INTREPID ALLIANCE

INTERNATIONAL READINESS FOR PREVENTING INFECTIOUS VIRAL DISEASE

05 JUN 2025

Antiviral Development Landscape for COVID-19 & Influenza

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ON BEHALF OF THE INTREPID ALLIANCE SCIENTIFIC WORKING GROUP

Disclaimer

The INTREPID Alliance is a not-for-profit consortium of innovative biopharmaceutical companies committed to accelerating antiviral research, aiming to ensure that we have a stronger pipeline and are better prepared for future pandemics.

As part of our efforts, the INTREPID Alliance maintains and publishes a centralized list of promising investigational candidate compounds, with the purpose of knowledge-sharing and to support better pandemic preparedness. These compounds have been selected based on objective, scientific criteria, using publicly available sources, and at arm's length from commercial influence of our member companies. See criteria listed in the report "Antiviral Clinical Development Landscape and Promising Clinical Compounds." The designation of certain compounds as promising is based upon currently available information, and exclusively upon an assessment against these criteria. "Promising" is not a promotional claim. Candidate compounds have not been assessed by regulatory authorities to be safe and efficacious for the treatment of disease in humans. Our content is designed to be factual, informative, and non-commercial. It is not designed or intended to advertise or promote any pharmaceutical product or therapy or to advance the commercial interests of any company.

Mission of INTREPID Alliance: Founded March 2022

The INTREPID Alliance is a non-profit consortium of eight pharmaceutical companies and affiliate organizations dedicated to accelerating the development of new treatments for emerging/future pandemic threats.

intrepidalliance.org

linkedin.com/company/intrepid-alliance

Antiviral Pipeline https://www.intrepidalliance.org/antiviral-pipeline/

The INTREPID Alliance augments the antiviral R&D ecosystem by:

- Providing a landscape and listing* of preclinical and clinical phase antivirals
- Generating publications on topics such as target compound profiles, animal/assay models, and “Deep Dives” on viral families
- Piloting an advisory program for biotechs and academia
- Advocating for the importance of antivirals as part of pandemic preparedness and will help catalyzed funding for antiviral R&D

abbvie
AMGEN
Bio Biotechnology Innovation Organization
GILEAD
Johnson&Johnson
NOVARTIS
Roche
Takeda

*These listings are rigorously derived from a monthly review of public information on the preclinical and clinical antiviral drug development landscape as described.

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INTREPID Alliance Landscape Analysis Components*

- Airfinity monitors 13 viral families that pose the greatest risk of pandemic potential.
  - With thanks to Airfinity for its contributions to the presentation.

Baseline Information

Included
- Direct-acting antivirals
- Small molecules
- Peptides
- RNA-based

→ Antiviral Pipeline

Excluded
- Antibodies
- Antibiotics & Anti-infectives
- Cell-based therapy
- Host Targets (incl. imm. mod.)
- Nutraceuticals
- Vaccines

- Emerging information is reviewed on a semi-annual basis.
- Antiviral Landscape updated on the INTREPID Alliance website on a semi-annual basis.

*Now 13 viral families to align with updated World Health Organization (WHO) Pathogens Prioritization report from June 2024.

Intrepid Alliance Antiviral Landscape: Overview of 13 Priority Viral Families*

As of December 18, 2024, for the 13 Viral Families with Greatest Risk of Pandemic Potential, Clinical Phase & Approved Antiviral Compounds Fall Into 9 of 13 and Preclinical Into 7 of 13

Primarily Respiratory Transmission

Pillar	Disease Indication (n)** Preclinical (103)	Clinical (39)
Adenoviridae	X	• HuAdeno A-G (1)
Coronaviridae	• COVID-19 (74) • MERS-CoV (5) • SARS-CoV-1 (5) • Seasonal CoV (1)	• COVID-19 (25)
Orthomyxoviridae	• Influenza (12)	• Influenza (10)
Paramyxoviridae	• Hendra virus (1) • Measles (1) • Nipah virus (3) • Parainfluenza (1)	X
Picornaviridae	X	• Polio (2) • Rhinovirus (1)

Primarily Contact/Vector-Mediated Transmission

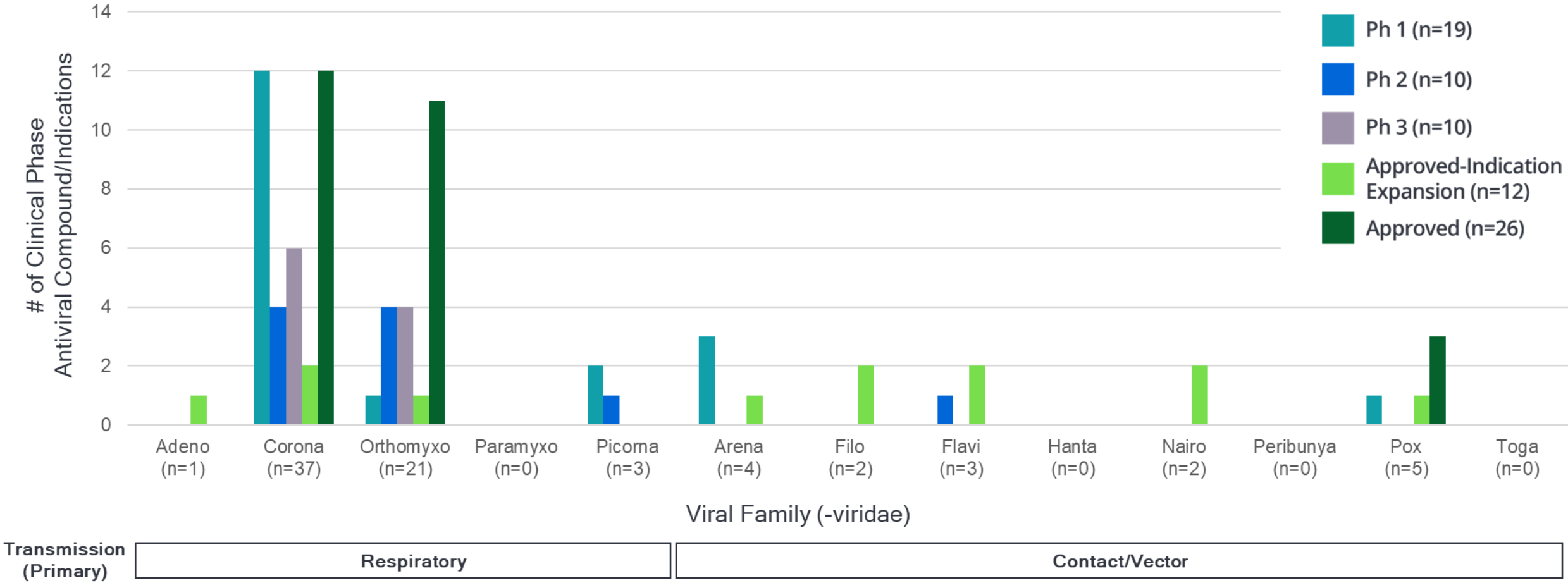
Pillar	Disease Indication (n)** Preclinical (22)	Clinical (13)
Arenaviridae	• Junin virus (1) • Lassa fever (1)	• Lassa fever (3) • Chapare hem. fever (1)
Filoviridae	X	• Ebola (2)
Flaviviridae	• Dengue (5) • West Nile (1) • Yellow fever (1) • Zika (2)	• Dengue (3)
Hantaviridae	X	X
Nairoviridae	X	• Crimean Congo hem. fever (2)
Peribunyaviridae	X	X
Poxviridae	• Mpox (8)	• Mpox (2)
Togaviridae	• Chikungunya (3)	X

X = absence of preclinical or clinical phase antivirals

*As of December 18, 2024; **Number of compounds in ongoing development; excludes indication expansions.

The Majority of Clinical Phase Antiviral Compound/Indications Are Targeting Coronaviruses and Orthomyxoviruses*

Clinical Phase Antiviral Compound/Indications by Virus Family (4th Edition, N=78)



*As of December 18, 2024. Adenoviridae has 1 clinical phase program listed in Archived.

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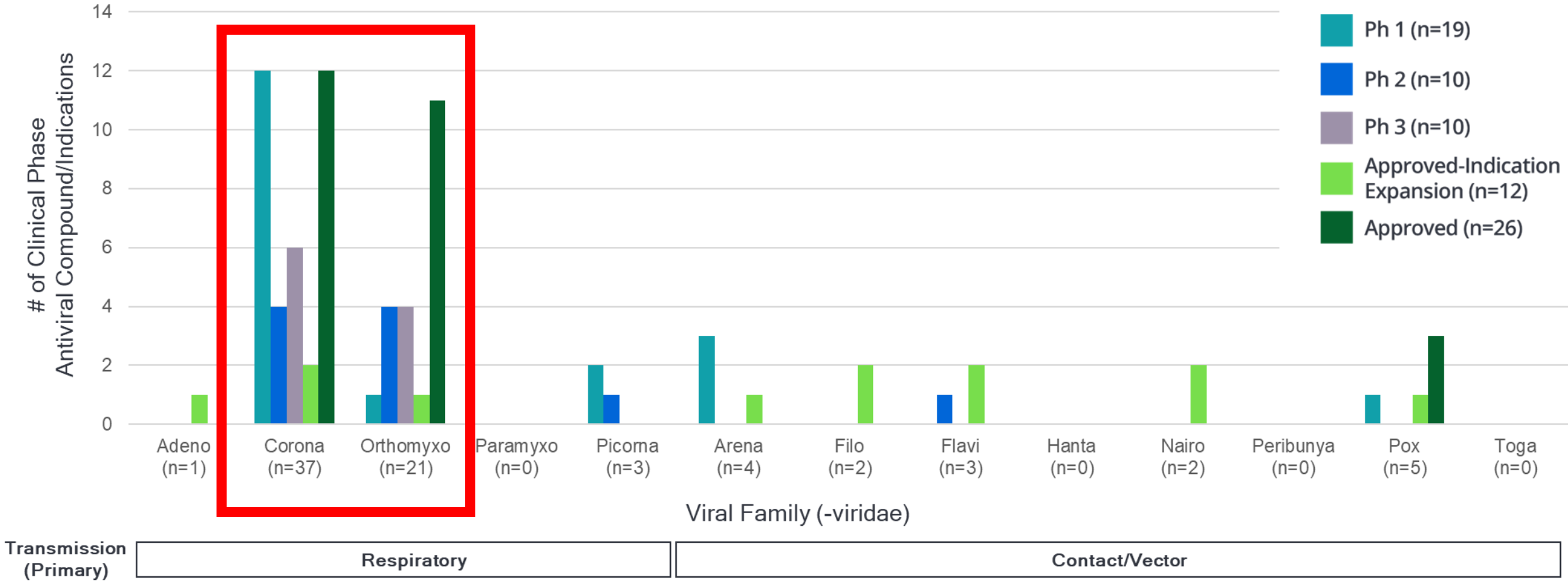

*As of December 18, 2024. Adenoviridae has 1 clinical phase program listed in Archived.

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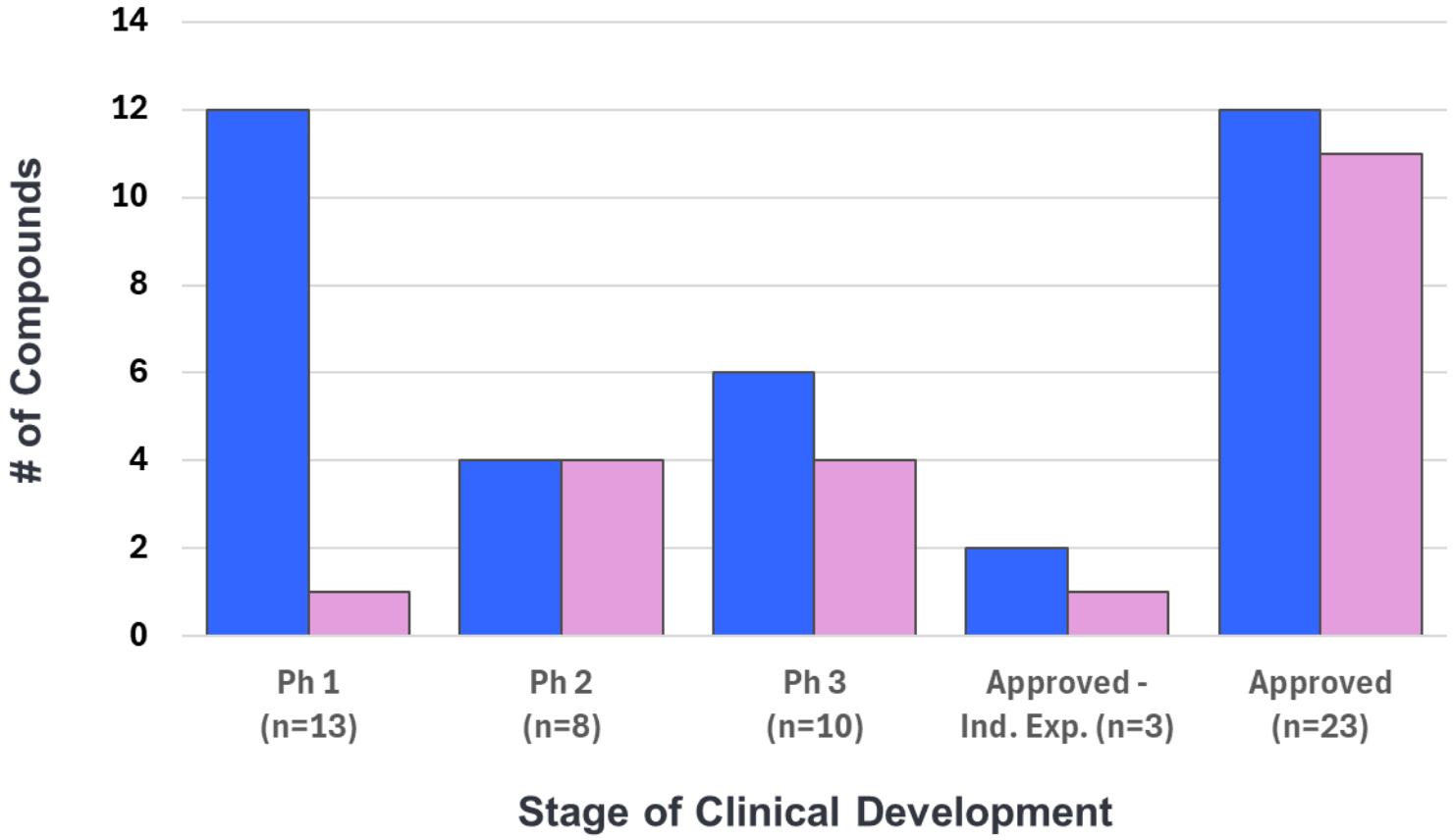
Antiviral Compounds for COVID-19 and Influenza Span the Stages of Clinical Development*

Comparable numbers of late stage and approved compounds identified for COVID-19 and Influenza
Early development (Phase 1) has more activity for COVID-19



COVID-19 (n=36)

- 12 Approved compounds
- Ongoing Indication Expansion evaluations with 2 compounds already approved only for Influenza
  - Amantadine, Oseltamivir
- 10 compounds in Phase 2/3
- 12 compounds in Phase 1

Influenza (n=21)

- 11 Approved compounds
- Ongoing Indication Expansion evaluation with 1 compound currently approved only for COVID-19
  - Molnupiravir
- 8 compounds in Phase 2/3
- 1 compounds in Phase 1

*As of December 18, 2024; Number of compounds in ongoing development; Approved – Ind. Exp.= ongoing Indication Expansion evaluation with an antiviral approved for a different virus disease indication.

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Protease Inhibitors Predominate the Antiviral Mechanisms of Action in Clinical Development for COVID-19*

Compounds approved for COVID-19 are primarily protease or replication inhibitors.
68% (15/22) compounds in clinical development are SARS-CoV-2 main protease inhibitors.
There are no active programs identified for compounds targeting assembly-release.

Stage of Development	ANTIVIRAL MECHANISM OF ACTION									
	ENTRY (n = 1 + 6)		PROTEASE (n = 4 + 15)				REPLICATION (n = 7 + 1)		ASSEMBLY-RELEASE (n = 0)	
Approved (n=12)	Umifenovir		Ensitrelvir				Molnupiravir	Azvudine		
			Nirmatrelvir/rtv				Remdesivir	Enisamium (VR17-04)		
			Leritrelvir (RAY1216)				Favipiravir	Triazavirin		
			Simnotrelvir/rtv					Mindeudesivir (VV116)		
Phase 3 (n=6)	YKYY017		GST-HG171	FB2001						
			QLS1128	WPV01						
			STI-1558							
Phase 2 (n=4)			EDP-235				SHEN26			
			Ibuzatrelvir							
			HS 10517/Ritonavir							
Phase 1 (n=12)	Delcetravir	NV-387	ALG-097558	ISM3312						
	HY3000	RQ-01	ASC11/Ritonavir	Limnetrelvir (ABBV 903)						
	IPD-52520		CDI-988	S-892216						
			GS-00202							

*As of December 18, 2024

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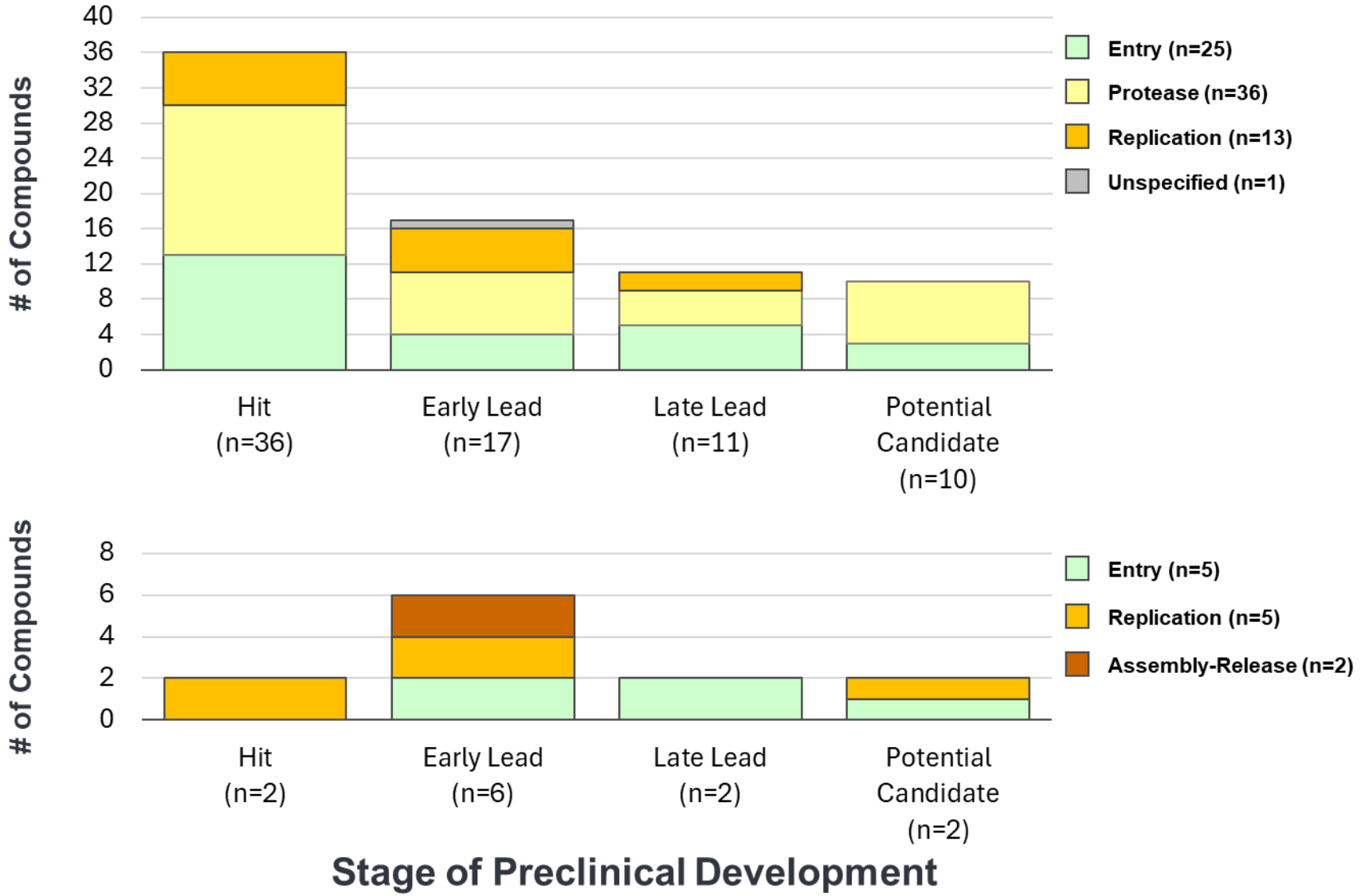
Replication Inhibitors Predominate the Antiviral Mechanisms of Action in Clinical Development for Influenza*

Stage of Development	ANTIVIRAL MECHANISM OF ACTION**		
	ENTRY (n= 3 + 1)	REPLICATION (n= 4 + 6)	ASSEMBLY-RELEASE (n= 4 + 2)
Approved (n=11)	Amantadine	Baloxavir Marboxil	Laninamivir
	Rimantadine	Favipiravir	Oseltamivir
	Umifenovir	Triazavirin	Peramivir
		Enisamium (VR17-04)	Zanamivir
Phase 3 (n=4)		GP681	
		SHEN26	
		TG-1000	
		ZX-7101A	
Phase 2 (n=4)	CD388	CC-42344	HNC042
			AV5080
Phase 1 (n=1)		TRX100 (AV5124)	

- Similar numbers of approved compounds for Influenza across antiviral mechanisms of action.
- In clinical development, replication inhibitors are the most common.
  - Primarily targeting viral polymerase or endonuclease

*As of December 18, 2024 ; ** Host proteases mediate viral protein cleavage.

The Majority of Active Preclinical Antiviral Programs Include Compounds for COVID-19 and Influenza Disease Indications (75 (59.5%) and 12 (9.5%) of 12, respectively)*



COVID-19 (n=75)

- Protease inhibitors (36/75, 48%) and entry inhibitors (25/75, 33%) are distributed across the stages of preclinical development.
- The majority of protease inhibitors target the main protease (Mpro) whereas the entry inhibitors are evaluating different entry-related targets.

Influenza (n=12)

- 12 compounds of all the 51 Non-COVID-19 compounds (23.5%) across the entire preclinical landscape
- Entry inhibitors have the most representation in later stage preclinical

*As of December 18, 2024

Summary of INTREPID Alliance Preclinical and Clinical Development Landscape for COVID-19 and Influenza (4th Edition)*

- Compounds targeting SARS-CoV-2 or influenza antiviral mechanisms of action predominate the preclinical and clinical antiviral landscape across 13 viral families with pandemic potential
- 20 distinct direct-acting antiviral compounds have regulatory approvals for COVID-19 or Influenza
  - 9 for COVID-19; 8 for Influenza; 3 for both COVID-19 and Influenza
- The majority of compounds with on-going preclinical and clinical activity are targeting:
  - COVID-19: the SARS-CoV-2 main protease
  - Influenza: the influenza viral proteins associated with replication
- Robust clinical evaluation and a viable regulatory strategy are needed to demonstrate:
  - The potential clinical benefit (e.g., safety and efficacy) addressing unmet medical need(s).
  - The potential utility for treating circulating viral variants resistant to current approved treatments
  - The barrier to development of resistance for each compound and compound class
  - The potential use of combination treatment strategies

*As of December 18, 2024; **Some compounds are being evaluated for more than one viral indication.

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INTERNATIONAL READINESS FOR PREVENTING INFECTIOUS VIRAL DISEASE

Interested in engaging with us?

We welcome all feedback through our online portal. As with previous listings, developers are invited to submit non-confidential information on their compound candidates. All reports are updated quarterly.

For more information, please feel free to email me at jim@intrepidalliance.org.

intrepidalliance.org

linkedin.com/company/intrepid-alliance

Supplemental Information

Mission of INTREPID Alliance: Founded March 2022

The INTREPID Alliance is a consortium of eight pharmaceutical companies and affiliate organizations dedicated to accelerating the development of new treatments for emerging/future pandemic threats

The IA is supportive of and contributing to the 100 Days Mission (100 Days Mission June 2021) and the International Pandemic Preparedness Secretariat (IPPS) Science and Technology Group (STEG)

The INTREPID Alliance will generate a landscape and listing* of antivirals that are:

- Phase 2-ready that can be quickly deployed into Phase 2/3 clinical trials following the identification of an emerging pandemic (i.e., as proposed by the 100-Days Mission)
- Preclinical stage compounds that may have utility against thirteen viral families identified by INTREPID Alliance as having potential to result in a pandemic

- The Alliance will help create efficiencies in antiviral R&D through publications such as target compound profiles; animal/assay other model landscaping; and by piloting an advisory program for biotechs and academia
- The Alliance will advocate the importance of antivirals as part of pandemic preparedness and will help catalyzed funding for antiviral R&D

abbvie
AMGEN
Bio Biotechnology Innovation Organization
GILEAD
Johnson&Johnson
NOVARTIS
Roche
Takeda

*These listings are rigorously derived from a monthly review of public information on the preclinical and clinical antiviral drug development landscape as described here.

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INTREPID Alliance Antiviral Landscape: Our Approach

- **INTREPID Alliance Landscaping Activities**
  - Highlight strengths and weaknesses of the antiviral drug development pipeline for potential pandemic viral pathogens
  - Support the 100 Days Mission (100DM) which seeks to identify two 'Phase 2 ready' therapeutic candidates against each of the identified viral pathogen families of greatest pandemic potential
- **Landscape Analysis**
  - A living analysis of the antiviral landscape that will be updated based on emerging data
  - Derived from Airfinity database information on diverse compounds against 13 viral families (see slide 7)
  - Focused on direct-acting small molecule antivirals
- **Timing and Publication on Website**
  - **1st Edition:** Initial triage and selection of clinical compounds with favorable properties and antiviral mechanism of action – January 2024
  - **2nd Edition:** Detailed review and identification of most Promising Clinical and Approved-Indication Expansion Compounds – April 2024
  - **3rd Edition**: Quarterly update for Clinical Development Landscape; initial Antiviral Preclinical Development Landscape release; Mpox Clinical and Preclinical Landscape - October 2024
  - **4th Edition**: Quarterly update for Clinical and Preclinical Antiviral Landscape – April 2025
  - Semi-Annual Updates – Ongoing

Landscape Analysis Components*

Airfinity monitors 13 viral families that pose the greatest risk of pandemic potential.

With thanks to Airfinity for its contributions to the presentation.

Baseline Information Identified:

- Diverse Compound/Indications by Viral Family and Disease
- Phase of Development (e.g., Preclinical through Phase 4, Approved)
- MOA/Target
- Route of Administration
- Developer or Sponsor (Type, Location)
- Clinical Trials (Links, Status, Trial Site Locations)

Inclusion Criteria:

- Preclinical & Clinical
  - Known antiviral MOA
  - *In vitro/In vivo* activity
  - Small molecules
  - Peptides
  - RNA-based
- Clinical
  - SAD/MAD data ongoing or completed
  - FIH ongoing or completed
  - No major safety signals

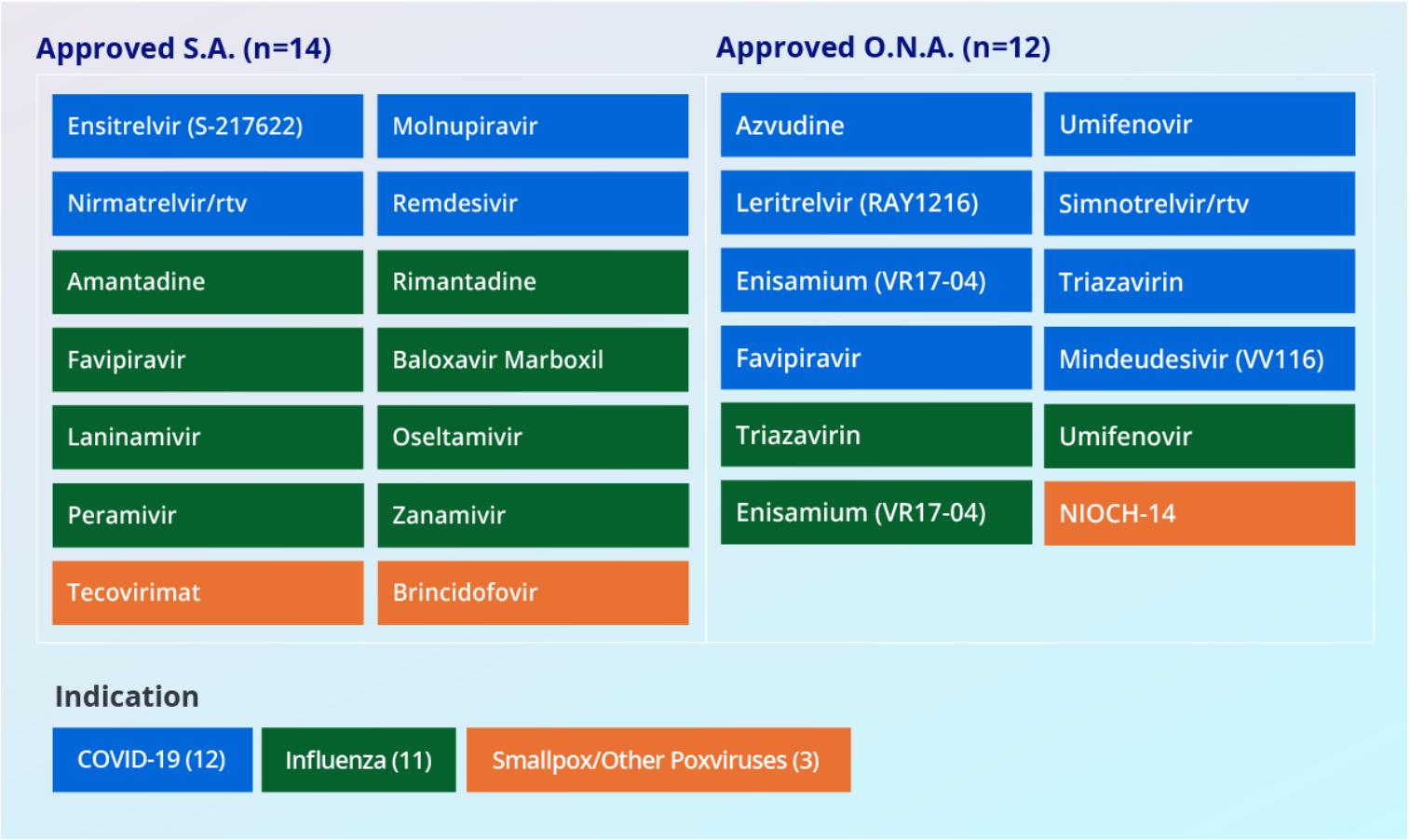
Figures & Tables:

- 13 Viral Families of Interest for Pandemic Preparedness
- Total Pipeline by Viral Family
- Promising Clinical and Indication-Expansion Compounds
- Compounds by Viral Family and Phase of Development
- Compounds by MOA/Target and Viral Family
- Phase of development vs viral disease for each MOA
- Developer or Sponsor
- Preclinical compounds

- Emerging information is reviewed on a semi-annual basis.
- Antiviral Landscape updated on the INTREPID Alliance website on a semi-annual basis.

*Now 13 viral families to align with updated World Health Organization (WHO) Pathogens Prioritization report from June 2024.
MOA: mechanism of action; SAD/MAD: Single Ascending Dose/Multiple Ascending Dose; FIH: first-in-human.

Approved Antivirals: COVID-19, Influenza, Smallpox/Other Poxviruses*



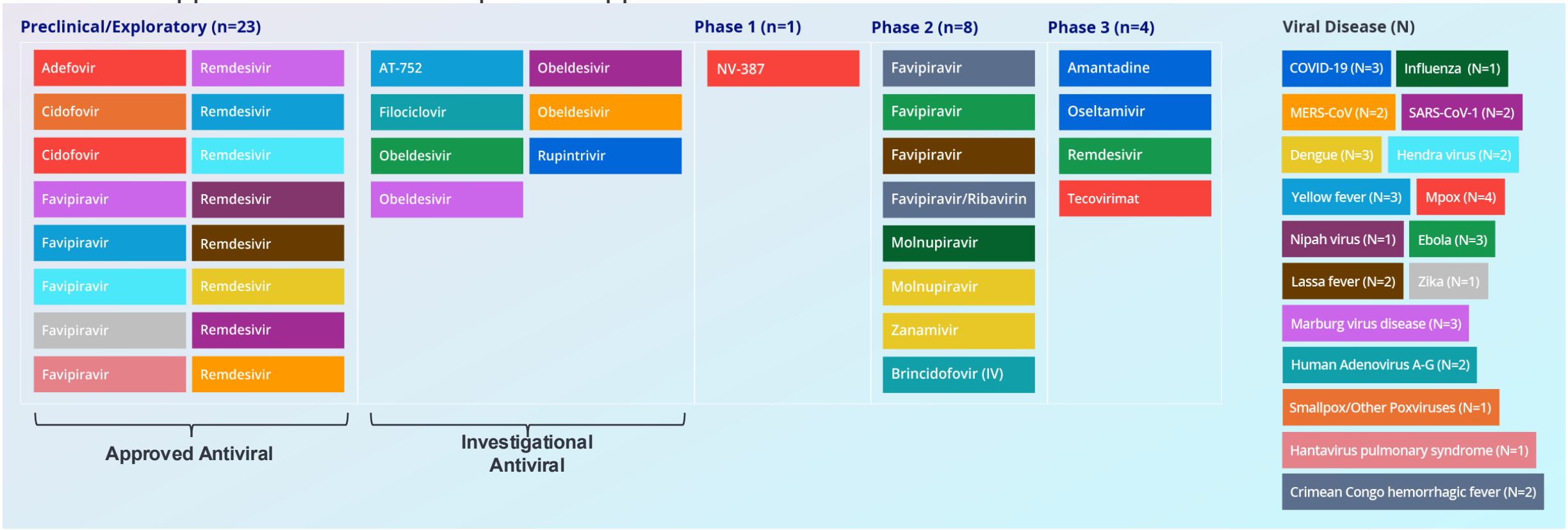
- **22** distinct antiviral compounds have received regulatory approval for COVID-19, Influenza, or Smallpox/Other Poxviruses
- **4** compounds are approved for COVID-19 and Influenza (favipiravir, triazavirin, umifenovir, and enisamium)
- **3** compounds have regulatory authorization by Animal Rule Development or similar mechanism
  - Tecoviramat is approved for Smallpox in U.S. & EU, and Cowpox and Mpox in EU only
  - Brincidofovir for Smallpox in U.S.
  - NIOCH-14 for Smallpox in Russia

*As of December 18, 2024; WHO defined Other National Authority (https://www.who.int/publications/m/item/list-of-transitional-wlas).

Antiviral-Indication Expansions: Preclinical & Clinical Compound/Indications (N=36)

Investigational: Antiviral compounds in clinical phase development for a different virus disease indication.

Approved: Antiviral compounds approved for treatment of a different virus disease indication.



- **6** of these antivirals (favipiravir, remdesivir, molnupiravir, amantadine, oseltamivir, & zanamivir) are approved for treatment of COVID-19 and/or Influenza.
  - Adefovir is approved for treating Hepatitis B virus disease and cidofovir is approved for treating CMV disease.
  - Tecovirimat is approved for treating smallpox.
- Favipiravir and remdesivir have the most indication expansions under evaluation (**9 each**).

*As of December 18, 2024; Clinical phase Investigational (Unapproved) and Approved antivirals being explored for expanded indications.

All Clinical Phase & Approved Antivirals (N=75)

INTREPID Alliance Analysis (4th Edition)*

*December 18, 2024 data with “Promising” Analysis defined in March 2024.

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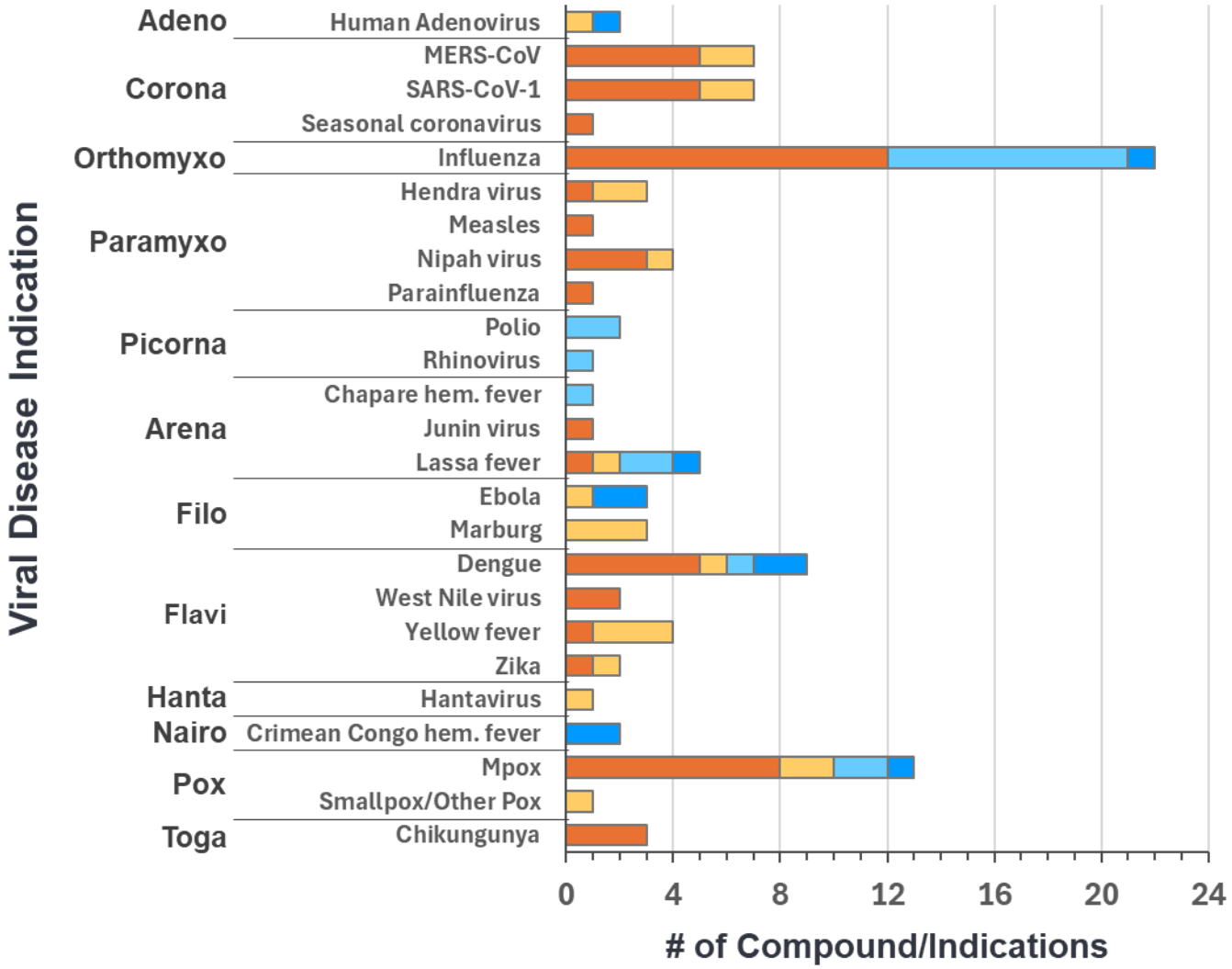
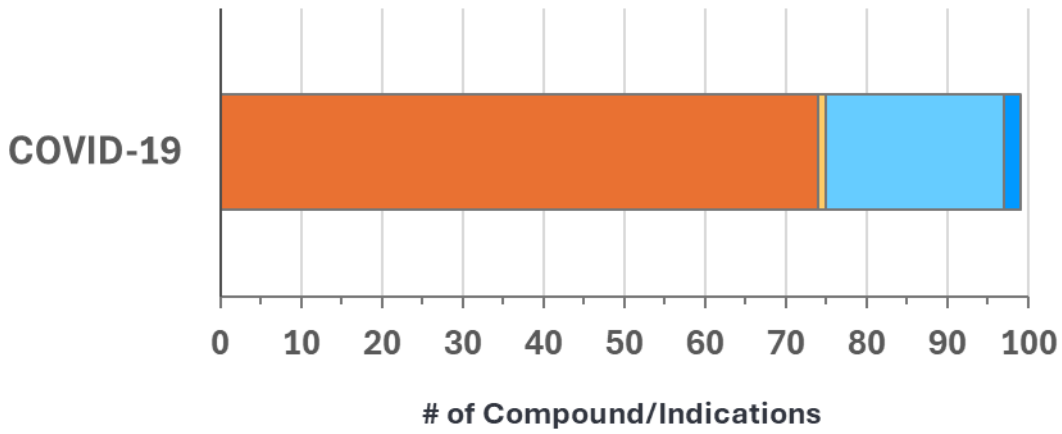
INTREPID Alliance Antiviral Landscape: Overview of 13 Priority Viral Families*

As of Dec 18, 2024, for the 13 viral families with greatest risk of pandemic potential, clinical phase & approved antiviral compounds fall into 9 of 13 and preclinical into 10 of 13.





- These data include those studied for indication expansions.
- **Most are focused on COVID-19 followed by Influenza.**
- No preclinical development activity was found for 3 of the 13 viral families (*Nairoviridae, Peribunyaviridae, & Picornaviridae*).
- No clinical development activity was found for 4 viral families (*Paramyxoviridae, Peribunyaviridae, Hantaviridae, & Togaviridae)*

Preclinical Phase

- Preclinical (no clinical data)
- Preclinical Exploratory

Clinical Phase

- Approved Antiviral- Indication Expansion
- Investigational Promising/Watch & Wait

*As of December 18, 2024 ;
**Number of compounds in ongoing development.

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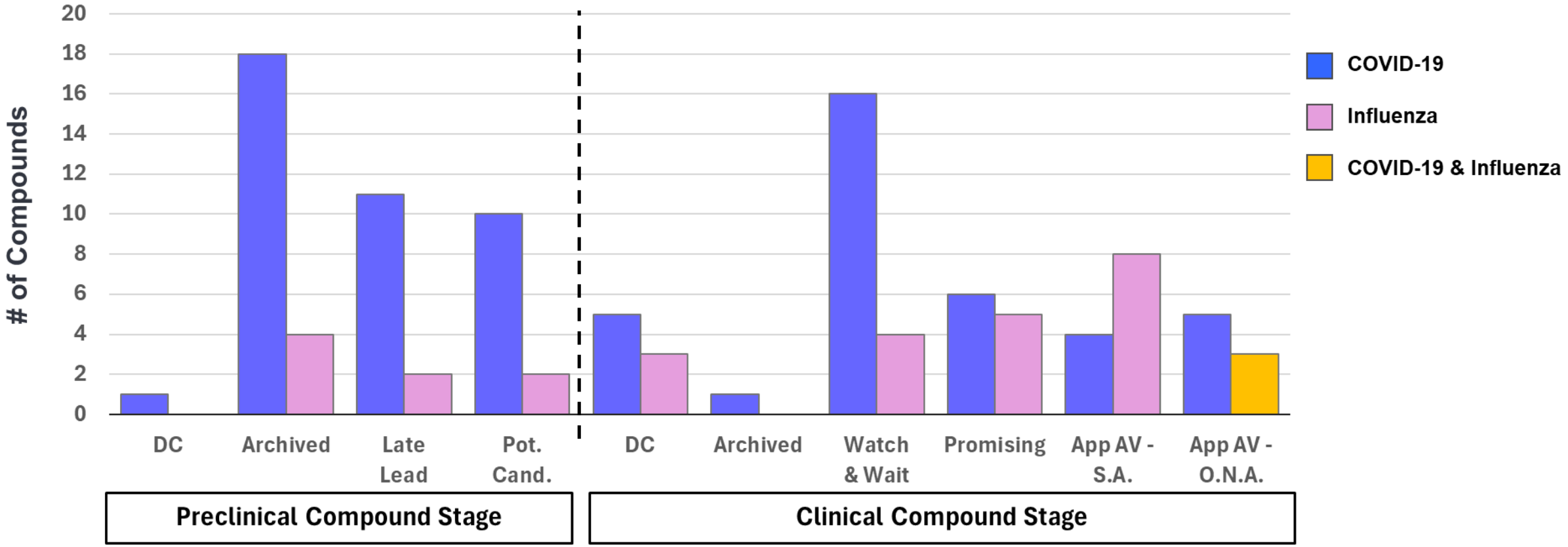
Antiviral Compounds for COVID-19 and Influenza Span the Stages of Preclinical & Clinical Development*

COVID-19 has more compounds in later stages of preclinical development than Influenza or any other virus indication.
Three compounds are approved for both COVID-19 and Influenza.
The number of COVID-19 compounds categorized as Archived or Discontinued increased since previous reports.



*As of December 18, 2024; DC: discontinued, Pot. Cand.:Potential Candidate, App AV: approved antiviral, S.A.: stringent authority, O.N.A.: other national authority; 3 compounds are approved for both COVID-19 and Influenza

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Preclinical Compounds by Stage of Preclinical Development: COVID-19 Indications

The majority of preclinical compounds are under evaluation for SARS-CoV-2/COVID-19 (74/125, 59.2%).

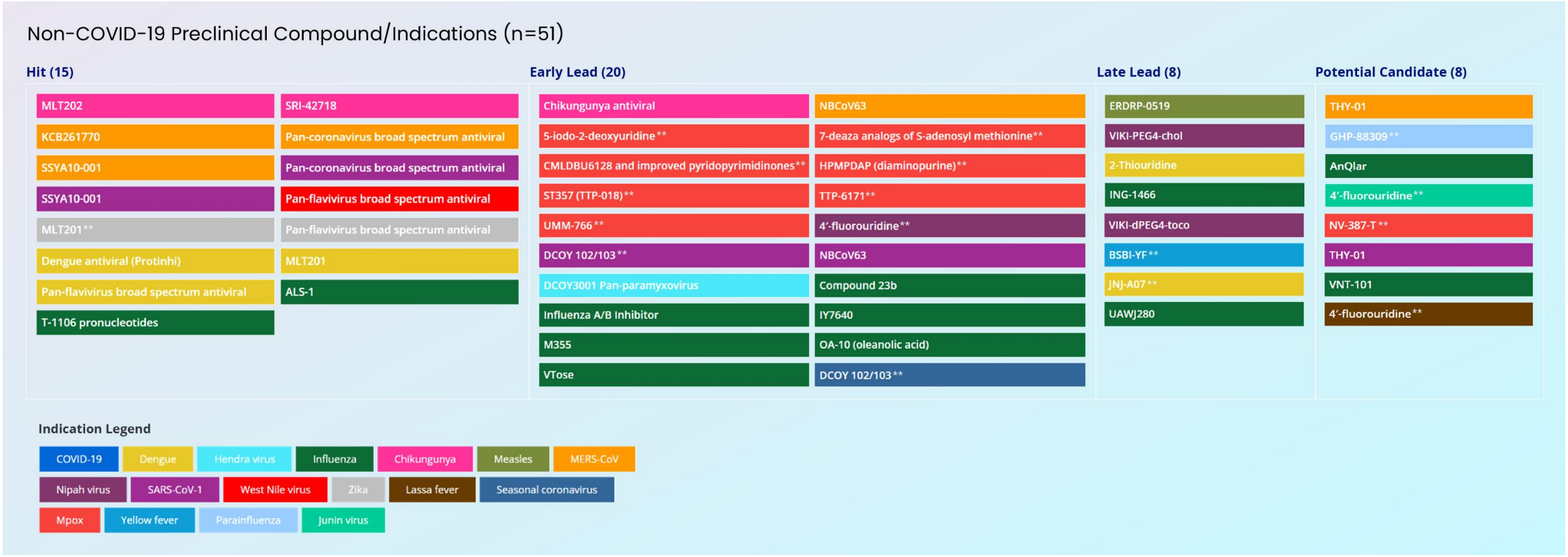
COVID-19 Preclinical Compound/Indications (n=74)

Hit (36)		Early Lead (17)		Late Lead (11)	Potential Candidate (10)
6-72-2a	Anisodamine	21i	C6G25S	2-Thiouridine	CDI-45205
AVI-8053	Borneol Ester, PROTACs	D6	EDDC-2214	Beta-521	COR803
CD04872SC	Epigallocatechin-3-gallate	EK1C4	FBP (frog-defensin-derived basic peptide)	HT-002	GC376**
H84T-BanLec	IPB02	GRL0617**	NBCoV63	LNA ASOs	P315V3
IPB19	Lycium barbarum glycopeptide	PLpro Inhibitors	RCYM002	Mpro inhibitor	SY110
MCULE-5948770040	MPI5	SBCoV202	Small molecule inhibitor	PF-07957472	CDI-873
MPI8	MRX-18	STI 4398	SWC423	3N39v4-Fc	COV-X
MXB-4	MXB-9	TDI-015051**	Therapeutic interfering particles	DCOY 102/103	NV-387-R
Napthoquinones	Pan-coronavirus broad spectrum antiviral	TNX-3500		Jun12682	RCYM003
Penciclovir	Pentosan Polysulfate			ML2006a4	THY-01
Protegrin-2	RECCE 529			MVR-V001	
RU-0415529**	SACT-Covid19				
Sangivamycin	Saquinavir				
SARS-CoV-2 PLpro Inhibitor	SBFM-PL4				
SPIKENET	Spirooxindole				
SSYA10-001	TEAR-CoV				
Urtica dioica agglutinin (UDA)	ViruSAL				
YH-6	ZINC000000639429				

*As of December 18, 2024. Archived and Discontinued compound/indications are not included in this summary; **New.

Preclinical Compounds by Stage of Preclinical Development: Non-COVID-19 Indications

For Non-COVID-19 preclinical compounds, Influenza has the highest number under evaluation (12/51, 23.5%).



*As of December 18, 2024. Archived and Discontinued compound/indications are not included in this summary; **New.

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COVID-19 & Influenza Compounds Approved by a Stringent Regulatory Authority (S.A.)*

COVID-19 (n=4), Influenza (n=8)

Compound	Developer/Sponsor	Mechanism/Target
COVID-19		
Ensitrelvir	Shionogi, Ildong	Protease - 3CL pro
Molnupiravir	Merck & Co./Merck Sharp & Dohme (MSD), Ridgeback Biotherapeutics	Replication - RdRp
Nirmatrelvir/ritonavir	Pfizer	Protease - 3CL pro
Remdesivir	Gilead Sciences	Replication - RdRp
INFLUENZA		
Amantadine	Novartis	Entry - Proton Channel M2
Baloxavir Marboxil	Shionogi, Roche	Replication - Endonuclease
Favipiravir**	FUJIFILM Toyama Chemical	Replication - RdRp
Laninamivir	Daiichi Sankyo	Assembly/Release - NA
Oseltamivir	Roche	Assembly/Release - NA
Peramivir	BioCryst Pharmaceuticals	Assembly/Release - NA
Rimantadine	Allergan	Entry - Proton Channel M2
Zanamivir	GlaxoSmithKline (GSK)	Assembly/Release - NA

*As of December 18, 2024; **Favipiravir also has an O.N.A. approval.

COVID-19 & Influenza Compounds Approved by Other National Authority (O.N.A.)*

COVID-19 (n=5), Influenza (n=0), COVID-19 & Influenza (n=3)

Compound	Developer/Sponsor	Mechanism/Target
COVID-19		
Azvudine	HeNan Sincere Biotech, Zhengzhou Granlen PharmaTech, Genuine Biotech, Fosun Pharma	Replication - RdRp
Favipiravir **	Promomed,R-Pharm	Replication - RdRp
Leritrelvir (RAY1216)	Guangdong Zhongsheng Pharmaceutical	Protease - 3CL pro
Mindeudesivir (VV116)	Shanghai Junshi Biosciences	Replication - RdRp
Simnotrelvir/ritonavir	Simcere Pharmaceutical, Shanghai Institute of Materia Medica (SIMM), Jiangsu Simcere Pharmaceutical	Protease - 3CL pro
INFLUENZA		
-	-	-
COVID-19 & INFLUENZA		
Enisamium (VR17-04)	Farmak	Replication - RdRp
Triazavirin	Medsintez Pharmaceutical	Replication - RdRp
Umifenovir	Pharmstandard	Entry - Fusion

*As of December 18, 2024; **Favipiravir also has an S.A. approval.

11 “Promising” Novel Clinical Antiviral Compounds for COVID-19 or Influenza*

COVID-19 (n=6), Influenza (n=5)

Viral Disease	Compound	Developer/Sponsor	Country	Mechanism/Target	Phase of Development
COVID-19	EDP-235	Enanta Pharmaceuticals	U.S.	Protease - 3CL pro	2
	GST-HG171/ritonavir	Fujian Cosunter Pharmaceutical	China	Protease - 3CL pro	3
	Ibuzatrelvir	Pfizer	U.S.	Protease - 3CL pro	2
	QLS1128	Qilu Pharmaceutical	China	Protease - 3CL pro	3
	SHEN26	Kexing Biopharm	China	Replication - RdRp	2
	STI-1558	Sorrento Therapeutics	U.S.	Protease - 3CL pro	3
Influenza	CD388	Cidara Therapeutics, Johnson & Johnson Innovative Medicine (JJIM)	U.S., Belgium	Entry - Fc Drug Conjugate	2
	GP681	Jiangxi Qingfeng Pharmaceutical	China	Replication - Endonuclease	3
	Onradivir	Raynovent	China	Replication - DdRp	3
	TG-1000	TaiGen Biotechnology	Taiwan	Replication - DdRp	3
	ZX-7101A	Nanjing Zenshine Pharmaceuticals	China	Replication - Endonuclease	3

*As of December 18, 2024.

20 “Watch & Wait” Novel Clinical Antiviral Compounds for COVID-19 or Influenza*

COVID-19 (n=16) of 20

Viral Disease	Compound	Developer/Sponsor	Country	Mechanism/Target	Phase of Development
COVID-19	ALG-097558	Aligos Therapeutics	U.S.	Protease - 3CL pro	1
	ASC11/Ritonavir	Ascletis Pharma	China	Protease - 3CL pro	1
	CDI-988	CoCrystal Pharma	U.S.	Protease - 3CL pro	1
	Delcetravir	Esfam Biotech	Australia	Entry - Attachment	1
	FB2001	Frontier Biotechnologies	China	Protease - 3CL pro	3
	GS-00202	Gusen Pharma	China	Protease - 3CL pro	1
	HS 10517/Ritonavir	Abbott Laboratories, AbbVie, Gilead Sciences, Jiangsu Hansoh Pharmaceutical	U.S., U.S., China	Protease - 3CL pro	2
	HY3000	Hybio Pharmaceutical (formerly Hanyu Pharmaceutical)	China	Entry - Fusion	1
	IPD-52520	IAVI	U.S.	Entry	1
	ISM3312	Insilico Medicine	Hong Kong	Protease - 3CL pro	1
	Limnetrelvir (ABBV 903)	AbbVie	U.S.	Protease - 3CL pro	1
	NV-387	NanoViricides	U.S.	Entry - Attachment	1
	RQ-01	Red Queen Therapeutics	U.S.	Entry	1
	S-892216	Shionogi	Japan	Protease - 3CL pro	1
	WPV01	Westlake University	China	Protease - 3CL pro	3
	YKYY017	Yuekang Pharmaceutical	China	Entry - Fusion	3

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20 “Watch & Wait” Novel Clinical Antiviral Compounds for COVID-19 or Influenza*

Influenza (n=4) of 20

Viral Disease	Compound	Developer/Sponsor	Country	Mechanism/Target	Phase of Development
Influenza	AV5080	Viriom	Russia	Assembly/Release - NA	2
Influenza	CC-42344	CoCrystal Pharma	U.S.	Replication - Flu A Pol	2
Influenza	HNC042	Guangzhou Henovcom Bioscience Co. Ltd.	China	Assembly/Release - NA	2
Influenza	TRX100 (AV5124)	Traws Pharma	U.S.	Replication - Endonuclease	1

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Preclinical Compounds for COVID-19 (n=21)*

Potential Candidates (n=10), Late Leads (n=11)

Phase of Development	Viral Disease	Compound	Developer/Sponsor	Country	Mechanism/Target
Potential candidate	COVID-19	CDI-45205	CoCrystal Pharma	U.S.	Protease - 3CL pro
		CDI-873	CoCrystal Pharma	U.S.	Protease - 3CL pro
		COR803	Quince Therapeutics (formerly Cortexyme)	U.S.	Protease - 3CL pro
		COV-X	Infex Therapeutics	U.K.	Protease - PL pro
		GC376	Anivive Lifesciences	U.S.	Protease - 3CL pro
		NV-387-R	NanoViricides	U.S.	Entry
		P315V3	Institute of Microbiology of the Chinese Academy of Sciences	China	Entry - Fusion
		RCYM003	Raynovent	China	Protease - 3CL pro
		SY110	Sichuan University	China	Protease - 3CL pro
		THY-01	Thylacine Biotherapeutics Inc.	U.S.	Entry - Fusion
Late lead	COVID-19	2-Thiouridine	Hokkaido University	Japan	Replication - RdRp
		3N39v4-Fc	Juntendo University	Japan	Entry - Spike
		Beta-521	Benevira	U.S.	Entry
		DCOY 102/103	Decoy Therapeutics	U.S.	Entry - Decoy
		HT-002	Hoth Therapeutics	U.S.	Entry
		Jun12682	Rutgers University	U.S.	Protease - PL pro
		LNA ASOs	University of California Berkeley	U.S.	Replication -RNA
		ML2006a4	Stanford University	U.S.	Protease - 3CL pro
		Mpro inhibitor	Exscientia	U.K.	Protease - 3CL pro
		MVR-V001	MVRIX	South Korea	Entry - Decoy
		PF-07957472	Pfizer	U.S.	Protease - PL pro

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Preclinical Compounds for Influenza (n=4)*

Potential Candidates (n=2), Late Leads (n=2)

Phase of Development	Viral Disease	Compound	Developer/Sponsor	Country	Mechanism/Target
Potential Candidate	Influenza	AnQlar	Virpax Pharmaceuticals	U.S.	Entry
		VNT-101	Via Nova Therapeutics	U.S.	Replication
Late Lead	Influenza	ING-1466	University of Illinois at Chicago, Chicago BioSolutions	U.S.	Entry - Flu HA
		UAWJ280	University of Georgia, University of Arizona	U.S., U.S.	Entry - Flu M2

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Archived Compounds for COVID-19*

Clinical (n=1), Preclinical (n=18)

Phase of Development	Viral Disease	Compound	Developer/Sponsor	Country	Mechanism/Target
Clinical	COVID-19	WPV01/ritonavir	Westlake University	China	Protease - 3CL pro
Preclinical	COVID-19	4'-Fluorouridine	Georgia State Univ., Emory Univ., Texas Biomed. Res. Inst.	U.S., U.S., U.S.	Replication - RdRp
		AB-343	Arbutus Biopharma	U.S.	Protease - 3CL pro
		Antisense Oligonucleotides	Sarepta Therapeutics	U.S.	Viral RNA
		ATV006	Guangdong Provincial Center for Disease Control and Prevention	China	Replication - RdRp
		GDI-4405	Jiangsu Hansoh Pharmaceutical	China	Protease - 3CL pro
		GS-621763	Gilead Sciences	U.S.	Replication - RdRp
		GS-6620	Gilead Sciences	U.S.	Protease - 3CL pro
		Oral nsp12 inhibitor	Arbutus Biopharma	U.S.	Replication - RdRp
		PF-00835231	Pfizer	U.S.	Protease - 3CL pro
		1KJ0-7	Shahid Chamran University	Iran	Protease - 3CL pro
		2ERW-9	Shahid Chamran University	Iran	Protease - 3CL pro
		Ab001	Agastiya Biotech	U.S.	Entry - ACE2; Replication - NSP15
		Bananin	Medsintez Pharmaceutical	Russia	NSP13 helicase
		chromone-4c	Pritzker School of Molecular Engineering	U.S.	NSP13 helicase
		Coumarin-EM04	Sambalpur University	India	Protease - 3CL pro
		LMed-052	State University of Londrina, Federal University of Rio de Janeiro (UFRJ)	Brazil	Replication - RdRp
		LMed-087	State University of Londrina, Federal University of Rio de Janeiro (UFRJ)	Brazil	Replication - RdRp
		Monomethylated Triazolopyrimidine	University of Hyderabad, National Institute of Animal Biotechnology	India	Replication - RdRp

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Archived Compounds for Influenza*

Clinical (n=0), Preclinical (n=4)

Phase of Development	Viral Disease	Compound	Developer/Sponsor	Country	Mechanism/Target
Preclinical	Influenza	CD-SA cyclodextrin	University of Geneva	Switzerland	Entry - Viral Envelope
		Oral FluCide	NanoViricides	U.S.	Not yet confirmed
		STP-702	SirnaOmics	U.S.	Replication - siRNA
		Tamiphosphor	TaiMed Biologics	Taiwan	Assembly/Release - NA

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Discontinued Clinical Compounds for COVID-19 or Influenza*

COVID-19 (n=5), Influenza (n=3)

Phase of Development	Viral Disease	Compound	Developer/Sponsor	Country	Mechanism/Target
Clinical	COVID-19	Bemnifosbuvir	Atea Pharmaceuticals	U.S.	Replication - RdRp
		BIT-225	Biotron	Australia	Assembly/Release
		Galidesivir	BioCryst Pharmaceuticals, NIAID	U.S., U.S.	Replication - RdRp
		Obeldesivir	Gilead Sciences	U.S.	Replication - RdRp
		Valganciclovir	Roche	Switzerland	Replication - DNA pol
	Influenza	AL-794	Johnson & Johnson Innovative Med.	Belgium	Replication - Endonuclease
		Flufirvitide-3	Autoimmune Technologies	U.S.	Entry - Flu HA
		Radavirsen	Sarepta Therapeutics	U.S.	Replication - Translation

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Discontinued Preclinical Compounds for COVID-19 or Influenza*

COVID-19 (n=1), Influenza (n=0)

Phase of Development	Viral Disease	Compound	Developer/Sponsor	Country	Mechanism/Target
Preclinical	COVID-19	ISM036-076 PCC	Insilico Medicine	Hong Kong	Protease - 3CL pro

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