# CORBUS PHARMACEUTICALS

#### PIONEERING TRANSFORMATIVE MEDICINES THAT TARGET THE ENDOCANNABINOID SYSTEM

NASDAQ: CRBP | corbuspharma.com | @corbuspharma



This presentation contains certain forward-looking statements within the meaning of Section 27A of the Securities Act of 1933 and Section 21E of the Securities Exchange Act of 1934 and Private Securities Litigation Reform Act, as amended, including those relating to the Company's restructuring, trial results, product development, clinical and regulatory timelines, market opportunity, competitive position, possible or assumed future results of operations, business strategies, potential growth opportunities and other statements that are predictive in nature. These forward-looking statements are based on current expectations, estimates, forecasts and projections about the industry and markets in which we operate and management's current beliefs and assumptions. These statements may be identified by the use of forward-looking expressions, including, but not limited to, "expect," "anticipate," "intend," "plan," "believe," "estimate," "potential," "predict," "project," "should," "would" and similar expressions and the negatives of those terms. These statements relate to future events or our financial performance and involve known and unknown risks, uncertainties, and other factors, including the potential impact of the recent COVID-19 pandemic and the potential impact of sustained social distancing efforts, on our operations, clinical development plans and timelines, which may cause actual results, performance or achievements to be materially different from any future results, performance or achievements expressed or implied by the forward-looking statements. Such factors include those set forth in the Company's filings with the Securities and Exchange Commission. Prospective investors are cautioned not to place undue reliance on such forward-looking statements, which speak only as of the date of this press release. The Company undertakes no obligation to publicly update any forward-looking statement, whether as a result of new information, future events or otherwise.

### FORWARD-LOOKING STATEMENTS

## Corbus at a glance



Targeting the endocannabinoid system



Focusing on inflammatory and fibrotic diseases



Key catalysts expected over next 6 months



Large markets with significant unmet needs

Ticker CRBP

Founded in 2014

75 Employees

VITAL STATS

Based in Norwood, MA

\$305M Capital raised to date

~ \$ 4 5 M Additional awards and grants from NIH and CFF

\$27M Upfront payment from Kaken Pharmaceuticals collaboration

## Corbus pipeline: early- and late-stage programs



\*Topline results from RESOLVE-1 systemic sclerosis study and Phase 2b study in CF showed no significant differences in the primary endpoint when comparing lenabasum to placebo, both added to background drug therapy. Corbus is currently reviewing the complete dataset to be presented at an upcoming scientific conference and is evaluating all strategic options \*\* Library includes 1,000+ NCEs.

Lenabasum is not approved for the treatment of systemic sclerosis, dermatomyositis, cystic fibrosis or systemic lupus erythematosus.

# What is the Endocannabinoid System (ECS)?



2 related GPCRs CB1 and CB2



2 endogenous agonists Anandamide & 2-AG



Metabolic enzymes FAAH and MAGL





- Inhibit generation of second messengers cAMP and intracellular Ca++ through effects on adenylate cyclase and ion channels
- Effects on multiple intracellular signaling molecules/pathways, including but not limited to NFkB
- Subsequent effects on gene transcription, protein synthesis

## Growing recognition of therapeutic potential of targeting the ECS

COMPANY	DRUG CANDIDATE	PHASE	TARGET	TYPE OF COMPOUND
CORBUS	Lenabasum (CB2 agonist)	Phase 3 in SSc completed* Phase 2b in CF completed* Phase 3 in DM ongoing Phase 2 SLE ongoing	SSc, DM, CF & SLE	Small molecule (NCE)
Roche	RO6871304 (CB2 agonist)	Preclinical	Uveitis	Small molecule (NCE)
Goldfinch Bio Takeda	GFB-024 (CB1 antagonist)	Preclinical (Phase 1 planned 2H 2020)	Diabetic kidney disease	Monoclonal antibody (mAb)
	INV-101 (CB1 Inverse agonist)	Preclinical	Prader-Willi Syndrome; Non-alcoholic steatohepatitis	Small molecule (NCE)
Janssen - falenes-falenes	Nimacimab (CB1 antagonist)	Phase 1 completed	NAFLD & diabetes or pre-diabetes	Monoclonal antibody (mAb)
Janssen	JNJ-42165279 (FAAH inhib)	Phase 2	Autism Spectrum Disorder & Social Anxiety Disorders	Small molecule (NCE)
Janssen	JNJ-42226314 (MAGL inhib)	Preclinical	Potential therapeutic application in several CNS disorders, neuropathic and inflammatory pain	Small molecule (NCE)
Lundbeck X ABIDE W	ABX-1431 (MGLL inhib)	Phase 2, Acquired by H. Lundbeck A/S	Tourette's syndrome	Small molecule (NCE)
Pharmaceuterals International. Inc.	Cesamet (nabilone) (THC)	Commercial	Nausea & Vomiting Associated with Cancer Chemotherapy	Phytocannabinoid
abbvie	Marinol® (THC)	Commercial	Anorexia Associated with Weight Loss in Patients with AIDS, Nausea & Vomiting Associated with Cancer Chemotherapy	Phytocannabinoid
pharmaceuticals	Epidiolex® (CBD)	Commercial	Various rare forms of epilepsy	Phytocannabinoid
phermaceuticals	Sativex <sup>®</sup> (CBD & THC)	Commercial in EU	Symptomatic Relief of Spasticity in MS	Phytocannabinoid

\*Topline results from the Phase 3 study in systemic sclerosis and Phase 2b study in cystic fibrosis showed no significant differences in the primary endpoint when comparing lenabasum to placebo, both added to background drug therapy. Corbus is currently reviewing the complete dataset and evaluating all strategic options.

# Target indications across major markets provide commercialization opportunities





#### JAPAN PARTNERSHIP Kaken Pharmaceuticals

- Exclusive licensing agreement for SSc and DM lenabasum indications in Japan
- Up-front \$27M payment and up to \$173M of potential milestone payments
- Double-digit royalty payments

1: Health Advances, LLC, Lenabasum Commercial Market Assessment, North America Includes Canada and Mexico; 2: Rheumatology, Ru Li, Jian Sun, et al. (2012)

## LENABASUM

#### Lenabasum MOA: CB2 agonist designed to provide an alternative to immunosuppressive treatments for chronic inflammatory and fibrotic diseases

- Oral agonist of cannabinoid receptor type 2 (CB2), a GPCR that regulates inflammation and fibrosis
- Designed as a disease-modifying alternative to immunosuppressive treatments for chronic inflammatory and fibrotic diseases
- Has effects on immune cells and fibroblasts, both of which express CB2 when activated
- Reduces inflammatory cells and cytokines in tissue
- Reduces myofibroblasts and pro-fibrotic growth
  factors in tissue
- IP until 2034



#### Lenabasum properties

#### • MW 400 Da

- Ki = 54 nM for CB2 vs. 680 nM for CB1
- 30% blood-brain barrier penetration further reduces potential CB1-mediated CNS AEs
- Oral administration,  $T_{max}$  2.5 4 hours,  $T_{\frac{1}{2}}$  3-5 hours, longer biologic half-life
- Metabolized mainly in liver, ~2/3 fecal and ~1/3 renal excretion
- MTD: 180 mg total daily dose
- DLT: 240 mg: multiple mild or moderate AEs including dizziness, fatigue, nausea, vomiting, and unusual feelings



Closed circles = single doses, fasted; open circles, single doses fed; squares = multiple doses; open square = multiple doses in subjects  $\geq$  65 years of age

#### Lenabasum pharmacodynamics: Human *E.coli* Blister Model



Motwani et al. Clin Pharmacol Ther. 2017 Dec 14. doi: 10.1002

## Biologic activity of lenabasum in patients with targeted diseases

#### Systemic Sclerosis



#### Decreased expression of relevant genes



#### Dermatomyositis



## Co-localization of CD4, CB2, IFN $\gamma$ staining in skin

Increased expression of CB2 in DM lesional skin compared to normal skin

#### Cystic Fibrosis

Reduction in inflammatory markers in lung sputum

#### Reduction with lenabasum 20 mg BID compared to placebo ( $Log_{10}$ )



# Lenabasum treatment reduced CD4 and CB2 expression in lesional skin from DM subjects in Phase 2



\*CD4 and CB2 expression were significantly decreased at week 12 versus baseline, p < 0.05, in paired biopsies of lesional skin from lenabasumtreated subjects, but not paired skin biopsies from placebo-treated subjects from the Phase 2 study of lenabasum in subjects with dermatomyositis. Source: Chen, ACR Abstract 2018 Lenabasum treatment reduced Interleukin-1 $\beta$  and Interferon  $\gamma$  expression in lesional skin from DM subjects in Phase 2



\*IL-1β and IFNγ B2 expression were significantly decreased at week 12 versus baseline, p < 0.05, in paired biopsies of lesional skin from lenabasum-treated subjects, but not paired skin biopsies from placebo-treated subjects from the Phase 2 study of lenabasum in subjects with dermatomyositis. Source: Chen, ACR Abstract 2018

# Lenabasum inhibits $\mathsf{IFN}\alpha$ gene and protein expression by cultured PBMC from SLE patients





PBMC from a patient with SLE were stimulated *ex vivo* with CpG DNA and exposed to increasing concentrations of lenabasum. IFNα gene expression was measured using RT-PCR.

PBMC from five SLE patients stimulated with CpG DNA ± lenabasum. \* p < 0.0001 versus no lenabasum. Lenabasum has an acceptable safety profile and is well tolerated based on data to date

- The majority of adverse reactions observed in clinical studies conducted to date are mild or moderate
- Most common adverse events thought to be related to lenabasum are dizziness, dry mouth, and fatigue, which are consistent with expected class effects
- Minimal changes from baseline in vital signs and laboratory safety tests and changes similar to those seen with placebo
- Safety data in blinded clinical studies are consistent with that observed in unblinded studies (n > 1,000)

LENABASUM SAFETY OVERVIEW

## SYSTEMIC SCLEROSIS

Systemic sclerosis is a rare, debilitating and life-threatening autoimmune disease characterized by inflammation & fibrosis





1. Furst. J Rheumatol. 2012, Aurore Bergamasco et al., Clin Epidemiol, 2019 & Health Advances, LLC Corbus Commercial Assessment Patient Images provided by the Scleroderma Foundation

#### Physicians are most concerned with lung involvement in SSc

Rheumatologists rank pulmonary disorders as the most strongly associated and highly concerning of SSc specific symptoms...



...they are also most familiar with, and find most important, forced vital capacity (FVC) as an SSc endpoint



"How severe is the organ-system involvement, that is the crucial issue, GI and lung. Lung is the biggest concern."

US Community Rheumatologist\*

Source: Corbus SSc ATU Study, March 2020 (n = 100 US Rheumatologists)

\* Quote from proprietary qualitative market research conducted in H2 2019 (n = 20 U.S. Rheumatologists)

### RESOLVE-1 Phase 3 in SSc

Largest ever study in dcSSc (n=365, 52-weeks, 76 global sites)

First in a group of studies to allow patients to remain on background immunosuppressant therapy (IST)

#### RESULTS

Study did not meet primary endpoint

#### **KEY LEARNINGS**

Underappreciated benefit from IST (especially in newly diagnosed patients) led to much higher improvement in the control group than anticipated PRIMARY EFFICACY ENDPOINT: median ACR CRISS scores at Week 52

	Lenabasum 20 mg BID N = 120	Lenabasum 5 mg BID N = 120	Placebo N = 123
Visit 11 (Week 52)			
n	100	113	115
Mean (SD)	0.598 (0.432)	0.575 (0.423)	0.636 (0.422)
Median (Q1, Q3)	0.888 (0.061, 0.997)	0.827 (0.070, 0.988)	0.887 (0.071, 0.999)
p-value - Ranked Score, MMRM	0.497	0.349	

There were also no significant differences among treatment groups for the secondary efficacy outcomes.

**NEXT STEPS:** Further data analysis, consider design of next Phase 3 study

mITT population, primary efficacy analysis. MMRM with imputed values for missing core items, except LOCF for core items missing because of COVID-19.

Phase 3 | Subjects treated with lenabasum 20 mg BID added to established IST (> 2 years duration) had stable FVC % predicted

### Post-hoc analyses

Subjects treated with lenabasum 20 mg BID added to established immunosuppressant therapies (IST) had stable FVC % predicted over 1 year



IST = immunosuppressant therapies. Post-hoc analyses, per protocol population of subjects who completed study drug and Week 52, LOCF for any missing values. Subjects were receiving at least 1 background IST for greater than 2 years treatment duration at baseline, and any MMF treatment must be > 2 years duration

# Phase 3 | Subjects treated with lenabasum 20 mg BID added to established IST had stable FVC % predicted over 1 year

Change in FVC % predicted

### Post-hoc analyses

Subjects had more stable lung function (FVC, % predicted) over 1 year when lenabasum 20 mg BID was added to established immunosuppressive therapies, compared to subjects treated with placebo



Change in mean FVC % predicted,

IST = immunosuppressant therapies. Post-hoc analyses, per protocol population of subjects who completed study drug and Week 52, LOCF for any missing values. Subjects were receiving at least 1 background IST for greater than 2 years treatment duration at baseline, and any MMF treatment must be > 2 years duration

Phase 3 | Subjects treated with lenabasum 20 mg BID added to established IST had less decline and more stability in FVC % predicted

### Post-hoc analyses

A lower proportion of subjects treated with lenabasum 20 mg BID added to established immunosuppressive therapies had worsening lung function and a higher proportion had stable lung function, compared to subjects treated with placebo



IST = immunosuppressant therapies. Post-hoc analyses, per protocol population of subjects who completed study drug and Week 52, LOCF for any missing values. Subjects were receiving at least 1 background IST for greater than 2 years treatment duration at baseline, and any MMF treatment must be > 2 years duration

## DERMATOMYOSITIS

24











Dermatomyositis (DM) and systemic sclerosis are related rare systemic autoimmune diseases

- DM is a rare and life-threatening autoimmune disease characterized by skin and muscle inflammation
- 30% mortality in 5 years<sup>1</sup>
- Standard of care: immunosuppressive therapies with potential for significant toxicity

Images provided by Myositis Support and Understanding and The Myositis Association; 1: Schiopu et al, 2012

## Phase 2 | Improvement in skin activity



- Subjects had moderate to severe skin disease refractory to immunosuppressive treatment
- CDASI activity score measures active disease in the skin
- Favorable safety profile persists in OLE
- Durable efficacy in OLE
- 90% persistence in OLE at 2 years
- Reduction of 4 points at 12 months is associated with improvement in skin-related quality of life outcomes, itch and pain<sup>1</sup>

1 Week 0 DBPC CDASI activity score mean (SD) = 33.3 (9.74) for lenabasum and 35.8 (7.77) for placebo.  $P^* = 0.09$ , p = 0.05, p = 0.28, p = 0.04, for lenabasum vs. placebo at Weeks 4, 8, 12, and 16, respectively, of DBPC Part A of study, MMRM, 2-sided; 1: Robinson et al. Br J Dermatol. 2015;172:169

## Ongoing Phase 3 <u>DETERMINE</u> study

- Baseline characteristics of subjects are similar to those in the Phase 2 study
- Enrollment complete
- Topline results expected Q2 2021

DOUBLE-BLIND, RANDOMIZED, PLACEBO-CONTROLLED STUDY



MULTINATIONAL

) 176 SUBJECTS



#### PRIMARY ENDPOINT IN U.S. & EU:

American College of
 Rheumatology (ACR) / European
 League Against Rheumatism
 (EULAR) 2016 Total Improvement
 Score (TIS) in Adult
 Dermatomyositis & Polymyositis

#### SECONDARY ENDPOINTS

- Mean MMT-8 Score
- CDASI activity score
- Investigator Global Assessment scale of skin activity
- Short Form-36 physical functioning domain score
- Corticosteroid dose
- FVC % predicted

Orphan Drug Designation from FDA and EMA

FD/A

EUROPEAN MEDICINES AGENCY

## Phase 3 | Baseline immunosuppressant treatments

Baseline characteristics	Any use	Use ≤ 1 year	Use > 1 year
Any	86%	19%	67%
Steroids	55%	20%	35%
IVIg	15%	5%	11%
Mycophenolate	19%	8%	11%
IVIg or mycophenolate	31%	11%	20%
Methotrexate	26%	7%	18%
Hydroxychloroquine	21%	5%	17%
Other (azathioprine rituximab, tacrolimus, cyclosporine)	30%	8%	22%

### A new outcome for DM studies: Total Improvement Score (TIS)

- Composite score of categories of improvement from baseline
- Range 0 100. Higher score = more improvement. 100 ≠ normal
- Maximum possible TIS score in an individual depends on degree of abnormality in each core set item at baseline
- Based on weighted categories of improvement in 6 core measures
  - Physician assessments, max = 72.5 points
  - Patient assessments, max = 20 points
  - Biomarker assessment of muscles, max = 7.5 points

Core set measure	Level of improvement	Level score
	Worsening to improvement	0
	>5% to 15% to improvement	7.5
Physician Global Activity	>15% to 25% to improvement	15
Activity	>25% to 40% to improvement	17.5
	>40% improvement	20

## SLE

Ongoing systemic lupus erythematosus Phase 2 study funded and run by National Institutes of Health

• Enrollment expected to complete in the first half of 2021

DOUBLE-BLIND, RANDOMIZED, PLACEBO-CONTROLLED STUDY



15 SITES IN U.S.

~100 SUBJECTS



#### PRIMARY ENDPOINT IN U.S.:

 Change from baseline in the 7-Day Average of the Maximum Daily Numeric Rating Scale for Pain (NRS-Pain) Score

#### SECONDARY ENDPOINTS

- BILAG-2004
- SELENA-SLEDAI Score
- SELENA-SLEDAI Flare Index
- Patient Global Assessment
- PROMIS-29
- SLE Responder Index
- Swollen or Tender Joint Count

## CYSTIC FIBROSIS

Despite advances in CF treatment, a large percentage of CF patients experience pulmonary exacerbations (PEx)

- Vast majority of treatment occurs in one of 130 CF Care Centers, including 33 Corbus sites
- Decline in percentage of patients experiencing PEx-IV has been modest despite introduction of CFTR modulators
- On average, patients spend nearly 18 days hospitalized for PEx per year
- Even with latest approval, 10% of CF patients remain ineligible for a CFTR modulator



### Phase 2b in CF

One of largest ever studies in CF	PRIMARY EFFICACY ENDPOINT: Event rate of new PEx per subject per 28 weeks			
(n=416, 28 weeks, 105 global sites)		PE	Ex Rate per Subject p	er 28 Weeks
First study to focus on patients who	PEx Definitions	Placebo	Lenabasum 5 mg	Lenabasum 20 mg
frequently exacerbate hence higher morbidity than other CF studies		N = 171	N = 89	N = 165
<b>RESULTS</b> Study did not meet primary endpoint	Primary PEx definition	0.85	0.76	0.90
	Primary PEx definition, IV Abx	0.47	0.41	0.46
KEY LEARNINGS	Secondary PEx definition	1.02	0.92	1.04
Observed PEx rates in 5 eastern European countries were 1/10th of those seen in U.S., Canada and rest of EU skewed power assumptions	Secondary PEx definition, IV Abx	0.55	0.48	0.53
	NEXT STEPS: Further analysis of	of the data i	s underway.	

## PEx rates in placebo group by baseline characteristic

Characteristic, N = 133	Rate	Characteristic, N = 133	Rate
All	1.05	CFTR-modulators, $n = 46$	0.97
FEV1 < 70%, n = 102	1.12	No CFTR-modulators, n = 87	1.09
1 2 1 4 1 6 70, 11 - 102	1.12	Azithromycin, n = 65	1.02
FEV1 ≥ 70%-<90%, n = 23	0.98	No azithromycin, n = 68	1.06
FEV1 ≥ 90%, n = 8	0.39	Pseudomonas in sputum, n = 82	1.12
2 PEx last year, n = 56	0.76	Staph in sputum, n = 30	1.07
		No pseudomonas or staph, n =21	0.81
3 PEx last year, n = 52	1.23	Inhaled prophylactic ABx, $n = 72$	0.99
4-7 PEx last year, n = 24	1.35	No inhal. prophylactic ABx, n= 61	1.12

Excludes subjects in 5 "low PEx rate" Eastern European countries Preliminary data analyses

#### Post-hoc analyses of PEx rate by FEV1 and CFTR-modulator use

	N M		PEx rate per Subject per 28 Weeks			
Treatment		CFTR Modulators	Primary PEx definition	Primary PEx definition IV ABx	Secondary PEx definition	Secondary PEx definition IV ABx
FEV1 % predicted ≥ 40 to < 70%						
Placebo	61		1.21	0.64	1.45	0.71
Lenabasum 5 mg	31	No	0.80 (34% RR)	0.47 (27% RR)	0.84 (42% RR)	0.49 (31% RR)
Lenabasum 20 mg	49		1.08	0.56	1.30	0.67
Placebo	30		0.96	0.67	1.10	0.78
Lenabasum 5 mg	12	Yes	0.66 (31% RR)	0.41 (39% RR)	0.74 (33% RR)	0.49 (37% RR)
Lenabasum 20 mg	30		1.05	0.56	1.22	0.70

### A team with proven record of execution



Yuval Cohen, PhD Chief Executive Officer, Director Executive leadership experience in inflammatory disease drug development



Sean Moran, CPA, MBA Chief Financial Officer Senior financial experience with emerging biotechnology, drug delivery and medical device companies



#### Craig Millian, MBA Chief Commercial Officer

Experience leading commercial organizations and building successful brands at multiple biopharma companies



Barbara White, MD Chief Medical Officer and Head of Research

Previous academician with industry, clinical development, and medical affairs experience in inflammatory and autoimmune diseases



Ross Lobell VP, Regulatory Affairs Regulatory affairs experience with an extensive biopharmaceutical background in leading preclinical, clinical and nonclinical regulatory strategies



Dylan Wenke Director, Business Development Experience leading corporate development, partnerships, and collaborations at pharmaceutical and venture-backed startups



### Experienced and engaged board of directors



Amb. Alan Holmer Ret. Chairman of the Board More than two decades of public service in Washington, D.C. including Special Envoy to China; Former CEO of PhRMA



Avery W. (Chip) Catlin Director More than 25 years of senior financial leadership experience in life science companies; Former CFO and Secretary of Celldex Therapeutics



Yuval Cohen, PhD Chief Executive Officer, Director More than 13 years of executive leadership experience in inflammatory disease drug development



Rachelle Jacques
Director

More than 25-year professional career, experience in U.S. and global biopharmaceutical commercial leadership, including multiple highprofile product launches in rare diseases; CEO of Enzyvant Therapeutics



John K. Jenkins, MD Director

Distinguished 25-year career serving at the U.S. FDA, including 15 years of senior leadership in CDER and OND



Pete Salzmann, MD, MBA Director

20 years of industry experience and currently serves as Chief Executive Officer of Immunovant (NASDAQ: IMVT), a biopharmaceutical company focused on developing therapies for patients with autoimmune diseases



### Financial profile: CRBP(NASDAQ)

#### \$305M CAPITAL RAISED TO-DATE

\$45M NON-DILUTIVE FUNDING FROM NIH AND CF FOUNDATION<sup>1</sup> 81.7M common shares outstanding (99.1M fully diluted)

~\$82M CASH BALANCE AS OF 9/30/2020

\$116M market cap<sup>2</sup>

1: Includes development award from CFF announced in January 2018 which provides up to \$25m in funding; 2: Based on November 12, 2020 closing price of \$1.38 per share

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## APPENDIX

## Lenabasum In Vitro Profiling Differentiates it from Anti-Inflammatory Disease Modifying Compounds



**Discover**X BioMAP<sup>®</sup> system measures effect on human cellular functions