

# Leading Expert Webinar on Plinabulin for the Prevention of Severe Chemotherapy-Induced Neutropenia (CIN)

March 2021 | NASDAQ: BYSI

### **Disclaimer – Forward Looking Statements**

This presentation has been prepared for informational purposes only. No money or other consideration is being solicited, and if sent in response, will not be accepted. This presentation shall not constitute an offer to sell, or the solicitation of an offer to buy, any securities, nor shall there be any sale of these securities in any state or jurisdiction in which such offer, solicitation or sale would be unlawful prior to registration or qualification under the securities laws of any such state or jurisdiction. The Company is not under any obligation to make an offering. It may choose to make an offering to some, but not all, of the people who indicate an interest in investing. The information included in any registration statement will be more complete than the information the Company is providing now, and could differ in important ways.

This presentation and any accompanying oral commentary contain forward-looking statements about BeyondSpring Inc. ("BeyondSpring" or the "Company"). Forward- looking statements are based on our management's beliefs and assumptions and on information currently available to our management, including those described in the forward-looking statements and risk factors sections of the Company's 20-F filed on April 30, 2020 and other filings with the United States Securities and Exchange Commission (SEC).

Such statements are subject to known and unknown risks, uncertainties, and other factors that may cause our or our industry's actual results, levels of activity, performance, or achievements to be materially different from those anticipated by such statements. In some cases, you can identify forward-looking statements by terminology such as "may," "will," "should," "expects," "plans," "anticipates," "believes," "estimates," "predicts," "potential," "intends," or "continue," or the negative of these terms or other comparable terminology. Forward-looking statements contained in this presentation include, but are not limited to, (i) statements regarding the timing of anticipated clinical trials for our product candidates and our research and development programs; (ii) the timing of receipt of clinical data for our product candidates; (iii) our expectations regarding the potential safety, efficacy, or clinical utility of our product candidates; (iv) the size of patient populations targeted by our product candidates and market adoption of our product candidates by physicians and patients; and (v) the timing or likelihood of regulatory filings and approvals.

Except as required by law, we assume no obligation to update these forward-looking statements publicly, or to update the reasons why actual results could differ materially from those anticipated in the forward-looking statements, even if new information becomes available in the future.

The market data and certain other statistical information used throughout this presentation are based on independent industry publications, governmental publications, reports by market research firms or other independent sources. Some data are also based on our good faith estimates. Although we believe these third-party sources are reliable, we have not independently verified the information attributed to these third-party sources and cannot guarantee its accuracy and completeness. Similarly, our estimates have not been verified by any independent source.

By attending this presentation, you acknowledge that you will be solely responsible for your own assessment of the market and our market position and that you will conduct your own analysis and be solely responsible for forming your own view of the potential future performance of our business.



### Agenda



# 10:00 a.m.IntroductionLan Huang, Ph.D., CEO and co-founder of BeyondSpring Inc.

10:05 a.m.Unmet medical need and current treatment landscape in CINJeffrey Vacirca, M.D., F.A.C.P. New York Cancer & Blood Specialists

10:20 a.m.Clinical trials, what is the solution?Douglas Blayney, M.D., Stanford University

10:35 a.m. Live Q&A

11:00 a.m.Closing RemarksLan Huang, Ph.D., CEO and co-founder of BeyondSpring Inc.

# **BeyondSpring: Key Highlights**

### Mission

Committed to raising the standard of care for cancer patients in the largest global markets with first-in-class treatments that improve lives and clinical outcomes for millions of patients in need

### 2 near-term NDAs Global Market Opportunities

### PLINABULIN: Raising SOC in CIN & NSCLC

- First-in-Class immune agent
- ✓ New Chemical Entity
- ✓ IP through 2036 in 36 jurisdictions

### CIN: Combo with G-CSF

- Positive Ph 3 topline data Nov 2020
- NDA submission 1Q 2021
- 🗸 Market: \$4.5B (US)
- Breakthrough Designation (US, China)

### NSCLC: Combo with docetaxel

- Final Ph 3 topline data 1H2021
- Early 2022 NDA submission
- \$30B+ global market

### **Broad Pipeline**

### PLINABULIN: A pipeline in a drug

- Triple combo w/IO agents and radiation/chemo
- Expansion to additional solid tumors

### Targeted Protein Degradation Platform

- Seed Therapeutics (Subsidiary)
- Collaboration with Eli Lilly

### **Three Pre-Clinical IO Agents**

### Global Capabilities Continuous Innovation

### Strong clinical development

- Enrolled 1,000+ patients to final filing stage for CIN and NSCLC
- Dual U.S. and China development strategy
- ✓ Strong clinical investigator network

### Deep Regulatory Expertise

**Commercialization Planning Underway** 

# **Two Near-term NDAs & Robust Drug Development Pipeline**

	Indication / Target	Program	Trial name / collaborator	Preclinical	Phase 1	Phase 2	Phase 3	Commercial rights	Status/Next Milestone
Late stage	CIN (All cancer, all chemo)	Plinabulin + pegfilgrastim	PROTECTIVE-1 & PROTECTIVE-2	Phase 3 primary en	idpoint met in pivotal da	ata announced Noven	nber 2020	Global <sup>1</sup>	China NDA Submission Q1 2021 U.S. NDA Submission Q1 2021
	NSCLC (2 <sup>nd</sup> /3 <sup>rd</sup> line)	Plinabulin + docetaxel	DUBLIN-3	Phase 3 second inte	erim analysis completec			Global <sup>1</sup>	Global Final topline Ph3 data H1 2021
ombo IO T)	SCLC	Plinabulin + nivolumab + ipilimumab	Rutgers University					Global <sup>1</sup>	Ongoing
Triple Co (IIT	Multi-cancer (2 <sup>nd</sup> /3 <sup>rd</sup> line)	Plinabulin + PD-1/PD-L1 + radiation/chemo	MD Anderson					Global <sup>1</sup>	Initiate Phase 1 in 7 cancers <b>Q1 2021</b>
Investigator-initiated IO	Oral T cell co-stimulator	BPI-002						Global	
	IKK inhibitor	BPI-003						Global	
	Oral neo-antigen generator	BPI-004						Global	
Subsid diary	KRAS and additional targets	Targeted Protein degradation (TPD, molecular glue)	Seed Therapeutics					Global	Potential additional partnerships
ibsid iary	3x targets		4.00 ·					Global	\$800M collaboration

**BeyondSpring** 

Note: Global rights to Plinabulin ex-China. 58% ownership of Chinese subsidiary, Dalian Wanchunbulin Pharmaceuticals Ltd., which owns Chinese rights to Plinabulin. Seed Therapeutics is a subsidiary of BeyondSpring Group. BeyondSpring Inc. owns 100% of global rights

Till

### **Leading Expert Speaker Biographies**



Jeffrey Vacirca, M.D., F.A.C.P.

Jeffrey Vacirca, M.D., F.A.C.P. is a board-certified hematologist and oncologist, serving as Chief Executive Officer and Chairman of the board at New York Cancer & Blood Specialists. Dr. Vacirca serves on the executive board of Community Oncology Alliance (COA) and is the medical director for the International Oncology Network (ION), Oncology Network Development at Mt. Sinai Health Network, and for Long Island Aids Care (LIAC). Dr. Vacirca serves on the board of directors of Spectrum Pharmaceuticals, OneOncology, BeyondSpring, and the American Red Cross of Greater New York.

Dr. Vacirca is the founder and chairman of the New York Cancer Foundation, which provides financial assistance to patients undergoing cancer treatment. He is also co-founder and former vice-chairman of Odonate Therapeutics, and director and chair of the Compensation Committee of Spectrum Pharmaceuticals. Dr. Vacirca is the co-founder and president of the National Translational Research group.

Dr. Vacirca has received numerous awards and accolades for his efforts in providing outstanding patient care including Humanitarian of the Year by the American Red Cross, the Theodore Roosevelt Award for outstanding dedication to patient care, and being named in Newsday's Top Doctors. Additionally, he was honored for his role in enabling LIAC staff to bring state of the art HIV testing to New York.



Douglas W. Blayney, M.D.

BeyondSpring

**Douglas W. Blayney, M.D.** is a Professor of Medicine (Oncology) at Stanford, former Medical Director of Stanford Cancer Center, and specializes in the treatment of breast cancer. He has a special interest in the quality and value of cancer care. Dr. Blayney is a past president of the American Society of Clinical Oncology (ASCO), a founder of the ASCO Quality Symposium, a co-author of the ASCO value framework descriptions, and instigated the ASCO clinical "big data" effort, which is now CancerLinQ. He received the inaugural Ellen Stovall Award for Leadership in Patient Centered Care from the National Coalition for Cancer Survivorship in 2016. He was previously a Professor of Internal Medicine and Medical Director of the Comprehensive Cancer Center at the University of Michigan, and prior to that practiced and led Wilshire Oncology Medical Group, Inc. a physician owned multidisciplinary oncology practice in southern California. He has expertise on clinical trial development, use of oncology drugs in clinical practice, reimbursement and marketing strategies and information technology use.

Dr. Blayney's research interests include breast cancer, febrile neutropenia mitigation, and the use big data to improve cancer care quality and value. He has over 90 scientific publications. Dr. Blayney has served on the Food and Drug Administration's Oncologic Drugs Advisory Committee and is Founding Editor-in-Chief and Editor-in-Chief Emeritus of ASCO's Journal of Oncology Practice. He has a degree in electrical engineering from Stanford, is a graduate of the University of California, San Diego School of Medicine, and received post graduate training at UCSD and at the National Cancer Institute in Bethesda, Maryland.





Jeffrey Vacirca, M.D., F.A.C.P.

# **Chemotherapy Induced Neutropenia**



### **CIN Overview**

- Chemotherapy-induced-Neutropenia (CIN) is a common side effect of myelosuppressive chemotherapeutic treatment in many cancer patients.
- Chemotherapy kills fast dividing cells, which includes cancer cells, and white blood cells in bone marrow.
- Patients with severe (grade 4) neutropenia have an abnormally low blood neutrophil level (one type of white blood cell) and are more susceptible to severe infection, that often require chemotherapy regimen adjustment, compromising the effectiveness of chemotherapy and eventual survival of the patients (Lalami 2017).
- Moreover, infection resulting from neutropenia manifested as febrile neutropenia (FN) can lead to hospitalization, morbidity, and mortality in as many as 10% of patients (Link 2001; Kuderer 2006; Burris 2010).
- No matter what chemotherapy is used, the ANC (absolute neutrophil count) Nadir occur at day 7-10 after chemotherapy use in cycle 1 (Cheng 2014).
- Therefore, CIN is a problem with bone marrow, not related to specific cancer or chemotherapy (Cheng 2014; Burris 2010), and it is a serious life-threatening condition.

# CIN is a Large and Growing Market PD-1 + chemo approved, so chemo will not go away

### Plinabulin + G-CSF in each cycle of chemo in non-myeloid cancers prevented or reduced the severity of neutropenia



### U.S. Sales -- \$4.5 Billion<sup>2</sup>

As a combination therapy Plinabulin's base of business is G-CSF units

G-CSF cycles/year:

- U.S.: 1.3 million<sup>2</sup>
- Global: 4 million<sup>3</sup>

Unit growth (U.S.):<sup>2</sup>

- MAT Aug '19: 6.8%
- MAT Aug '20: 1.1%\*

# 50%+ growth expected in use of first-line chemotherapy by 2040 worldwide<sup>4</sup>



Note: <sup>1</sup> Centers for Disease Control and Prevention. Information for Health Care Providers. Available at: <u>www.cdc.gov/cancer/preventinfections/providers.htm.</u> Accessed February 21, 2020; <sup>2</sup> NSP IQVIA July '20; <sup>3</sup>G-CSF market size based on IQVIA data (MIDAS for ex-U.S. and DDM MD for U.S.; Q3 '16 to Q2 '18. Standardized G-CSF units. 4. Wilson B, Jacob S, Yap ML, et al. Estimates of global chemotherapy demands and corresponding physician workforce requirements for 2018 and 2040: a population-based study. Lancet Oncology 2019; 20(6): 769-780. \* Growth despite a 20% decline in chemotherapy cycles nationwide from March – June '20 due to the pandemic.

## **CIN: The #1 Reason for Chemotherapy Disruptions**



DISRUPTIONS TO CHEMOTHERAPY CAN HAVE DEVASTATING EFFECTS ON OUTCOMES

MONOTHERAPY G-CSF CAN'T ADDRESS THE UNMET NEED

ONCOLOGISTS: CIN AS A PRIORITY AMONG CHEMOTHERAPY-RELATED TREATMENT DECISIONS<sup>1</sup> MONOTHERAPY GRANULOCYTE-COLONY STIMULATING FACTOR (G-CSF) DOESN'T ALLOW FOR CHEMOTHERAPY OPTIMIZATION<sup>2,3</sup> SLIGHT CHANGES IN DOSING OR DELIVERY CAN HAVE A DEVASTATING IMPACT ON SURVIVAL<sup>4</sup>

15%

**REDUCTION IN RELATIVE DOSE** 

**INTENSITY** 





**CIN** remains the #1 reason for FN, ER visits, hospitalization, sepsis, mortality and chemotherapy disruption<sup>2</sup>



BONE PAIN remains significant clinical issue<sup>3</sup>



REDUCTION IN OVERALL SURVIVAL

QA08: In a patient's overall treatment plan, how much of a priority is treating CIN relative to other complications of chemotherapy (e.g. liver/renal toxicity, nausea/vomiting, anemia, etc.)?; n=110



Source: <sup>1</sup> Proprietary market research (Sept 2020), BYSI Summer/Fall 2019. <sup>2</sup> LaLami. <sup>3</sup> Moore. <sup>4</sup> Bonadonna G, Valagussa P, Moliterni A et al. Adjuvant cyclophosphamide, methotrexate, and fluorouracil in nodepositive breast cancer. N Engl J Med 1995;332:901-906

# **New CIN Guidelines Double the Addressable US Market**

### • CIN guidelines modified in early 2020:

- COVID-19 recognized as a universal risk factor
- Prophylaxis now recommended for both high and intermediate risk patients
- The addressable population increased by 100%:
  - 2019: 30% of intermediate risk patients received prophylaxis for CIN<sup>1</sup>
  - 2020: 60% dramatic jump in approach to preventing CIN<sup>2</sup>

### **CIN Prophylaxis Market Dynamics Post-Guideline Update**





## **Monotherapy G-CSF Fails to Prevent Chemo Regimen Changes**



### PERCENT OF PATIENTS WITH SIGNIFICANT REGIMEN CHANGES

Chemo regimen changes occur in an unacceptably high percentage of patients resulting in:

- Reduction in dose
- Delays in administration
- Overall reduction in RDI



<sup>1</sup>Published, 2015. Per EMR review of 16,233 patients with 6 different tumor types 2007-2011. JNCCN—Journal of the National Comprehensive Cancer Network Volume 13 Number 11 November 2015, <sup>2</sup>Denduluri et al. Abbreviations: 5-FU, 5-fluorouracil; ABVD, doxorubicin, bleomycin, vinblastine, dacarbazine; AC, doxorubicin, cyclophosphamide; CRC, colorectal cancer; FOLFOX4/mFOLFOX6, folinic acid, 5-fluorouracil, oxaliplatin; NHL, non-Hodgkin lymphoma; NSCLC, non–small cell lung cancer; R-CHOP/CHOP, cyclophosphamide, doxorubicin, vincristine, prednisone ± rituximab; RCVP/CVP, cyclophosphamide, vincristine, prednisone ± rituximab; RDI, relative dose intensity; TAC, docetaxel, doxorubicin, cyclophosphamide; TC, docetaxel, cyclophosphamide; TCH, docetaxel, carboplatin, trastuzumab.



BevondSpring

# "The Neutropenia Vulnerability Gap" – the First 10 days

### FEBRILE NEUTROPENIA RISK: FIRST 10 DAYS OF CHEMOTHERAPY

### MONTHERAPY G-CSF CAN LEAVE PATIENTS UNPROTECTED ATTHE MOST CRUCIAL TIME DURING CHEMOTHERAPY



FIRST 10 DAYS AFTER CHEMOTHERAPY PRESENT THE GREATEST ACCELERATION IN RISK OF HOSPITALIZATION



Risk and timing of hospitalization for febrile neutropenia in patients receiving CHOP, CHOP-R, or CNOP chemotherapy. Risk composite: Age >= 65; Albumin level <=3.5 g/dl; ANC < 1.5x10^9 cells/L; planned ARDI >=80%; hepatic comorbidity; no early use of G-CSF

Cancer, Volume: 98, Issue: 11, Pages: 2402-2409, First published: 17 November 2003, DOI: (10.1002/cncr.11827)

# Grade 4 neutropenia leads to development of fever and infection; and to chemo dose reduction and less survival

Grade 4 neutropenia was associated with fever (p = 0.04), documented infection (p < 0.0001), and bacteremia (p = 0.002)<sup>1</sup>



# Grade 4 neutropenia leads to dose reduction to <85% of optimum dose $\rightarrow$ lower OS<sup>2</sup>



BeyondSpring

Note: <sup>1</sup>Buckley SA et al., "Prediction of adverse events during intensive induction chemotherapy for acute myeloid leukemia or high-grade myelodysplastic syndromes." American J. Hematology 2014; 89(4): 423-28. 2. Denduluri N et al., Clinical Breast Cancer 18(5): 380-386 (2018); Lalami et al. Critical Reviews in Oncology / Hematology 120: 163-179 (2017).

### The Unmet Clinical Need: Monotherapy G-CSF Is Not Enough

DESPITE A BROAD USE OF MONOTHERAPY G-CSFS, THE "4DS" ARE A VEXING CLINICAL CHALLENGE FOR PREVENTING NEUTROPENIA



...CIN and/or febrile neutropenia may have long-term effects with clinical impact on the overall chemotherapy treatment plan, resulting in dose reductions and/or treatment delays, chemotherapy discontinuation, or a switch to less toxic alternatives, and potentially less effective regimens, leading finally to decreased response and survival rates<sup>1</sup>.





Douglas W. Blayney, M.D.

Plinabulin: New GEF-H1 Activation Small Molecule , Non-G-CSF, with Neutropenia Protection and Anti-Cancer Activity



**Under Clinical Development** 

# Plinabulin: "Pipeline in a Drug" for Multiple Cancer Indications





# **Mechanism of Action**

First-in-Class Stem Cell Modulator via GEF-H1 Activation

# Plinabulin: First-in-Class Agent, Stimulating Innate and Adaptive Immune System (Proven Target: Immune Defense Protein GEF-H1)



Plinabulin's immune mechanism designed to enable its effects in multiple cancer indications:

- Chemotherapy Induced Neutropenia (CIN): Designed to protect progenitor cells from chemo assault in bone marrow with week 1 benefit, which compliments G-CSF week 2 benefit for improved benefit potential
- NSCLC: Chemo (e.g. docetaxel) introduces real time tumor antigen, Plinabulin is designed to mature DC, leading to T cell activation, and durable anti-cancer benefit
- Multiple Cancer Indications: Triple combo combines "tumor antigen generation" from chemo/radiation, plinabulin "adding T cell gas", and PD-1/PD-L1 "release the brake" for potential maximum durable anticancer benefit

### For animated MOA Click Here



Note: 1 La Sala et al., 2019 Chem. 2 Kashyap et al., 2019 Cell Reports. 3 Zhang et al., 2005 Mol Cell Biol. 4 Singh et al., 2011 Blood. 5 Suwa et al., 2000 Am J Physiol Heart Circ Physiol; Ghosh et al., 2018 ACR Annual Conference; Blayney et al., Society of Leukocyte Biology. 6 Asensi et al., 2004 Infection and Immunity.

## **Plinabulin Registration Studies**





# Breakthrough Therapy Designation (US & China FDA) - NDA submission Q1 2021

Plinabulin + G-CSF in Chemotherapy-Induced Neutropenia (CIN)

## **New CIN Guidelines Double the Number of Potential Patients**

### • CIN guidelines modified in early 2020:

- COVID-19 recognized as a universal risk factor
- Prophylaxis now recommended for both high and intermediate risk patients
- The addressable population increased by 100%:
  - 2019: 30% of intermediate risk patients received prophylaxis for CIN<sup>1</sup>
  - 2020: 60% dramatic jump in approach to preventing CIN<sup>2</sup>

💱 🍕 BeyondSpring

### CIN Prophylaxis Market dynamics post-guideline update







### **CIN: Severe Unmet Medical Need, Despite Use of G-CSF**

# Current Standard of Care for CIN Still Presents Severe Unmet Medical Need Even with the Use of G-CSF (e.g. TAC, breast cancer)

	Pegfilgrastim used after TAC for breast cancer			
	Efficacy	Pegfilgrastim 6 mg <sup>1</sup> n=29	Pegfilgrastim 6 mg <sup>2</sup> n=61	
Efficacy issue	Neutropenia (grade 3/4)	96.6%	100%	
Lineacy issue	Neutropenia (grade 4)	93.1%	83.3%	
	DSN	$1.4 \pm 0.7$	$1.8 \pm 1.2$	
	Mean ANC nadir (10 <sup>9</sup> /L)	0.255 ± 0.287	0.266	

- Guidelines for grade 3/4 neutropenia are to reduce or delay chemotherapy dosing by 5-7 days<sup>5</sup>
- In cancer patients with <85% relative dose intensity (RDI), patient survival is 50% of those with >=85% RDI<sup>5</sup>
- TAC is a very effective chemo treatment with ORR at 83%<sup>6</sup>, but because of its high severe neutropenia rate, TAC needs to be changed to less effective TC (with ORR at 42%)<sup>7</sup> and TA (with ORR at 51%)<sup>8</sup>

	Pegfilgrastim used after chemotherap	у	
Safaty issue	Safety	Pegfilgrastim 6 mg <sup>3</sup> n=100	Pegfilgrastim 6 mg <sup>4</sup>
Salety Issue	Bone pain (score of 1-10)	59%	71%
	Severe bone pain (score of 6-10)	24%	27%



Note: 1 Masuda N et al., Support Care Cancer 23: 2891-2898 (2015). 2 Lee J et al., Annals of Surgical Treatment and Research 94(5): 223-238 (2018). 3 Kirshner et al., Comm Onc 4:455-459 (2007). 4 Xu et al., Support Care Cancer 24:723-730 (2016). 5 Lalami et al., Critical Reviews in Oncology / Hematology 120 163-179 (2017). ). 6 O'Regan et al., Clinical Breast Cancer 6(2): 163-168 (2005). 7 Vasey et al., British J Cancer 87: 1072-78 (2002). 8 Alba et al. JCO 22(13): 2587-93 (2002).

## Grade 4 Neutropenia Leads to Development of Fever and Infection; and to Chemo Dose Reduction and Less Survival

Grade 4 neutropenia was associated with fever (p = 0.04), documented infection (p < 0.0001), and bacteremia (p = 0.002)<sup>1</sup>









Note: 1Buckley SA et al., "Prediction of adverse events during intensive induction chemotherapy for acute myeloid leukemia or high-grade myelodysplastic syndromes." American J. Hematology 2014; 89(4): 423-28. 2. Denduluri N et al., Clinical Breast Cancer 18(5): 380-386 (2018); Lalami et al. Critical Reviews in Oncology / Hematology 120: 163-179 (2017).



# **Plinabulin CIN Program**

# **Plinabulin's Chemotherapy-Induced Neutropenia Program**

1	<b>Study 101</b> Phase2	NSCLC	Plinabulin vs Placebo	Plinabulin reduced the incidence of grade 4 neutropenia from 33.8% in the docetaxel arm to less than 5% in the Plinabulin + docetaxel arms (p < 0.0003) on Day 8 of the first cycle of chemotherapy
2	<b>Study 105</b> Phase 2 Protective 1	<b>CIN</b> Advanced or Metastatic NSCLC	Plinabulin vs pegfilgrastim	Both Plinabulin and pegfilgrastim had a 14% incidence of grade 4 neutropenia, but Plinabulin demonstrated a superior safety profile, with less bone pain, thrombocytopenia and immune suppression
3	<b>Study 105</b> Phase3 Protective 1	<b>CIN</b> Breast, Prostate, Lung	Plinabulin vs pegfilgrastim	Plinabulin achieved non-inferior duration of severe neutropenia (DSN) and more rapid onset of action compared with pegfilgrastim Data submitted to ASCO May 2021 annual meeting for presentation
4	<b>Study 106</b> Phase 2 Protective 2	<b>CIN</b> Breast	Plinabulin + pegfilgrastim vs pegfilgrastim and Plinabulin	Plinabulin combined with pegfilgrastim demonstrated chemotherapy induced neutropenia efficacy superiority by increasing the rate of prevention of grade 4 neutropenia by 53% increase, and safety superiority with less bone pain
5	<b>Study 106</b> Phase 3 Protective 2	<b>CIN</b> Metastatic Breast	Plinabulin + pegfilgrastim vs pegfilgrastim	Recently completed registration trial and has met primary and secondary endpoints Data submitted to ASCO May 2021 annual meeting for presentation

4 chemotherapy induced neutropenia clinical trials (on 400+ patients) already proved Plinabulin's potential to statistically reduce grade 4 neutropenia





# Phase 2: Study 101 NSCLC

## Phase 2 Study 101: Plinabulin has Anticancer Activity in NSCLC



- Plinabulin MoA- targeted patients: Measurable lung lesion with RECIST 1.1 (CT scan > 1 cm in lung), which is around 70% of NSCLC
- Improved QoL and favorable Safety profile

### Study 101 Phase 2: Plinabulin has Superior Grade 4 Chemotherapy Induced Neutropenia Prevention vs 'Placebo'

Incidence of neutropenia in patients treated with Docetaxel vs. Docetaxel + Plinabulin-20 mg/m2







### **Protective-1 Phase 2 (Study 105)**

# **PROTECTIVE-1** Phase 2 (Study 105): Plinabulin vs. Pegfilgrastim

### **Protective-1 Phase 2 Design**



Open label, global trial (CRO & central lab: Covance)

# Protective-1 Phase 2 (Study 105) : Single Agent Plinabulin prevents Grade 3/4 Neutropenia

### Log Transform Absolute Neutrophil Count Measured During Cycle 1



# Protective-1 Phase 2 (Study 105): Plinabulin 20 mg/m<sup>2</sup> and Pegfilgrastim have Equal Efficacy

### The Maximum Neutrophil Toxicity Grade in Cycle 1 for Patients in each Treatment Arm



# Protective-1 Phase 2 (Study 105): Plinabulin Demonstrated Improved QoL vs Pegfilgrastim

**Global Health Status (Quality of Life)** 



## Protective-1 Phase 2 (Study 105): Plinabulin does not cause Bone Pain

### Pain at its Worst in the Last 24 Hour





# Protective-1 Phase 2 (Study 105): Plinabulin has less Thrombocytopenia vs Pegfilgrastim

### Mean Percent Change in Platelets from Baseline in Cycle 1



	Pegfilgrastim	Plinabulin
Dosing	Day 2	Day 1, 30 minutes after chemo
Chemotherapy induced neutropenia benefit	Similar	Non-inferior
% Bone pain	Yes	No from day 3
Thrombocytopenia	Yes	No
Immune suppression	Yes	No
Anti-cancer activity	Νο	Yes





# **Protective-1 Phase 3 (Study 105)**

# **PROTECTIVE-1** Phase 3 (Study 105): Plinabulin vs. Pegfilgrastim - Met non-inferiority DSN endpoint at phase 3 interim

### **Protective-1 Phase 3 Design ( 4 cycles)**



Double blind, global trial (CRO & central lab: Covance)

**BeyondSpring** 

- Assess DSN in treatment cycle 1
- Assess mean bone pain score from pre-dose Day 1 through Day 8 in
- Proportion of patients with neutrophil-to-lymphocyte ratio (NLR) >5 after Day 7 through Day
- Proportion of patients with Bands
- Incidence of infections in Cycles 1
- Proportion of patients with Grade 4 neutropenia in Cycles 1, Day 1 to



# **Protective 2: Phase II (Study 106)**

# **PROTECTIVE-2** Phase 2 (Study 106) : Plinabulin vs. Pegfilgrastim



# Protective 2 Phase 2 (Study 106) : Rationale for combining Plinabulin (week 1 protection) with Pegfilgrastim (week 2 protection)

### Median ANC in cycle 1 after TAC for breast cancer



Plinabulin chemotherapy induced neutropenia MOA: rapid onset of action in week 1, complimentary to G-CSF



# PROTECTIVE 2, Phase2 (Study 106) : Plinabulin + G-CSF Offers Significant Improvements over SOC in CIN

Percentage of Patients with Grade 4 Neutropenia in Cycle 1





# PROTECTIVE 2, Phase2 (Study 106) : Plinabulin + G-CSF Offers Significant Improvements over SOC in CIN

Percentage of Patients with Grade 3 or Grade 4 Neutropenia in Cycle 1



### Mean of ANC Nadir during Cycle 1



# Protective 2 Phase 2 (Study 106): Plinabulin / Pegfilgrastim Combo Demonstrates a Clear Superiority Profile Against Neulasta, Standard of Care

Plinabulin / Pegfilgrastim Combo demonstrates a clear superiority profile after TAC for breast cancer				
	Pegfilgrastim	Plinabulin /Pegfilgrastim Combo		
DSN (grade 3/4)	Over 1 day	Less than 1 day		
% neutropenia (grade 3/4)	High (> 80%)	Low (50%) p<0.05		
Median ANC nadir (10 <sup>9</sup> cells/L)	0.47 (> 50% with grade 4 neutropenia)	1.00 (> 50% avoid grade 3/4 neutropenia)		
% bone pain	Almost all	Limited		
Immune suppression	Yes	Limited		
Anti-cancer	No	Yes		





### **Protective 2: Phase III (Study 106)**

Plinabulin Trials Designed to Maximize Broad Potential: Plinabulin + G-CSF for all Chemo in Non-Myeloid Cancers

### Protective-2 Phase 3 Design (4 cycles of chemo treatment)



Double blinded, active controlled, global trial (CRO & central lab: Covance)



<sup>1</sup>TAC=Docetaxel, doxorubicin and cyclophosphamide. <sup>2</sup>Duration of Severe (Grade 4) Neutropenia <sup>3</sup>Absolute Neutrophil Count <sup>4</sup>Relative Dose Intensity <sup>5</sup>Fixed dose, equivalent to 20 mg/m<sup>2</sup>

## Superior CIN Prevention G-CSF vs G-CSF + Plinabulin Combo after TAC for Breast Cancer in Cycle 1

### **Prevention of Grade 4 Neutropenia**



### Prevention of Grade 3 and 4 Neutropenia

20.70%

mg) (n=111)



Percentage

# PROTECTIVE-2 Phase 3 data: positive topline results with statistical significance favoring the combination

Key Efficacy Endpoints	Results (combo n=111, pegfilgrastim n=110)		
Primary endpoint:			
Proportion of patients with prevention of grade 4 neutropenia in Cycle 1	<ul> <li>31.5% vs. 13.6%, p=0.0015</li> <li>&gt;100% better prevention rate in combination of plinabulin + G-CSF</li> </ul>	Better safety profile in the combination vs. SoC	
Key secondary endpoints (based on ANC):		<ul> <li>&gt;20% less grade 4 AEs in the combination (58 6%)</li> </ul>	
Mean DSN in Cycle 1, Day 1-8	<ul> <li>p = 0.0065</li> <li>Plinabulin's MoA of early onset in Week 1</li> </ul>	compared to pegfilgrastim alone <b>(80.0%)</b>	
Mean DSN in Cycle 1 (severe neutropenia: ANC < 0.5 x 10 <sup>9</sup> cells/L)	<ul> <li>p = 0.0324</li> <li>Combination is better in CIN benefit vs. G-CSF in cycle 1</li> </ul>		
Mean ANC Nadir (x 10 <sup>9</sup> cells/L)	<ul> <li>0.538 vs. 0.308, p = 0.0002</li> <li>The combination helps to lift patients away from grade 4 danger zone</li> </ul>	<b>Profound Neutropenia</b> leads to 80% death in first week of infection <sup>1</sup> , 48% FN and 50% Infection <sup>2</sup> .	
Mean Duration of Profound Neutropenia in cycle 1 (Profound Neutropenia: ANC < 0.1 x 10 <sup>9</sup> cells/L)	<ul> <li>p = 0.0004</li> <li>Combo better than G-CSF alone in CIN benefit</li> </ul>		

BeyondSpring

# Protective-2 (Phase 3): Superior prevention of Profound Neutropenia with Combination vs G-CSF alone





The combination reduces the incidence of Profound Neutropenia by >50% Compared to G-CSF Alone, which correlates to >40% FN risk reduction in the combo vs. G-CSF.

### **In Summary**

- Plinabulin is a novel, **non-GSF**, small-molecule agent for the **prevention of CIN** through GEF-H1 activation
  - Plinabulin + G-CSF is superior to G-CSF alone
  - Plinabulin as a **single agent** is **non-inferior** to pegfilgrastim
- The **unmet need** with pegfilgrastim is **in week 1** of the cycle:
  - $\circ$  Plinabulin protects in week 1
  - Pegfilgrastim protects in week 2
  - $\,\circ\,$  This is the rational of the combination
- Plinabulin has a proven anti-cancer effect







www.beyondspringpharma.com