

CAS STNnext[®] COFFEE LECTURE

PREPRINTS IN CAPLUS

Sarah W. Stokes, FIZ Karlsruhe

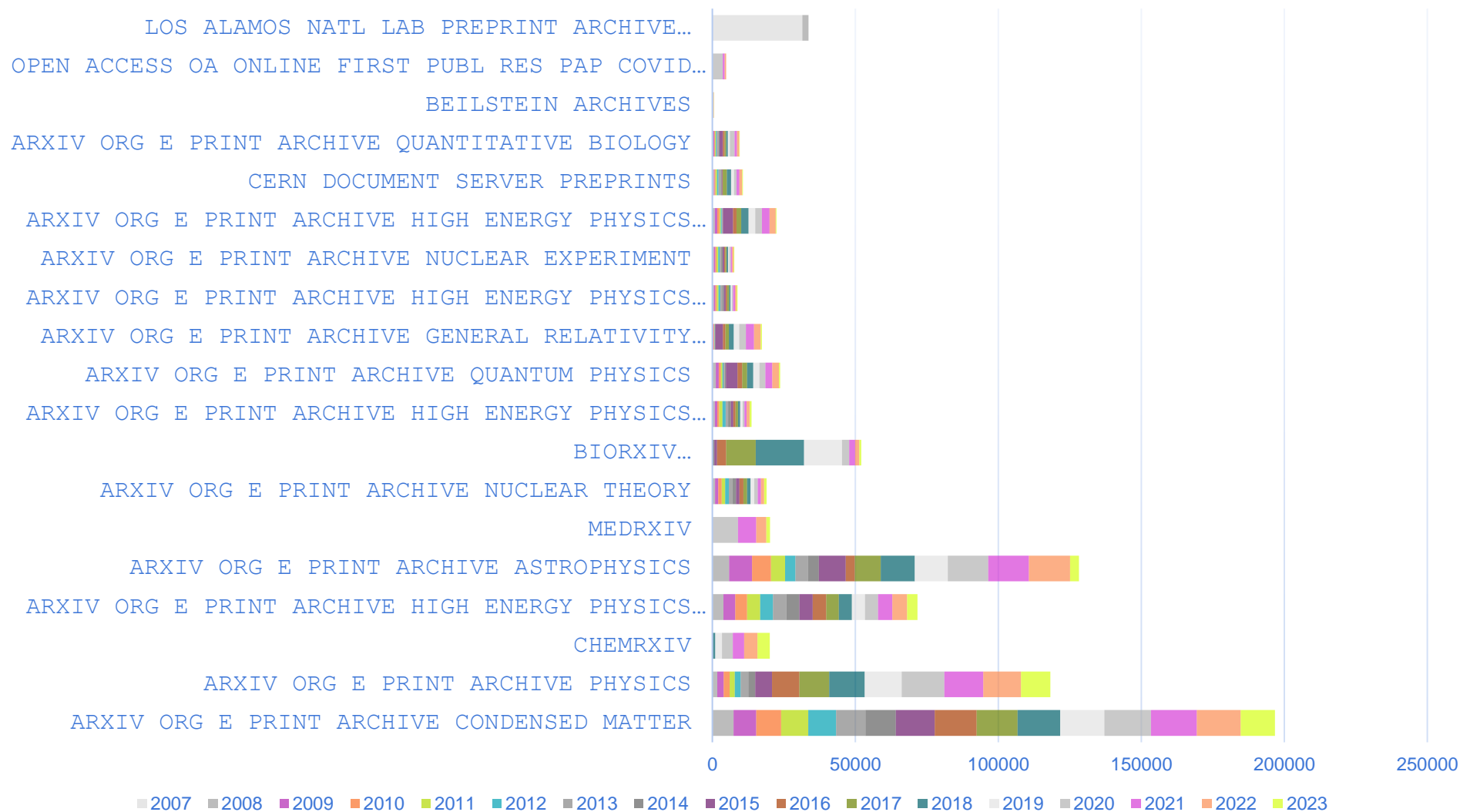
What are Preprints?

- Pre-publication versions of articles are often released ahead of print
- Some (but not all) of these preprints are eventually published in scholarly journals
- The published document often differs from the preprint in terms of indexing, authors, etc., depending on editing that occurs prior to publication
- Preprint publications are often the earliest public mention of scientific discovery/invention

Preprint coverage in CAPLUS

- CAS acquires preprint data from a number of third-party preprint servers for inclusion in CAplus
- Over 910K preprint records currently (11/23) included in CAplus
- Major sources of coverage include ARXIV servers, Los Alamos National Laboratory, Beilstein, and open access preprint publications
- COVID-19 specific preprint servers included as well

PREPRINT SERVER COVERAGE IN CAPLUS BY YEAR



Why include preprint searching?

- Preprints are often the first public mention of new technology, treatments, or inventions
- Preprint publications sometimes are cited by research that is published prior to the publication of the eventual document, which can also give early data in IP searching
 - While the majority of citations will be to the publication, over 100K preprints in CAplus contain citation information for citing documents
- Since these are early publications, they can be used to follow breakthroughs and early trends in new areas of research – this was shown to be true since the early pandemic with emerging treatments for COVID-19

```
=> s preprint/dt and osc.g>=25
```

```
910559 PREPRINT/DT
```

```
5458469 OSC.G>=25
```

```
L1 10348 PREPRINT/DT AND OSC.G>=25
```

Example: Emerging treatment options

- Find preprint materials in Caplus covering the emerging findings that COVID-19 replication is inhibited by the SSRI fluoxetine – a new potential use for this existing drug
- Find eventual publications in scholarly journals of these documents
- Compare and contrast entry date to show earlier availability of preprint materials, as well as indexing and other published data to see differences between preprint and eventual publication

Broad keyword search combined with /DT

```
=> S (?FLUOXETIN? (10A) (?SARS? OR ?COVID?)) AND PREPRINT/DT
```

```
17181 ?FLUOXETIN?
```

```
167683 ?SARS?
```

```
218090 ?COVID?
```

```
47 ?FLUOXETIN? (10A) (?SARS? OR ?COVID?)
```

```
913707 PREPRINT/DT
```

```
L1 9 (?FLUOXETIN? (10A) (?SARS? OR ?COVID?)) AND PREPRINT/DT
```

Preprint search yields highly relevant research

```
L1 ANS L1 ANSWER 5 OF 9 CAPLUS COPYRIGHT 2023 ACS on STN
TI L1 TI Targeting the endolysosomal host-SARS-CoV-2 interface by the clinically
TI TI licensed antidepressant fluoxetine
DT DT Preprint
DT ST fluoxetine SARS CoV2 coronavirus endolysosome COVID19 antiviral agent
IT AB IT Endosome
IT Lysosome
(endolysosome; targeting the endolysosomal host-SARS-CoV-2
interface by the clin. licensed antidepressant fluoxetine)
IT IT Endocytosis
(inhibition of; targeting the endolysosomal host-SARS-CoV-2
interface by the clin. licensed antidepressant fluoxetine)
IT IT Anticoronaviral agents
ST ST Antidepressants
COVID-19
```


Search CAPlus for related publications

```
=> S (?FLUOXETIN? (10A) (?SARS? OR ?COVID?)) NOT PREPRINT/DT
```

```
17181 ?FLUOXETIN?
```

```
167683 ?SARS?
```

```
218090 ?COVID?
```

```
47 ?FLUOXETIN? (10A) (?SARS? OR ?COVID?)
```

```
913707 PREPRINT/DT
```

```
L2 38 (?FLUOXETIN? (10A) (?SARS? OR ?COVID?)) NOT PREPRINT/DT
```

Compare preprints with publications

Title	Accession Number Preprint	Accession Number Pub	Author/Inventor Preprint	Author/Inventor Publication	PA/CS Preprint	PA/CS Pub	Publisher Preprint	Publisher Publication	Source Preprint	Source Publication
Antidepressant and antipsychotic drugs reduce viral infection by SARS-CoV-2 and fluoxetine show antiviral activity against the novel variants in vitro	2021:731212 HCAPLUS	2022:1214608 HCAPLUS	Fred, Senem Merve; Kuivanen, Suvi; Ugurlu, Hasan; Casarotto, Plinio Cabrera; Levanov, Lev; Saksela, Kalle; Vapalahti, Olli; Castren, Eero	Fred, Senem Merve; Kuivanen, Suvi; Ugurlu, Hasan; Casarotto, Plinio Cabrera; Levanov, Lev; Saksela, Kalle; Vapalahti, Olli; Castren, Eero	Neuroscience Center - HiLIFE, University of Helsinki, Finland	Neuroscience Center- HiLIFE, University of Helsinki, Helsinki, Finland	Cold Spring Harbor Laboratory Press	Frontiers Media S.A.	bioRxiv (2021) 1-18, 2021 CODEN: BIORFP URL: https://www.biorxiv.org/	Frontiers in Pharmacology (2021), 12, 755600 CODEN: FPRHAU; ISSN: 1663-9812 URL: http://www.frontiersin.org/Pharmacology
Fluoxetine pharmacokinetics and tissue distribution suggest a possible role in reducing SARS-CoV-2 titers	2021:150 HCAPLUS							Frontiers Media S.A.	medRxiv (2020) 1-14, 2020 CODEN: MEDRCQ URL: https://www.medrxiv.org/	F1000Research (2021), 10, 477 CODEN: FRESJL; ISSN: 2046-1402 URL: http://f1000research.com/

<u>ED Preprint</u>	<u>ED Pub</u>	<u>Difference</u>
30-Mar-21	10-May-22	406
5-Jan-21	13-Feb-22	404
26-Oct-20	7-Apr-21	163
5-Aug-20	29-Dec-20	146
23-Jun-20	22-Mar-21	272
	average:	278.2

Example: Keeping up with trends

- In the early pandemic, preprints were very useful to researchers trying to find existing drugs that might have activity against COVID-19, but many were quickly found to be ineffective.
- Analysis of preprint data for this type of substance can give us an idea of whether a potential treatment was later found to have any efficacy
 - The publication patterns of preprint data can shed insight into how viable a candidate a potential treatment turned out to be

Analyze preprint results for substances by year to see trends

```
=> S "Hydroxychloroquine" AND PREPRINT/DT AND PY>=2020
```

```
8861 "HYDROXYCHLOROQUINE"  
3 "HYDROXYCHLOROQUINES"  
8861 "HYDROXYCHLOROQUINE"  
(  
913707 PREPRINT/DT  
11599963 PY>=2020  
L3 407 "HYDROXYCHLOROQUINE"
```

```
=> ANA 1- PY
```

```
L4 ANALYZE
```

```
=> S "Ivermectin" AND PREPRINT/DT AND PY>=2020
```

```
7863 "IVERMECTIN"  
26 "IVERMECTINS"  
7865 "IVERMECTIN"  
("IVERMECTIN" OR "IVERMECTINS")  
913707 PREPRINT/DT  
11599963 PY>=2020  
L5 105 "IVERMECTIN" AND PREPRINT/DT AND PY>=2020
```

```
=> ANA 1- PY; D 1-
```

```
L6 ANALYZE L5 1- PY : 4 TERMS
```

Compare Entry Data to check viability

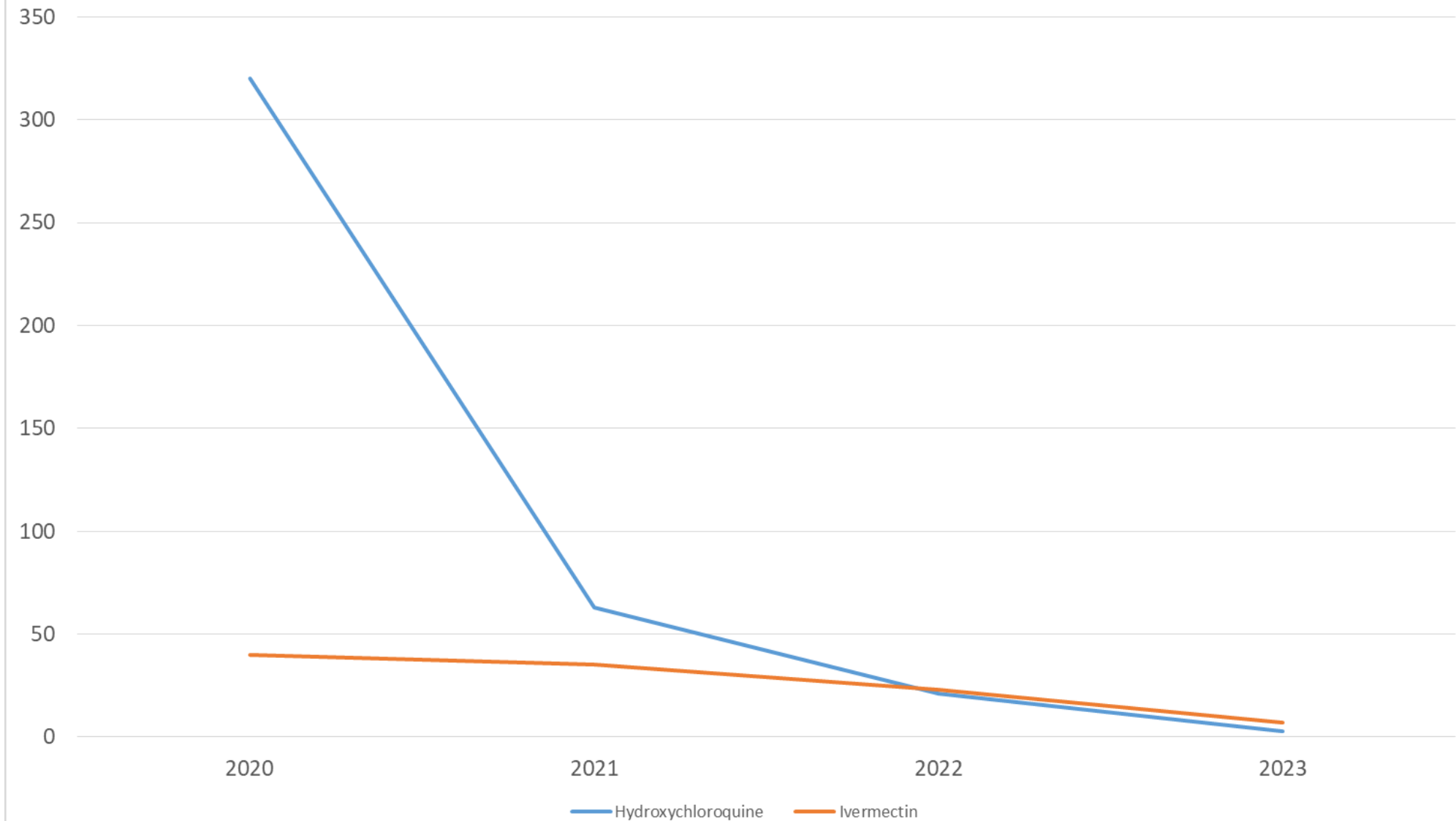
L4 ANALYZE L3 1- PY : 4 TERMS					
TERM #	# OCC	# DOC	% DOC	PY	
1	320	320	78.62	2020	
2	63	63	15.48	2021	
3	21	21	5.16	2022	
4	3	3	0.74	2023	
***** END OF L4 *****					

Hydroxychloroquine

L6 ANALYZE L5 1- PY : 4 TERMS					
TERM #	# OCC	# DOC	% DOC	PY	
1	40	40	38.10	2020	
2	35	35	33.33	2021	
3	23	23	21.90	2022	
4	7	7	6.67	2023	
***** END OF L6 *****					

Ivermectin

Emerging (eventually debunked) treatments by year, in preprint publication numbers



Summary

- Preprints can be the earliest available mention of a new technology or substance, which can be crucial for IP searching
 - Sometimes the preprint is available over a year in advance of the publication!
- Analysis of preprint publications trends gives insight into whether a promising potential invention resulted in publishable results
- Preprints add even more value to the timely coverage of documents in CAplus

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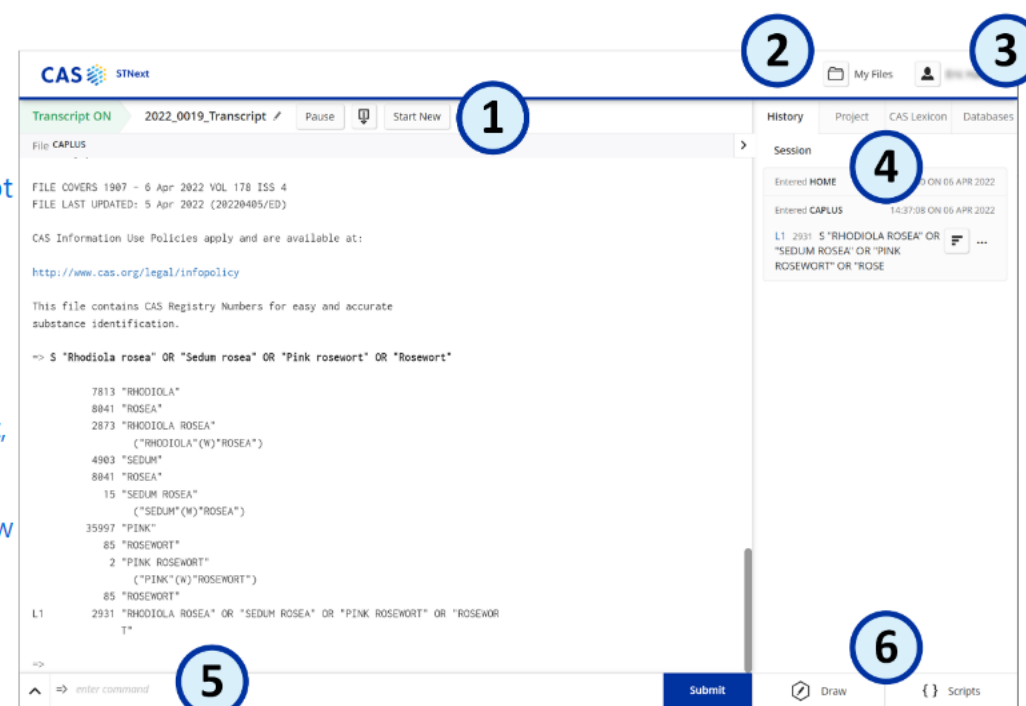
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Between problems and progress are connections that matter



Sarah W. Stokes
Senior Product Specialist, IP
sstokes@cas.org

CONTACT

CAS
help@cas.org
cas.org

FIZ Karlsruhe
EMEAhelp@cas.org
stn-international.de