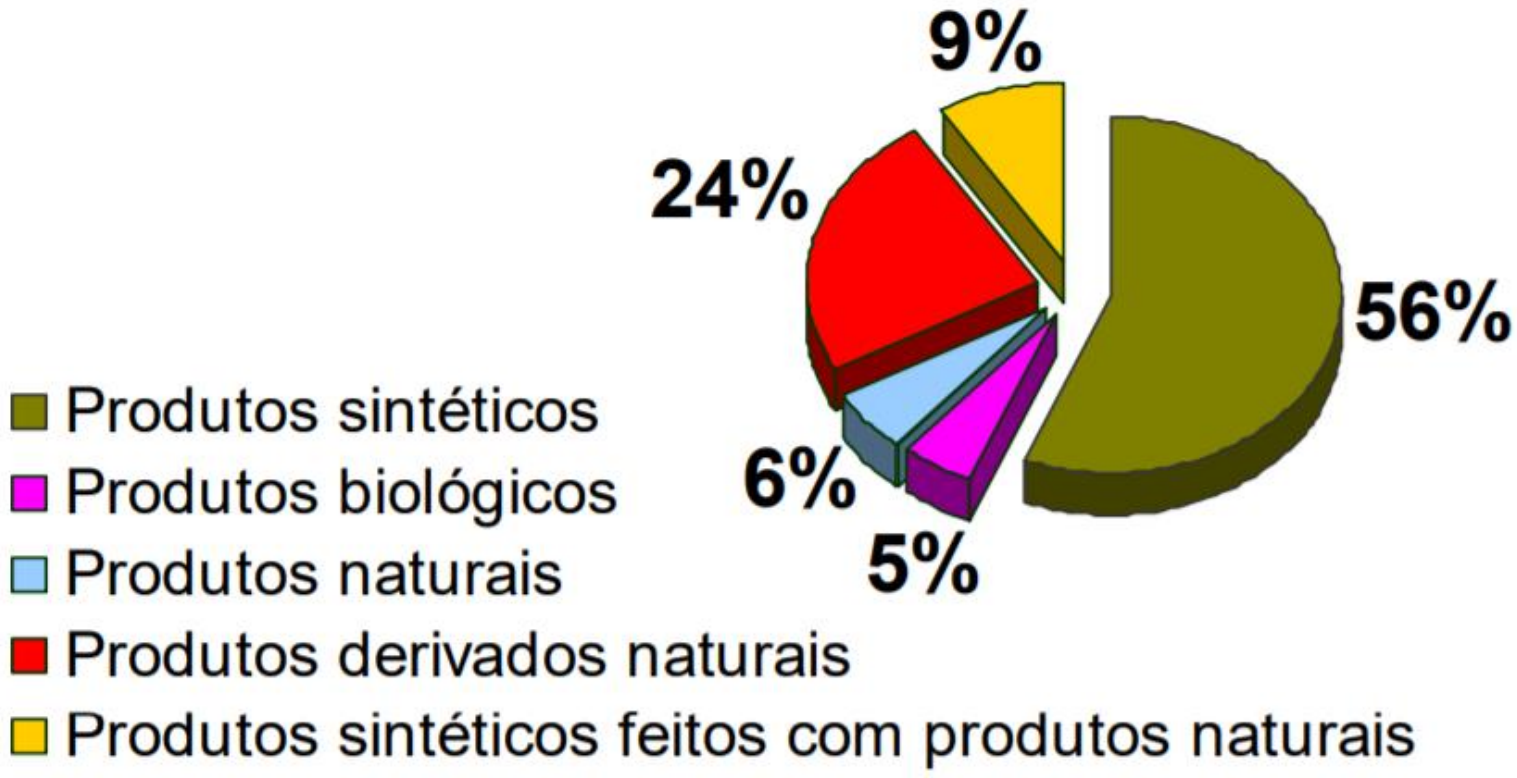


Estrutura cristalina da proteina spike do SARS coronavirus complexada com receptor ACE2
DOI: 10.2210/pdb3D0G/pdb



The Lancet, 31-JAN-2020

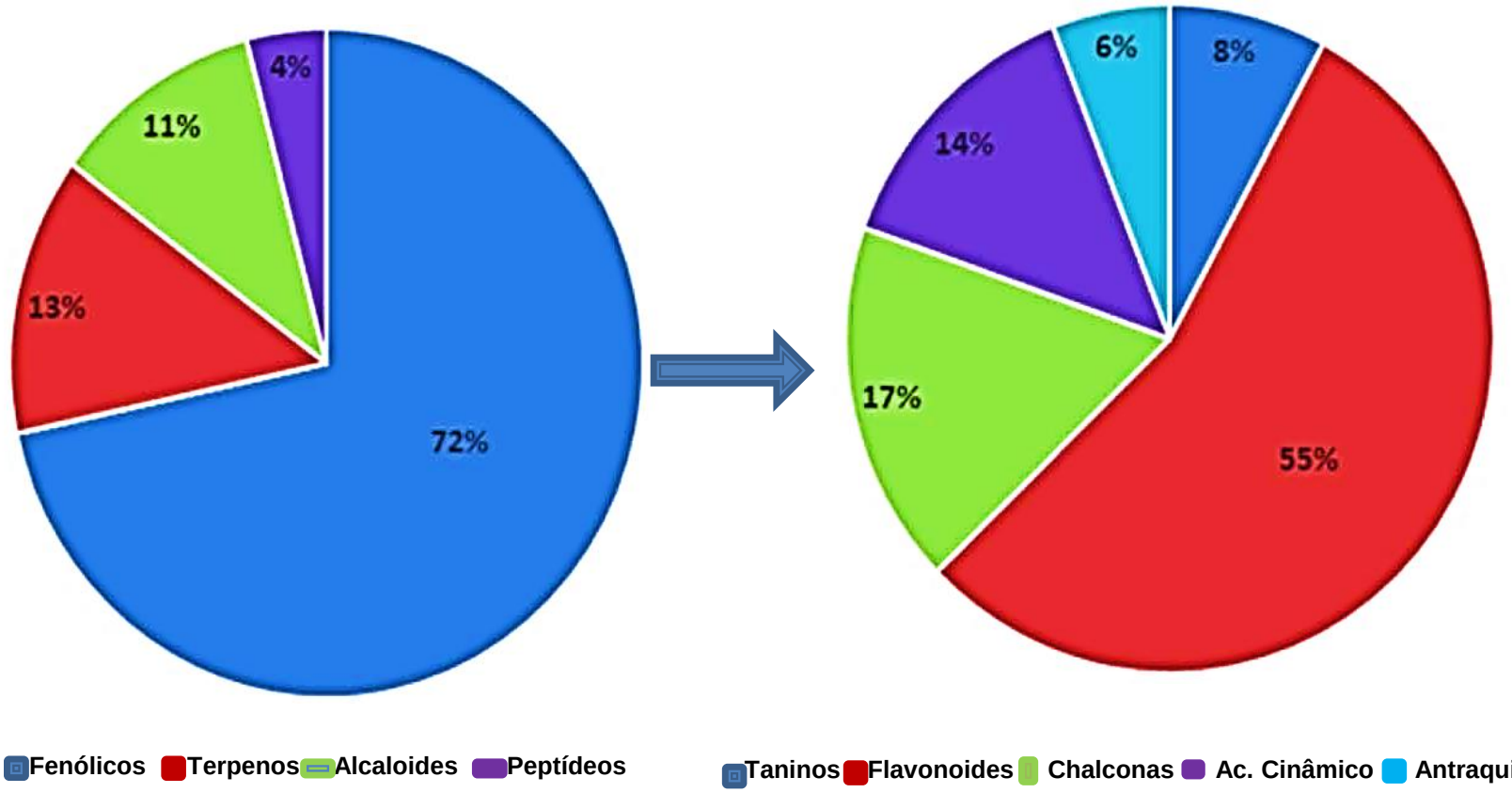
Origem dos Fármacos



44% dos Fármacos tem sua origem em Produtos Naturais

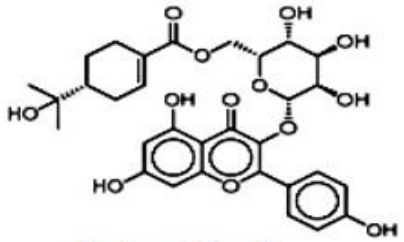
Hostettmann, K., The Search for New Drugs from Higher Plants, International Journal for Chemistry 61(6):322-326, 2007.DOI: 10.2533/chimia.2007.322

Classes de Biomoléculas Promissoras no combate a COVID-19

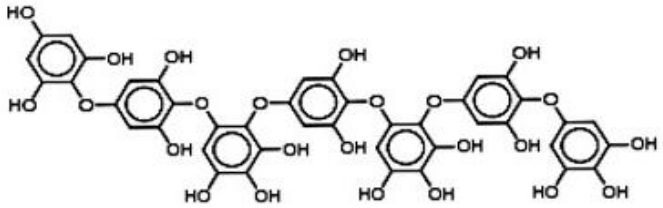


Sayed et al. *RSC Adv.*, **2020**, 10, **19790**

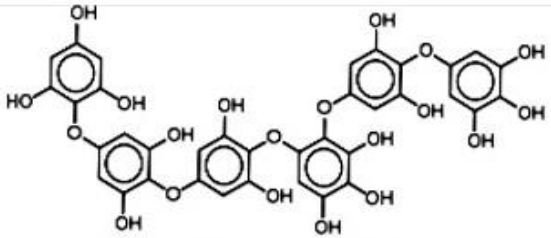
Compostos bioativos marinhos potenciais candidatos ao tratamento da SARS-CoV-2



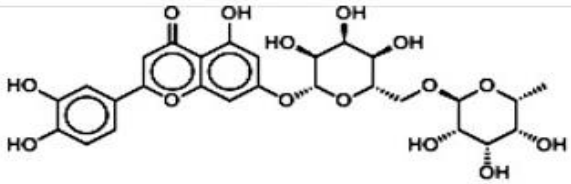
Resinosideo B



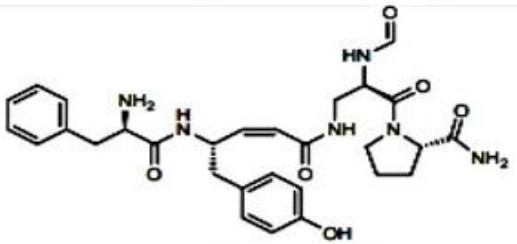
Heptafualol A



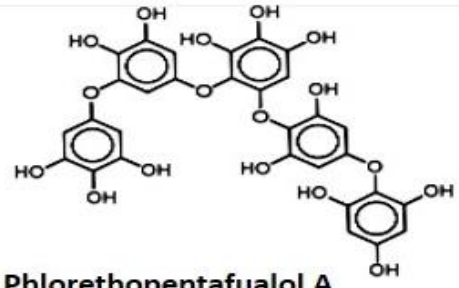
Phlorethopentafualol B



Luteolina 7-rutinosideo



Pseudotheonamide D



Phlorethopentafualol A



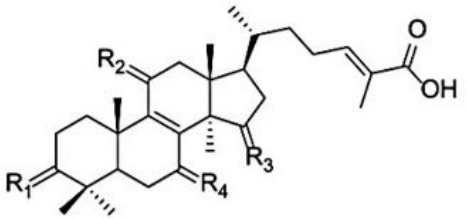
Sargassum spinuligerum **(alga marrom)**

Gentile et al. Mar. Drugs 2020, 18, 225; doi:10.3390/md18040225.

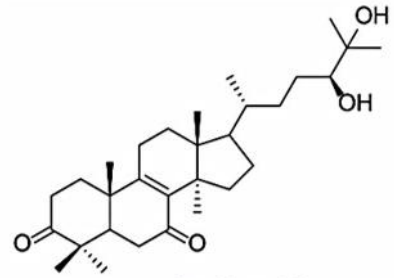
Compostos bioativos fúngicos potenciais candidatos ao tratamento de SARS-CoV-2



Ganoderma lucidum



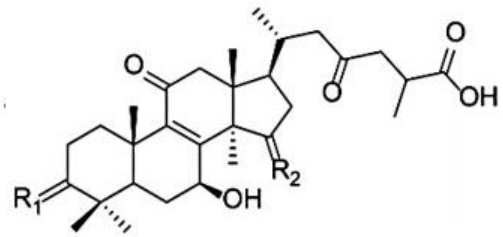
Ácido β-Ganodérico: R_1=OH; R_2=O; R_3=O; R_4=OH, H
Ganoderma lucidum



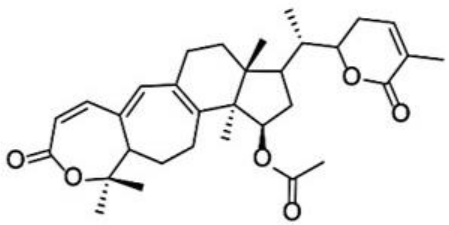
Lucidumol B
Ganoderma lucidum



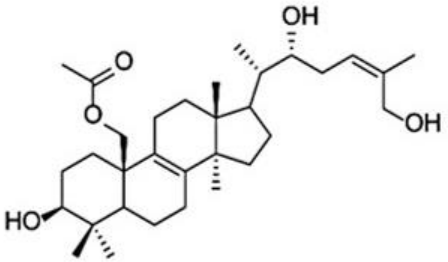
Ganoderma colossum



Ácido Ganodérico A: R_1=O; R_2=OH, H
Ganoderma lucidum



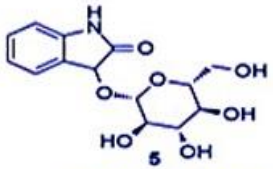
Colossolactona E
Ganoderma colossum



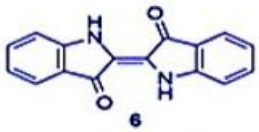
Colossolactona A
Ganoderma colossum

Suwannarach et al. *Molecules* **2020**, *25*(8), 1800, **https://doi.org/10.3390/molecules25081800**

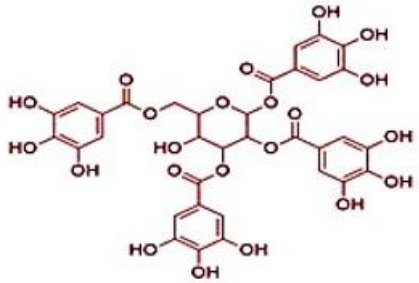
Biomoléculas com ação inibidora contra SARS-CoV



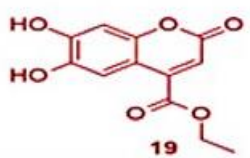
5
Indican IC_{50} 33.1 μM



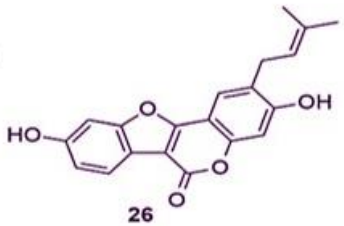
6
Indigo IC_{50} 37.3 μM



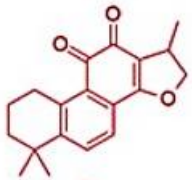
1
Tetra-O-galloyl-d-glucose IC_{50} 4.5 μM



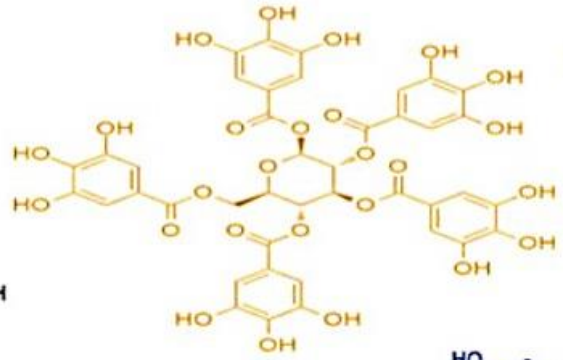
19
Esculetin-4-carboxylic acid ethyl ester
IC_{50} 46 μM



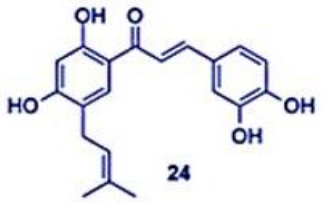
26
Psoralidin IC_{50} 4.2 μM



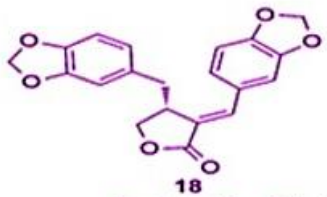
21
Tanshinone derivative IC_{50} 0.8 μM



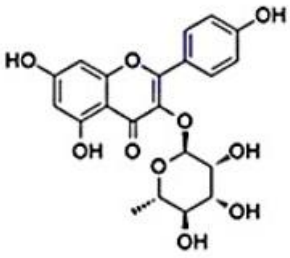
8
Tannic acid IC_{50} 3 μM



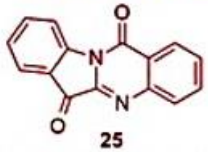
24
Chalcone derivative
Mpro IC_{50} 27.9 μM,
PLpro IC_{50} 112.9 μM



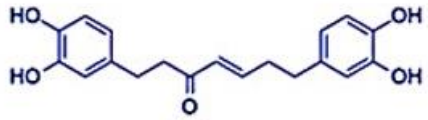
18
Savinin IC_{50} 9.1 μM



30
Afzelin



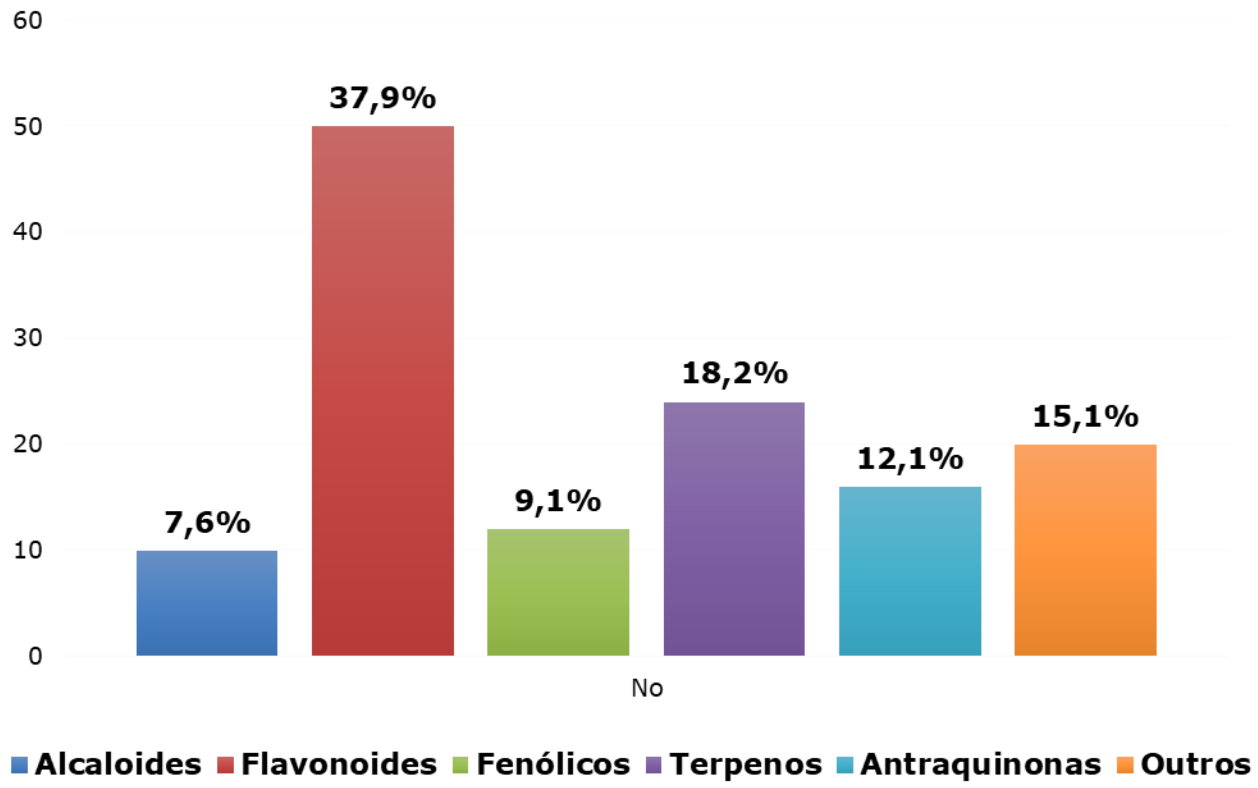
25
Tryptanthrin IC_{50} 1.52 μM



22
Hirsutenone IC_{50} 4.1 μM

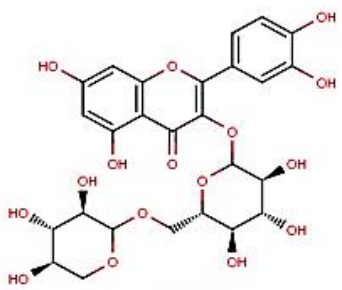
Sayed et al. *RSC Adv.*, 2020, 10, 19790

Classes de Biomoléculas Promissoras no combate a COVID-19

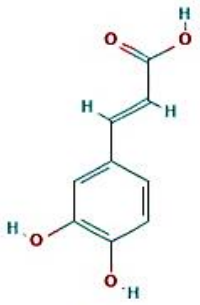


Fonte: Base de dados UFC, maio 2020.
MGVSilva et al.

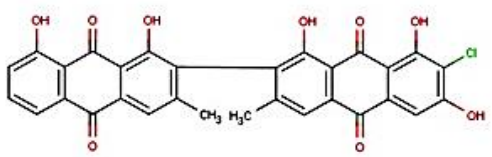
Biomoléculas Promissoras no combate a COVID-19* isoladas de espécies cultivadas e nativas do Nordeste do Brasil.



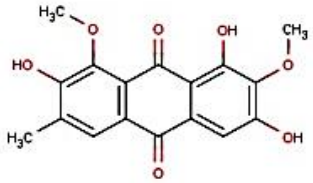
Rutina
Senna macranthera



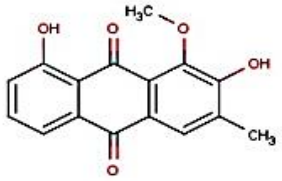
Ácido caféico
Ocimum gratissimum



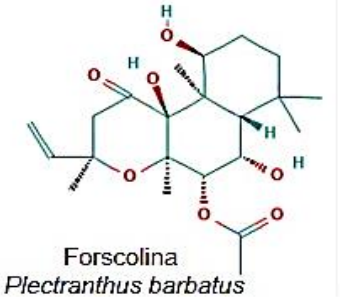
7'-Cloro-1,1',6',8,8'-pentaidroxi-3,3'-dimetil
-2,2'-biantraquinona
Senna siamea



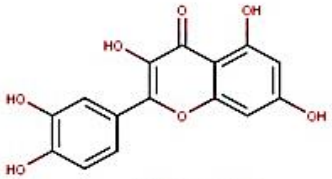
1,3,7-Tri-hidroxi-2,8-di-metoxi
-6-metil-antraquinona
Senna tora



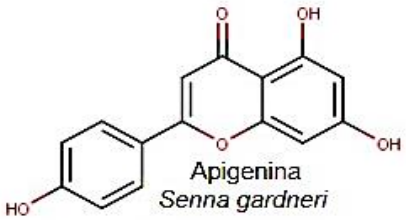
Obtusifolina
Senna obtusifolia



Forscolina
Plectranthus barbatus



Quercetina
Senna cearensis



Apigenina
Senna gardneri



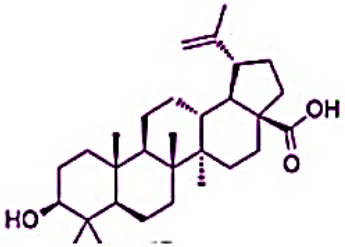
Kaempferol
Ocimum basilicum

***Apresentam atividade antiviral e/ou inibidora da enzima conversora da Angiotensina (ACE2)**

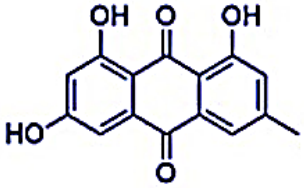
Fonte: Base de dados UFC, maio 2020.

MGVSilva et al.

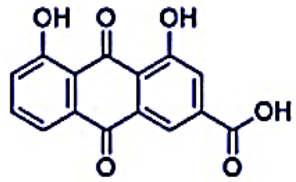
Biomoléculas com ação inibidora contra SARS-CoV isoladas de espécies nativas do Nordeste do Brasil.



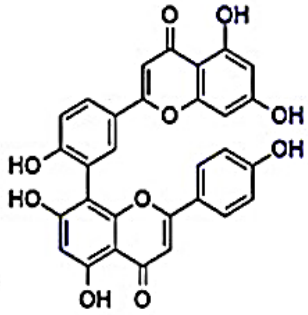
Ácido betulínico (IC_{50}= 8,2 µmol.L^{-1})*
Senna spectabilis var *excelsa* (cassia do nordeste)



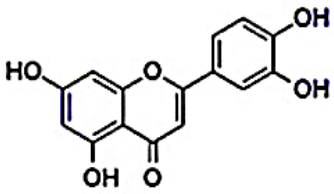
Emodina (IC_{50}= 1,0 µmol.L^{-1})*
Vatairea macrocarpa (amargoso)



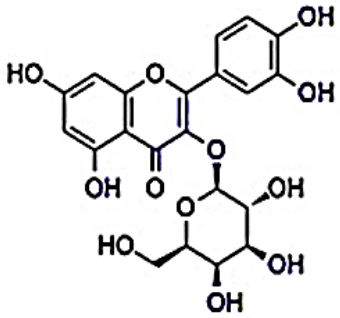
Reína (IC_{50}= 9,5 µmol.L^{-1})*
Senna fistula (chuva de ouro)



Amentoflavona (IC_{50}= 8,3 µmol.L^{-1})*
Poincianella pyramidalis (catingueira)



Luteolina (IC_{50}= 20,0 µmol.L^{-1})*
Senna alata (fedegoso grande)



Hiperosídeo (IC_{50}= 42,8 µmol.L^{-1})*
Senna reticulata (majerioba grande)

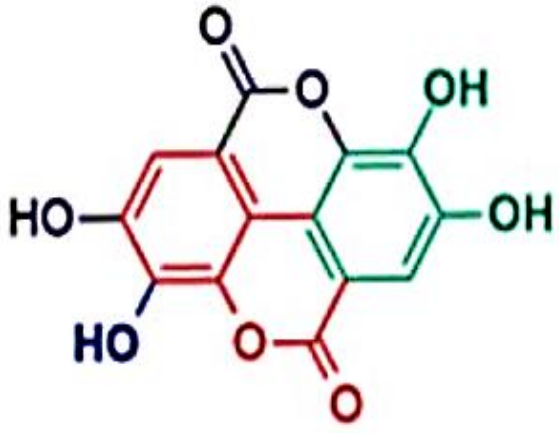


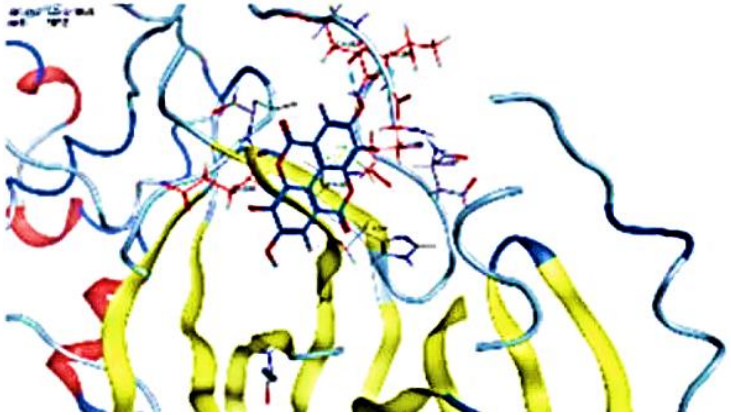
Senna fistula L.
(Chuva de ouro)

Fonte: Base de dados UFC, maio 2020. MGVSilva et al.

*Plpro e Mpro; Sayed et al. *RSC Adv.*, 2020, 10,19790.

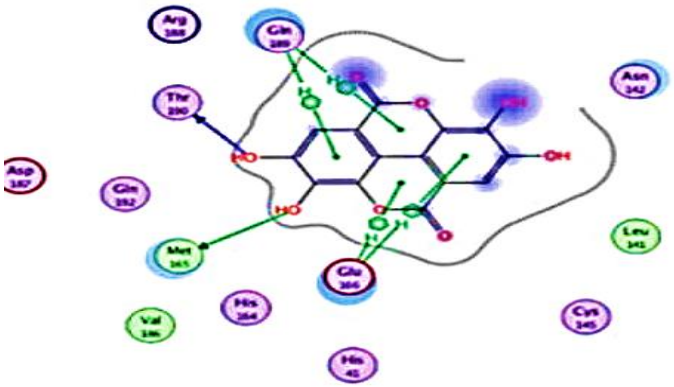
Top em ensaio com 496 moléculas com ação inibidora contra SARS-CoV em ensaio *in silico.*





Ácido elágico

***Poincionella pyramidalis* (catingueira)**
***Ocimum sanctum* (manjericão sagrado)**
Características drug-like
Biodisponibilidade oral.



Proteína viral utilizada: Main protease (M^{pro}). Sayed et al. *RSC Adv.*, 2020, 10, 19790