

Member FINRA/SIPC

Toll-Free: 561-391-5555 ♦ www.DawsonJames.com ♦ 1 North Federal Highway - Suite 500 ♦ Boca Raton, FL 33432

BeyondSpring (NASDAQ:BYSI)

August 16, 2019

## BUY: A New Approach to Cancer Chemo Care

*BeyondSpring's Plinabulin is well positioned to change the treatment paradigm for cancer. Plinabulin is advancing towards approval for NSCLC treatment and chemotherapy-induced neutropenia (CIN) prevention in both the U.S. and China.*

**Jason H. Kolbert**

Head of Healthcare Research

646-465-6891

[jkolbert@dawsonjames.com](mailto:jkolbert@dawsonjames.com)

### Investment Highlights

**The Market Opportunity (China initially, the U.S.) for NSCLC is Large.** It's projected that with over \$122B in pharmaceutical sales, China is one of the largest markets in the world. Some forecasts project revenues to reach over \$167B by 2020 with an annual growth rate approaching 10%. There are over two million cases of lung cancer every year worldwide, with the mortality rate from the disease in China expected to increase by 40% over the next 10 years. BeyondSpring and Plinabulin have great potential to address what many see as an unmet medical need.

**Prophylactic Advantage in Fighting Neutropenia.** Presently, the market for chemotherapy-induced neutropenia (CIN) is dominated by Neulasta and Neupogen. These biologics are primarily only offered to high-risk patients and must be administered over 24 hours post chemotherapy. Plinabulin is mechanistically different than Neulasta/Neupogen. It promotes anti-oncologic effects and can be offered as soon as 30 minutes after chemo, establishing Plinabulin as a viable prophylactic treatment for CIN.

**Platform Drug.** Plinabulin is in multiple clinical trials to evaluate its utility in multiple indications. The drug offers breakthrough treatment for CIN prevention, shows signs for anti-cancer efficacy, and immune-related side effect reduction with a favorable adverse events profile. Two Phase 2/3 trials are evaluating the efficacy of Plinabulin and Plinabulin combined with G-CSF (granulocyte colony-stimulating factor) in the prevention of chemotherapy-induced neutropenia. A Phase 3 trial studying Plinabulin in combination with docetaxel for treatment of NSCLC is nearing a final readout. These clinical trials for the two most advanced indications are expecting NDA filings in China during 2H19 for NSCLC and CIN, and in the U.S. during 2020.

**Valuation.** Our therapeutic models for Plinabulin go out to the year 2030. For modeling purposes, we use a 30% risk rate (r) in our Free Cash Flow to the Firm (FCFF), discounted EPS and Some-Of-The-Parts (SOP) models. Our price target is derived from these three models, equally weighting and averaged to the nearest whole number. The result is a one year price target of \$39.00 per share.

**Risk to our thesis, include the following:** (1) clinical trial; (2) commercial; (3) employee; (4) financial; (5) intellectual property; (6) partnership; and (7) regulatory. We review these and other risks in the risk section of this report.

 Current Price \$16.00  
 Price Target \$39.00

Estimates	F2019E	F2020E	F2020E
Expenses (\$000s)	\$ 45,000	\$ 57,736	\$ 68,001
1Q March	\$ 7,969	\$ 13,279	\$ 15,640
2Q June	\$ 10,800	\$ 13,857	\$ 16,320
3Q September	\$ 11,700	\$ 15,011	\$ 17,680
4Q December	\$ 14,531	\$ 15,589	\$ 18,360
Estimates	F2019E	F2020E	F2020E
EPS (diluted)	\$ (1.79)	\$ 1.73	\$ 7.22
1Q March	\$ (0.32)	\$ 0.45	\$ 1.66
2Q June	\$ (0.45)	\$ 0.40	\$ 1.73
3Q September	\$ (0.47)	\$ 0.43	\$ 1.88
4Q December	\$ (0.56)	\$ 0.45	\$ 1.95

EBITDA/Share	(\$1.83)	\$1.76	\$7.61
EV/EBITDA (x)	216	-225	-52

Stock Data		
52-Week Range	\$13.06	\$26.98
Shares Outstanding (mil.)	26.0	
Market Capitalization (mil.)	\$415	
Enterprise Value (mil.)	\$396	
Debt to Capital	0%	
Book Value/Share	\$1.20	
Price/Book		
Average Three Months Trading Volume (K)	27	
Insider Ownership	69.3%	
Institutional Ownership	8.8%	
Short interest (mil.)	1.9%	
Dividend / Yield	\$0.00/0.0%	



Initiation - August 16, 2019 - Buy - Price Target \$39

**Exhibit 1. Upcoming Catalysts for BeyondSpring Pharmaceuticals**

Product	Geography	Indication	Event	Timeline	Impact
Plinabulin	China	CIN Study 105	Phase 3 final readout and China NDA filing	2H19	+++
Plinabulin	US	CIN Study 105	Phase 3 final readout and U.S. NDA filing	2020	+++
Plinabulin+G-CSF	China	CIN Study 106	Phase 2 final readout	2H19	++
Plinabulin+G-CSF	US	CIN Study 106	Phase 2 final readout	2020	++
Plinabulin+docetaxel	China	NSCLC (2nd/3rd line) Study 103	Phase 3 final readout and China NDA filing	2H19	+++
Plinabulin+docetaxel	US	NSCLC (2nd/3rd line) Study 103	Phase 3 final readout and China NDA filing	2020	++

Stock Significance Scale: + of moderate importance; ++ higher level; +++ very important

Source: Company reports and Dawson James forecasts

**Exhibit 2. BeyondSpring Pipeline**

	Program	Indication	Trial name	Preclinical	Phase 1	Phase 2	Phase 3	Commercial rights	China NDA filing	U.S. NDA filing
Late stage	Plinabulin + docetaxel	NSCLC (2 <sup>nd</sup> /3 <sup>rd</sup> line)	Study 103	Phase 3 first interim data analysis completed				Global <sup>1</sup>	Q4 2019/ Q1 2020	2020
	Plinabulin	CIN	Study 105	Phase 3 primary end point met at interim analysis				Global <sup>1</sup>	Q4 2019/ Q1 2020	2020
	Plinabulin + pegfilgrastim		Study 106	Phase 2 efficacy / safety end points met						
Investigator-initiated IO	Plinabulin + nivolumab	NSCLC (2 <sup>nd</sup> /3 <sup>rd</sup> line)	Fred Hutch/Univ. Washington/UCSD					Global <sup>1</sup>		
	Plinabulin + nivolumab + ipilimumab	SCLC	Rutgers University					Global <sup>1</sup>		
	Plinabulin + pembrolizumab + chemo	NSCLC (1 <sup>st</sup> line)	Johns Hopkins					Global <sup>1</sup>		
Other oncology pipeline	Ubiquitination platform	Target KRAS	Univ. Washington /NYU					Global		
	BPI-002	Oral CTLA-4 inhibitor						Global		
	BPI-003	IKK inhibitor						Global		
	BPI-004	Neo-antigen generator						Global		

Note: <sup>1</sup> We own global rights to Plinabulin in all countries except China. In China, we currently own a 60% interest in our Chinese subsidiary, Wanchun Bulin, which owns a 100% interest in Plinabulin. Wanchun Bulin has entered into definitive agreements for the sale of equity interests to certain investors, which are expected to close in the near term. Upon closing, it is expected that we would hold 57.14% of Wanchun Bulin.

Source: BeyondSpring

A special thanks to Jesse Clark - University of Florida , Ryan Swiezbin- Quinnipiac University, Chase Shea - Georgetown University, Alex Levy - University of Wisconsin-Madison , Tucker Kolbert - University of Wisconsin -Madison, Clayton Berger – Skidmore College, for their research contributions to this report.

## Company Overview

BeyondSpring is a global biopharmaceutical company developing immuno-oncology cancer treatments. Late stage clinical trials are in progress for the company's flagship molecule, Plinabulin. It is being tested as an anti-cancer agent to treat non-small cell lung cancer (NSCLC), as well as a preventative treatment for high and intermediate risk chemotherapy-induced neutropenia (CIN). The therapeutic efficacy is also being studied for potential benefits when combined with other immuno-oncology agents. BeyondSpring owns global rights to Plinabulin in all countries, except for China, where it owns a position in a subsidiary company that holds the rights. In addition to Plinabulin, three small molecule immune agents are in early stages of development and BeyondSpring is researching a drug development platform utilizing ubiquitin-mediated protein degradation. The strategy of dual development in the U.S. and China makes BeyondSpring somewhat unique in the pharma world. The ability to conduct operations in both countries allows for expedited clinical trial enrollment, reduced synergistic costs, acceleration of the approval process, and access to the Chinese and U.S. oncology markets.

Studies of Plinabulin's mechanism of action indicate that it activates a guanine nucleotide exchange (multiple factors), which in turn initiates a signaling pathway triggering T-cell production and reducing and or even preventing neutropenia. A Phase 2/3 trial is underway for the combination of Plinabulin and Neulasta in the treatment of CIN. A second global Phase 2/3 trial studies the efficacy of Plinabulin versus Neulasta following treatment with docetaxel. Plinabulin has shown a favorable profile versus G-CSF with less bone pain, prevention of immune suppression, and prevention of CIN. A third Phase 3 trial is evaluating a combined Plinabulin with docetaxel in the treatment of NSCLC. Growth factor agents (neutrophils), predominantly to treat CIN, had greater than \$10B in sales, last year. As a new agent with a favorable adverse effects profile which allows prophylactic application, we see ample opportunity for Plinabulin to become a new standard of care for CIN treatment, especially in China.

## Senior Management

**Lan Huang, Ph.D., Co-founder, Chairman, CEO.** Dr. Huang has more than a decade of entrepreneurial experience in the Chinese and U.S. biotechnology industry. She has invented and holds patents for several biotech products for oncology and dermatology indications. Prior to founding BeyondSpring, Dr. Huang co-founded Wuxi MTLH Biotechnology Co. Ltd., whose self-designed cancer peptide drug's China rights were acquired in 2010 by Shanghai Pharmaceutical Group, one of the top three pharmaceutical companies in China. She also co-founded Paramax International, a clinical CRO company in China, which was sold to RPS (a global CRO), then to Warburg Pincus in 2011. In addition, Dr. Huang worked with Forward Ventures, where she led partnering initiatives between Forward's portfolio companies and Chinese pharmaceutical companies. She received her Ph.D. in Chemistry in four-and-a-half years from the University of California at Berkeley, where she won the graduating Ph.D. woman award from Soroptimist International. Her translational research in cancer signaling pathways involving Ras was published in two Nature papers. Dr. Huang received her B.A., Magna Cum Laude and Phi Beta Kappa, from Lawrence University, where she served as a trustee. She also studied at Fudan University in Shanghai, China

**Ramon Mohanlal, M.D., Ph.D., CMO.** Dr. Mohanlal has more than 20 years of global experience in strategic drug development at big pharma, and biotech start-ups, including GlaxoWellcome (GSK), Pharmacia (Pfizer), Vertex, Interleukin Genetics, Syntium, Novartis, and AstraZeneca. His expertise includes drug development in all Phases (preclinical and 1, 2, 3, 4 clinical, post-marketing), regulatory filings and maintaining drugs on the market. Dr. Mohanlal played a crucial role in bringing five drugs to market and was deeply involved in the development of 15 marketed drugs, including Wellferon, Atovaquone, Lamuvidine, Zomig, Advexin, Abilify IM Depot, Zometa, Femara, Aredia, Proleukin, Cardioxane and Exjade. Most recently, Dr. Mohanlal was the Clinical Head of Established Oncology Products for Novartis, where he managed all clinical and regulatory maintenance work for the division, which represented total annual revenue of approximately \$2 billion. Dr. Mohanlal earned his M.D. and Ph.D. in Experimental CV Pharmacology, both from the University of Leiden, The Netherlands, as well as his M.B.A. from the American Intercontinental University in Illinois, with post-graduate business training at the MIT Sloan School of Management, Cambridge, Massachusetts.

**Edward Dongheng Liu, CFO.** Edward Dongheng Liu joins BeyondSpring with more than a decade of investment banking and investment experience in the Asia-Pacific region. Prior to joining BeyondSpring, Mr. Liu was a Partner and Executive Director at Epiphron Capital, a cross-border, healthcare-focused investment fund that was an early investor in BeyondSpring. Prior to that, he held various leadership positions in the investment banking industry based in Hong Kong focusing on clients in the Asia-Pacific region. He was a Senior Vice President and Vice President at Investment Banking and Capital Markets at Jefferies. Prior to Jefferies, he held various roles of increasing responsibilities at Investment Banking Division at J.P. Morgan. As an investment banker, Mr. Liu has led financing and M&A transactions for clients across sectors with a total transaction value exceeding US\$30 billion. Mr. Liu received his bachelor's degree in economics and mathematics from Yale University. He also completed biomedical engineering coursework at Tsinghua University.

**Richard Daly, COO.** Mr. Daly joins the Company with more than 25 years of experience heading business and commercial operations for leading pharmaceutical and biotech companies, including as Executive Vice President at Takeda Pharmaceuticals U.S. and as President of AstraZeneca's U.S. Diabetes subsidiary. Most recently, Mr. Daly served as CEO, President and Chairman of Neuralstem, Inc. Mr. Daly currently serves on the boards of Catalyst Pharmaceuticals and Opiant Pharmaceuticals.

Mr. Daly was instrumental in building Takeda North America from 14 people to more than 3,000 employees and \$5 billion in sales in less than seven years. During his 13-year tenure, he served as Executive Vice President, U.S., where he was responsible for business development for the Americas and for expanding the company's commercial footprint across North and South America and into new therapeutic areas including oncology. As President of AstraZeneca's U.S. Diabetes subsidiary, Mr. Daly led commercial initiatives that transformed the Bristol-Myers Squibb and AstraZeneca Diabetes Alliance into the fastest-growing diabetes franchise in the U.S. in less than 12 months. Mr. Daly earned an MBA from Northwestern University's Kellogg School of Management and holds a B.S. in microbiology from University of Notre Dame.

**G. Kenneth Lloyd, Ph.D. Dr. CSO.** Lloyd has more than 45 years of experience in the pharmaceutical industry, with a focus on novel drug discovery and development, working in both large pharma (F. Hoffman LaRoche, Synthelabo and Wyeth Ayerst) and start-up biotechs (SIBIA, Nereus). Previous positions include Vice-Director at Synthelabo (now Sanofi), Director of Research at Wyeth U.K. and Chief Scientific Officer at Nereus Pharmaceuticals, where he was responsible for the discovery, selection and development of Plinabulin. In addition to Plinabulin, Dr. Lloyd has led the development of marizomib (proteasome inhibitor for multiple myeloma), progabide and the discovery and early development of zolpidem. Dr. Lloyd received his undergraduate education and M.S. in Biochemistry at McGill University and Ph.D. in Pharmacology and Toxicology from the University of Toronto, followed by a post-doctoral fellowship at F. Hoffmann LaRoche in Basel. He has more than 300 publications in journals that include Science, Nature and the New England Journal of Medicine.

**Gordon L. Schooley, Ph.D. CRO.** Dr. Schooley has 35 years of experience in the pharmaceutical industry, with a focus on clinical and regulatory affairs, and he has been associated with product development and approvals of 19 marketed drugs in the U.S., Europe and Pacific Rim countries. Previous positions include Director of Clinical Research at Allergan, V.P. of Clinical Research & Regulatory Affairs at Newport Pharmaceuticals International, V.P. of Clinical Research & Regulatory Affairs at Alliance Pharmaceutical Corp. and CSO and Senior V.P. of Clinical Development & Regulatory Affairs at Skye Pharma-Pacira Pharmaceuticals. He has participated in multiple product approvals in the U.S., Canada, Australia and Europe, including those for DepoCyte, 5-fluorouracil, Solarize and Alprazolam. He also has experience in oncology, including hepatic carcinoma, neoplastic meningitis and glioblastoma. Dr. Schooley received his undergraduate training and M.S. at Brigham Young University and Ph.D. in Biostatistics and Medical Care Organization & Administration at the University of Michigan, School of Public Health.

**James R. Tonra, Ph.D. SVP Pre-Clinical Development.** After earning a doctorate in Physiology and Biophysics, James R. Tonra, Ph.D. has worked for over 20 years in biotechnology, leading and utilizing in-house, contracted and sponsored research efforts to generate definitive data packages that enable the prioritization of research projects and guide clinical development at Regeneron Pharmaceuticals, Millennium Pharmaceuticals, ImClone Systems/Eli Lilly, and Kadmon Holdings. Dr. Tonra has collaborated with and lead multidisciplinary teams to develop biologic and small molecule drug candidates for disease indications including inflammation, oncology, diabetes, and CNS disorders. He has authored over 40 peer-reviewed publications and is an inventor on numerous use-patents. At ImClone Systems, prior to the successful acquisition by Eli Lilly, Dr. Tonra's efforts significantly contributed to the IND filing and clinical strategy development for 8 novel drugs, 3 of which are now approved therapies for cancer: Cyramza, Portrazza and Lartruvo. Dr. Tonra received his Ph.D. in Physiology and Biophysics from SUNY at Stony Brook and B.S. in Physics, Summa Cum Laude, from SUNY at Stony Brook.

## INVESTMENT SUMMARY

**Bull Case.** Plinabulin stands to challenge the paradigm of immuno-oncology in the treatment of chemotherapy-induced neutropenia and non-small cell lung cancer. Neutropenia is a common condition that affects most patients undergoing chemotherapy, and if left untreated, may increase the risk of life-threatening infection and can disrupt the course of the cancer treatment. The present standard of care uses G-CSF agents, such as Neulasta or Neupogen, to proliferate white blood cells in the bone marrow. These G-CSF treatments had total global sales of \$10B in 2018. Prescription growth is expected to continue to grow sharply and while estimates vary as the impact of generics takes hold, the market is expected to reach \$20B in 2025, despite almost solely being used in just 20% (high risk CIN patients).

As a growth agent, G-CSF has the potential to unintentionally influence cancer cell growth and a well-known side-effect is bone pain. Thus, Plinabulin could gain significant market share with its unique mechanism of action (MoA) by protecting neutrophils and preventing neutropenia prophylactically. The ability to administer Plinabulin as early as 30 minutes after chemotherapy positions the biologic to be used as a first-line defense ahead of G-CSF treatments. Two Phase 2/3 studies are underway, examining Plinabulin for safety, efficacy, and non-inferiority in the treatment of intermediate and high-risk CIN; pivotal data is expected by year end.

Once approved, Plinabulin has the potential to shift the treatment paradigm. Just incremental share from Neulasta/Neupogen, capturing a slice of the untapped intermediate risk CIN patient population, translates into a billion plus opportunity.

Outside of chemotherapy-induced neutropenia treatment, BeyondSpring is pursuing Plinabulin applications for non-small cell lung cancer (NSCLC). Presently approved therapies only show effectiveness in specific tumor mutations and patient response is relatively limited. EGFR wild type patients account for 70%-85% of the total NSCLC population. The four presently available treatments fail to address this majority of patients. Plinabulin in the 2<sup>nd</sup>/3<sup>rd</sup> line of treatment has already proven to improve median overall survival, objective response, and duration of response while decreasing the incidence of severe neutropenia. The Phase 3 trial, which is evaluating Plinabulin in combination with docetaxel as an efficacious treatment for NSCLC, predicts results to be announced in 2H19. As a platform biologic with several attractive anti-cancer indications, Plinabulin has significant market opportunity in both the U.S. and China.

**Bear Case.** For the near term, BeyondSpring is solely dependent on the success of Plinabulin. Less regulatory stringency in China may allow Plinabulin to receive approval in China before U.S. FDA approval. In order to reach the broad China market, Plinabulin will most likely have to sell at a discount to U.S. prices due to the “National Reimbursement List” in China. The price differential could offset the higher volume of Chinese cancer patients, resulting in only moderate revenues. A challenge for BeyondSpring is strategic distribution in the U.S. Capturing market share from current G-CSF treatments, Neulasta and Neupogen represents a barrier. Can BeyondSpring reach the middle 60% of intermediate-risk CIN patients? Capital constraints remain a concern for BeyondSpring.

**Our Take.** We like Plinabulin as we see a very strong product profile with minimum risk. We like BeyondSpring as we see a company well positioned to capture share in China and then in the U.S. and globally. The prophylactic aspect of Plinabulin treatment appears differentiating. While the rate of neutropenia in CIN patients is high, only 20% of patients are considered a high enough risk for treatment with biologics. Plinabulin has the opportunity to change this, as well as offer treatment to the larger intermediate-risk population. Given the size of this population the opportunity here alone is substantial. The ability to prevent neutropenia more effectively and eliminate adverse events associated with Neulasta and Neupogen could establish Plinabulin as a first-line treatment for CIN. Global Phase 3 clinical trials for two indications of Plinabulin are expected to be completed during 2H19. Commercial approval could occur in China first followed by the U.S.

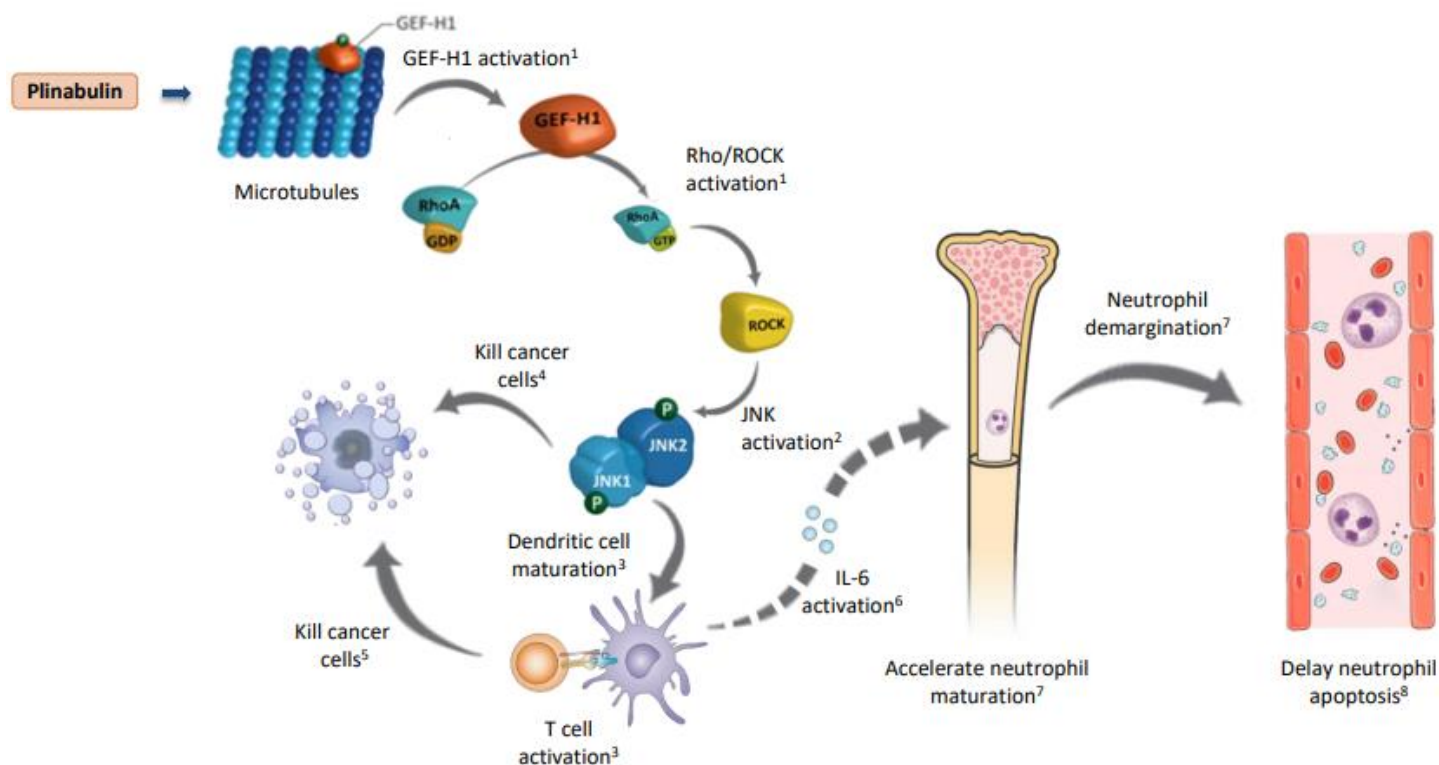
**BeyondSpring Financials.** BeyondSpring recently completed a raise of approximately \$35 million (and maybe larger as a green shoe is likely to be exercised). We note that Plinabulin approval and commercialization is approaching too, possibly as soon as YE19 or 1H20.



**Plinabulin** is a small molecule derived from a natural halamide compound found in marine microorganisms which has numerous biological activities that lead to multiple therapeutic opportunities. It is a naturally derived small molecule and is relatively easy to manufacture. Plinabulin has shown multiple immuno-stimulatory effects in addition to its activities in destabilizing microtubule networks. Plinabulin activates Guanine nucleotide exchange factor, GEF-H1, by depolymerizing the tubulin of which microtubules consist. The activation of GEF-H1 begins a downstream signaling pathway which activates the C-Jun protein by first phosphorylating the Rho-A protein and then JNK1 and 2. The activation of the C-Jun pathway leads to dendritic cell maturation, T-cell activation, and neutropenia prevention.

The C-Jun pathway up regulates the genes CD80, CD86, IL-1 $\beta$ , IL-6, and IL-12. These four proteins are responsible for Plinabulin's therapeutic effects. CD80 and CD86 are responsible for the immune related anti-cancer effects by causing dendritic cell maturation and T-cell activation. CD80 induces T-cell proliferation and cytokine production<sup>1</sup> while CD86 is responsible for the activation of T-cells in the immune response. Increasing the concentration of activated T-cells leads to an increased immune response to cancer cells. Cytokines IL-6, IL-1 $\beta$  and IL-12 are responsible for the neutropenia prevention effects. IL-6 has been shown to prevent neutrophil death due to viral causes<sup>2</sup> and IL-1 $\beta$  prevents neutrophil apoptosis.<sup>3</sup>

**Exhibit 3. Plinabulin is a small molecule which targets GEF-H1.** (A) Plinabulin targets the tubulin which makes up microtubules. The downstream effects of this have immune-related anticancer effects, neutrophil rescue effects, and vascular disruptive effects. (B) Plinabulin activates Guanine nucleotide exchange factor, GEF-H1, by depolymerizing the tubulin of which microtubules consist. The activation of GEF-H1 begins a downstream signaling pathway which leads to dendritic cell maturation, T-cell activation, and neutropenia prevention through the up regulation of the CD80, CD86, IL-1 $\beta$  and IL-6 in dendritic cells.



Note: <sup>1</sup> Chang et al., 2008 Mol Biol Cell; Kashyap et al., 2018 submitted. <sup>2</sup> Zhang et al., 2005 Mol Cell Biol. <sup>3</sup> Keystone Meeting, Mar 2017; Kashyap et al. 2018 submitted. <sup>4</sup> Singh et al., 2011 Blood. <sup>5</sup> Keystone Meeting, Mar 2017; Unpublished findings: University of Basel. <sup>6</sup> Keystone Meeting, Mar 2017. <sup>7</sup> Suwa et al., 2000 Am J Physiol Heart Circ Physiol; Ghosh et al., 2018 ACR Annual Conference; Blayney et al., Society of Leukocyte Biology. <sup>8</sup> Asensi et al., 2004 Infection and Immunity.

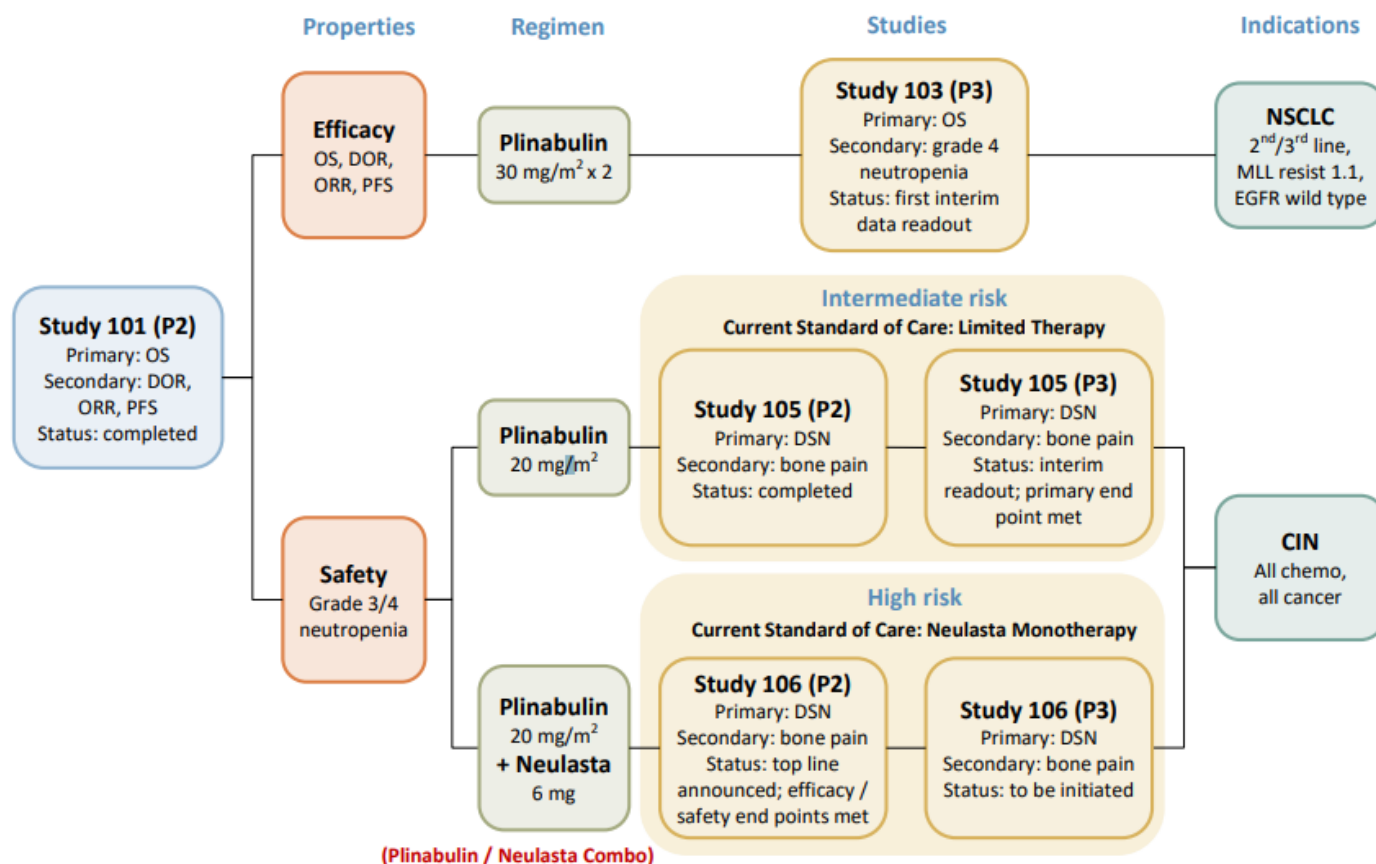
Source: BeyondSpring

<sup>1</sup> <https://www.ncbi.nlm.nih.gov/gene/941>

<sup>2</sup> Dienz, O, et al. "Essential Role of IL-6 in Protection against H1N1 Influenza Virus by Promoting Neutrophil Survival in the Lung." *Mucosal Immunology*, vol. 5, no. 3, Jan. 2011

<sup>3</sup> Prince, Lynne R. et al. "The Role of Interleukin-1 $\beta$  in Direct and Toll-like Receptor 4-Mediated Neutrophil Activation and Survival." *The American Journal of Pathology*, Nov. 2004, pp. 1819–1826.

**Exhibit 4. Most Advanced Indications for Plinabulin: NSCLC and CIN.**



Source: BeyondSpring

**Neutropenia** is a condition that is characterized by a low count of a particular type of white blood cell known as a neutrophil. Neutrophils are the most abundant type of granulocyte found in mammals and are normally found in the blood stream. In the acute phase of an inflammation, particularly due to bacterial infection and some cancers, neutrophils are among the first responders of inflammatory cells to migrate to the site of inflammation. Neutrophils are highly motile cells that can travel to parts of tissue through which other cells cannot. Neutrophils act as a front-line defense against pathogens and cluster around the site of infection, releasing cytokines, which amplify the inflammatory action of other immune cells. Neutrophils are very short lived, with a circulating half-life of six to eight hours. Neutrophils are produced at a rate of between  $5 \times 10^{10}$  and  $10 \times 10^{10}$  to replenish their high concentrations.<sup>4</sup> The diagnosis for neutropenia is determined by calculating the ANC (Absolute Neutrophil Count), which is the number of neutrophils per microliter of blood. The severity of neutropenia is graded on a 1 to 4 scale: Grade 1 is an ANC between 1500 and 2000, Grade 2 is between 1000 and 1500, grade 3 is between 500 and 1000, and Grade 4 is under 500. While Neutropenia does not typically display any symptoms of its own, it leaves patients susceptible to infection. Neutropenia associated with fever, also known as febrile neutropenia (FN), is a condition responsible for more than 60,000 hospitalizations each year with an overall mortality rate of nine to 18%. In untreated cases of severe FN, the 24-hour mortality rate can reach 70%.<sup>5</sup> Even among those who receive treatment for episodes of FN, the in-hospital mortality rate reaches nine-and-a-half percent.<sup>6</sup>

**Chemotherapy-Induced Neutropenia (CIN)** is a common side effect of chemotherapy medications. Chemotherapy destroys rapidly growing cells, and while this targets cancer cells, it also affects blood cells, including neutrophils. Due to the risk of serious infection increasing with the progression of neutropenia, chemotherapy may need to be delayed or the dose may need to be reduced, negatively impacting the cure rates in certain patients. The incidence of CIN varies based on the type of chemotherapy given. A study from the Graduate School of Medicine at the Osaka City University found that patients receiving platinum-based first line regimens have a 25.5% incidence of neutropenia and those on second line regimens using taxanes experience a 33.6 % incidence of neutropenia.<sup>7</sup>

<sup>4</sup> Summers C, Rankin SM, Condliffe AM, Singh NR, Peters AM, Chilvers ER. Neutrophil kinetics in health and disease. Trends in Immunology. 2010;31(8):318–24.

<sup>5</sup> Williams, Mark (2007). *Comprehensive hospital medicine an evidence based approach*. Philadelphia: Saunders Elsevier.

<sup>3</sup> Kuderer, Nicole M. et al. "Mortality, Morbidity, and Cost Associated with Febrile Neutropenia in Adult Cancer Patients." *Cancer* 106.10 (2006).

<sup>7</sup> Hashiguchi Y, Kasai M, Fukuda T, Ichimura T, Yasui T, et al. Chemotherapy-induced neutropenia and febrile neutropenia in patients with gynecologic malignancy. *Anti-Cancer Drugs*. 2015;26:1054–1060.

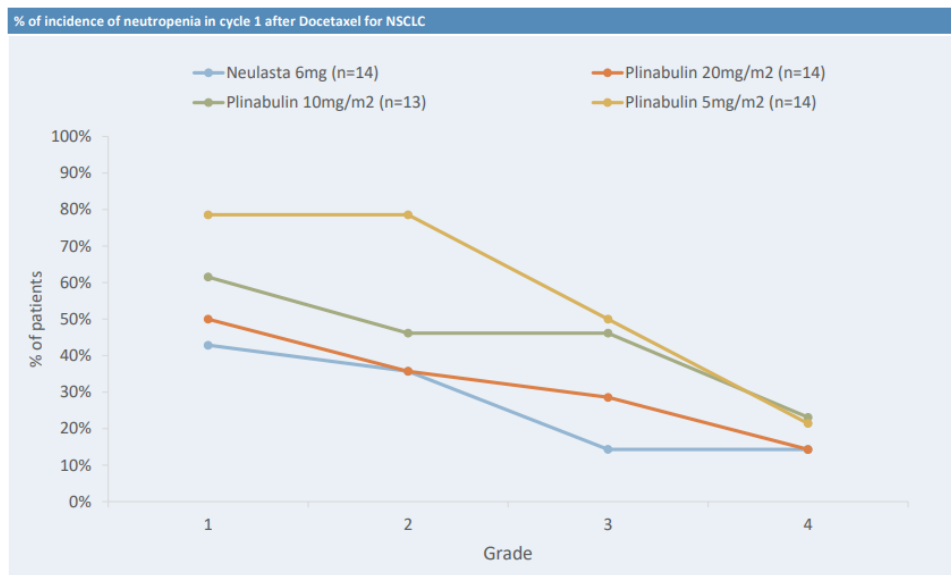
**The current standard of care for chemotherapy-induced neutropenia** is biologic drugs using recombinant G-CSF, a human growth factor which stimulates the proliferation of neutrophils from stem cells in bone marrow. The two G-CSF therapies are filgrastim (Neupogen) and pegfilgrastim (Neulasta); along with biosimilars, these treatments represent \$7.7B in sales. Neupogen is a short-acting version of G-CSF that is administered daily for two weeks following chemotherapy. Neulasta is a long-acting version that is administered once after each chemotherapy cycle. G-CSFs must be administered 24 hours following the administration of chemotherapy in order to be fully effective because the neutrophils generated as a response to G-CSF stimulation are susceptible to destruction by chemotherapy. Additionally, due to the stimulation of neutropenia production in bone marrow, treatment-induced bone pain is experienced by 20% - 40% of patients receiving filgrastim and 25-38% of those receiving pegfilgrastim. G-CSF treatments are a biologic drug and as such they are very expensive, a single shot of Neulasta can be several thousand dollars. With a high risk of mortality from CIN, prevention is emphasized in treatment, however, due to prohibitive side effects and high costs, only the 20% of patients deemed “high risk” are taking prophylactic measures with chemotherapy.

**Docetaxel** is one of the prescribed chemotherapies and is approved for use in breast cancer, lung cancer, NSCLC, head and neck cancer, and prostate cancer. Docetaxel works by stabilizing the microtubules that make up the mitotic spindle in dividing cells. For a normal cell to divide, the mitotic spindle has to depolymerize as the cell moves from metaphase to anaphase. The docetaxel stabilized microtubules prevent the cells from leaving metaphase, leading to cell death. This works particularly well on cancerous cells which are characterized by a high rate of mitosis. Since Neutrophils are also a rapidly produced cell, their concentrations are severely impacted by the action of chemotherapy.

### Clinical Development - Neutropenia

**Phase 2/3 clinical trial** – BeyondSpring is currently conducting two Phase 2/3 studies on Plinabulin for the prevention of chemotherapy-induced severe neutropenia. The two studies are testing for non-inferiority and superiority versus pegfilgrastim. Study 105 is the non-inferiority study comparing patients using docetaxel which places them in the intermediate neutropenia risk group, which is representative of the majority (72%) of chemotherapy patients. The Phase 2 portion of the study compared five, 10, and 20 mg/m<sup>2</sup> doses to determine the PK/PD data and determined the ideal dose for the Phase 3 portion of the study at 20 mg/m<sup>2</sup>. BeyondSpring began enrollment in April 2017 and enrolled approximately 105 patients. The primary endpoint is non-inferiority compared to the standard of care treatment (Neulasta), using the measure of average days in severe neutropenia (DSN). This was met at interim analysis in 1H19. We now expect the equivalent of an NDA filing in China by the end of 2019.

### Exhibit 5. Study 105 (Phase 2): Incidence of Neutropenia with Plinabulin vs Neulasta.

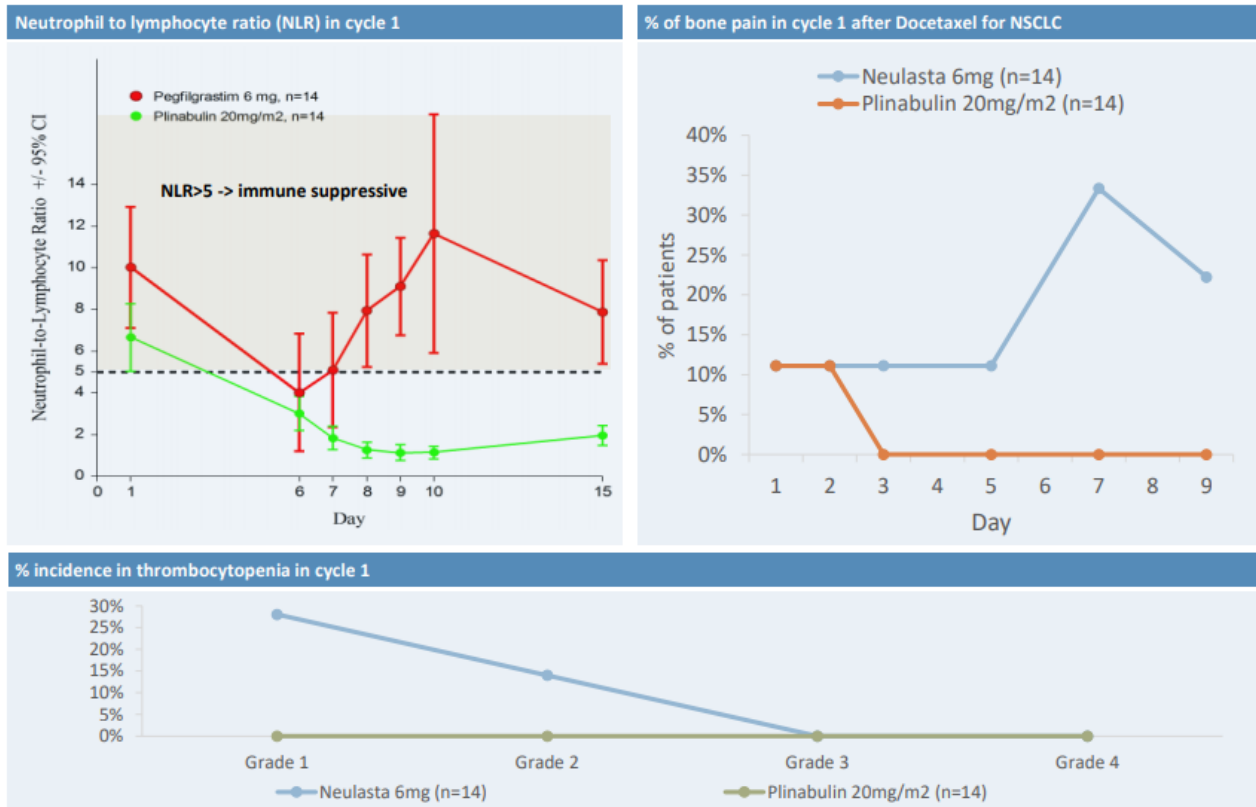


Source: BeyondSpring



Study 106 – Superiority. This study compares patients using a combination chemotherapy treatments (known as TAC), which is representative of ~20% of chemotherapy patients with a high risk of neutropenia. The design of this study is similar to Study 105, with efficacy and safety met in Phase 2 while establishing the recommended dose for Phase 3. Approximately 300 patients have been enrolled in the double blinded Phase 3 study to test non-inferiority, as well as superiority in DSN. Final readout can be expected by the end of 2019 to support the broad indications of Plinabulin.

**Exhibit 6. Study 105 (Phase 2): Superior Safety Profile of Plinabulin vs Neulasta.**



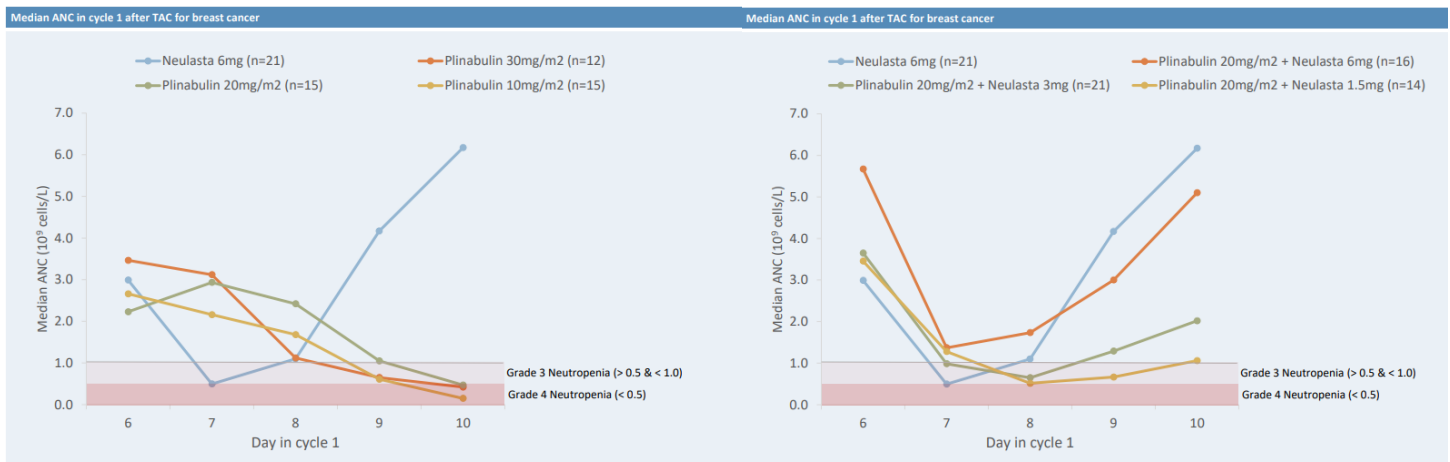
Source: BeyondSpring

**Exhibit 7. Study 105 (Phase 2): Clear Superiority Profile of Plinabulin against Neulasta.**

Plinabulin demonstrates a clear superiority profile in cycle 1 after Docetaxel for NSCLC		
	Neulasta	Plinabulin 20mg/m <sup>2</sup>
DSN (grade 4)	0.5 day	0.5 day
% neutropenia (grade 4)	14%	14%
% bone pain	Yes	No from day 3
Thrombocytopenia	Yes	No
Immune suppression	Yes	No
Anti-cancer	No	Yes

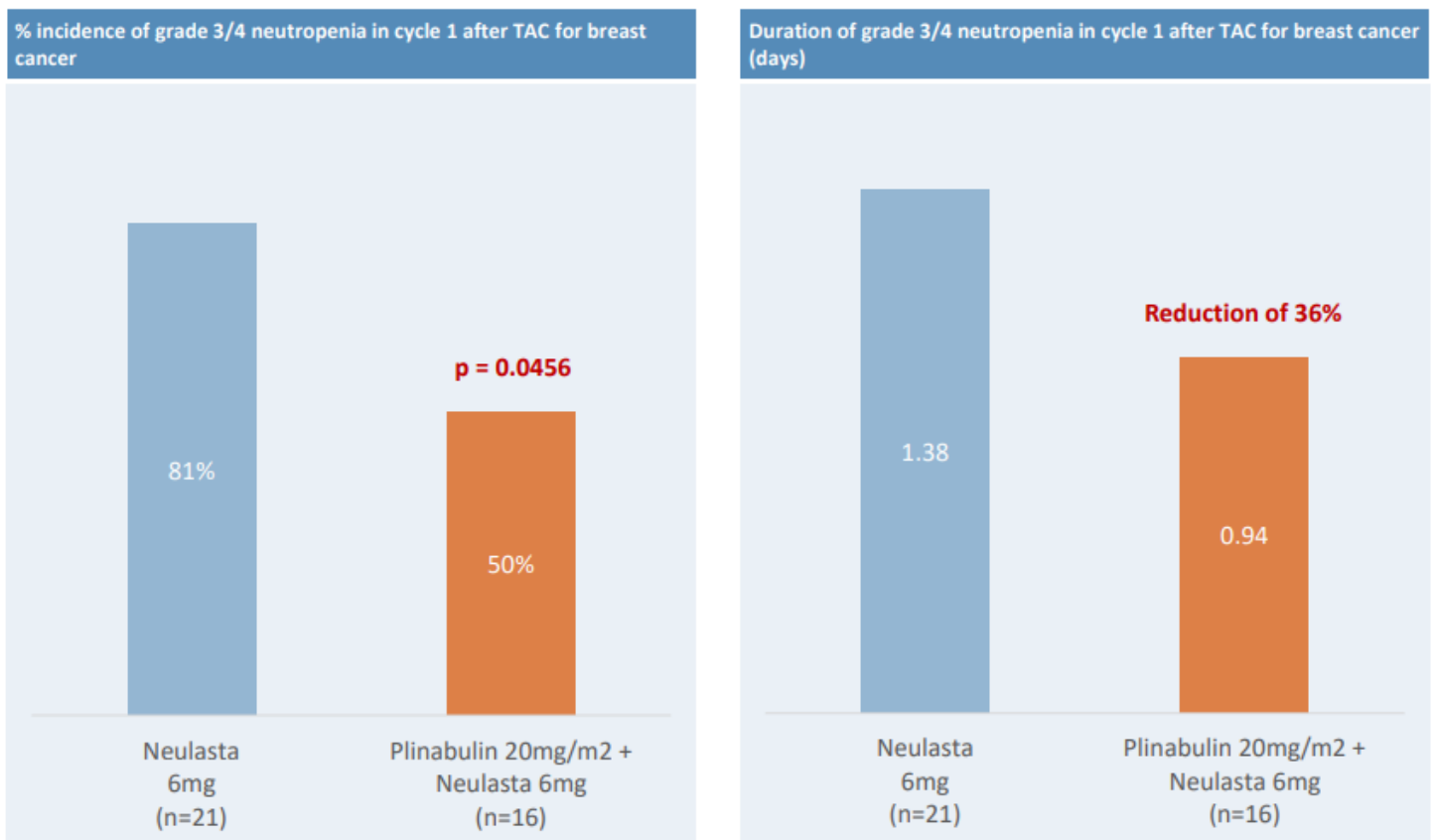
Source: BeyondSpring

**Exhibit 8. Study 106 (Phase 2): Plinabulin vs Neulasta and Plinabulin Combined with Neulasta.** As a preventative and protective biologic, Plinabulin maintains a higher absolute neutrophil count (ANC) in patients after chemotherapy when compared against Neulasta alone. Without any additionally treatment, the ANC in patients treated with Plinabulin eventually reach Grade 3 and Grade 4 Neutropenia levels. The ANC profile of patients treated with a combination of Plinabulin and Neulasta is enhanced. The Plinabulin dosage protects neutrophils from reaching critical levels while Neulasta restores ANC levels to normal by promoting rapid production.



Source: BeyondSpring

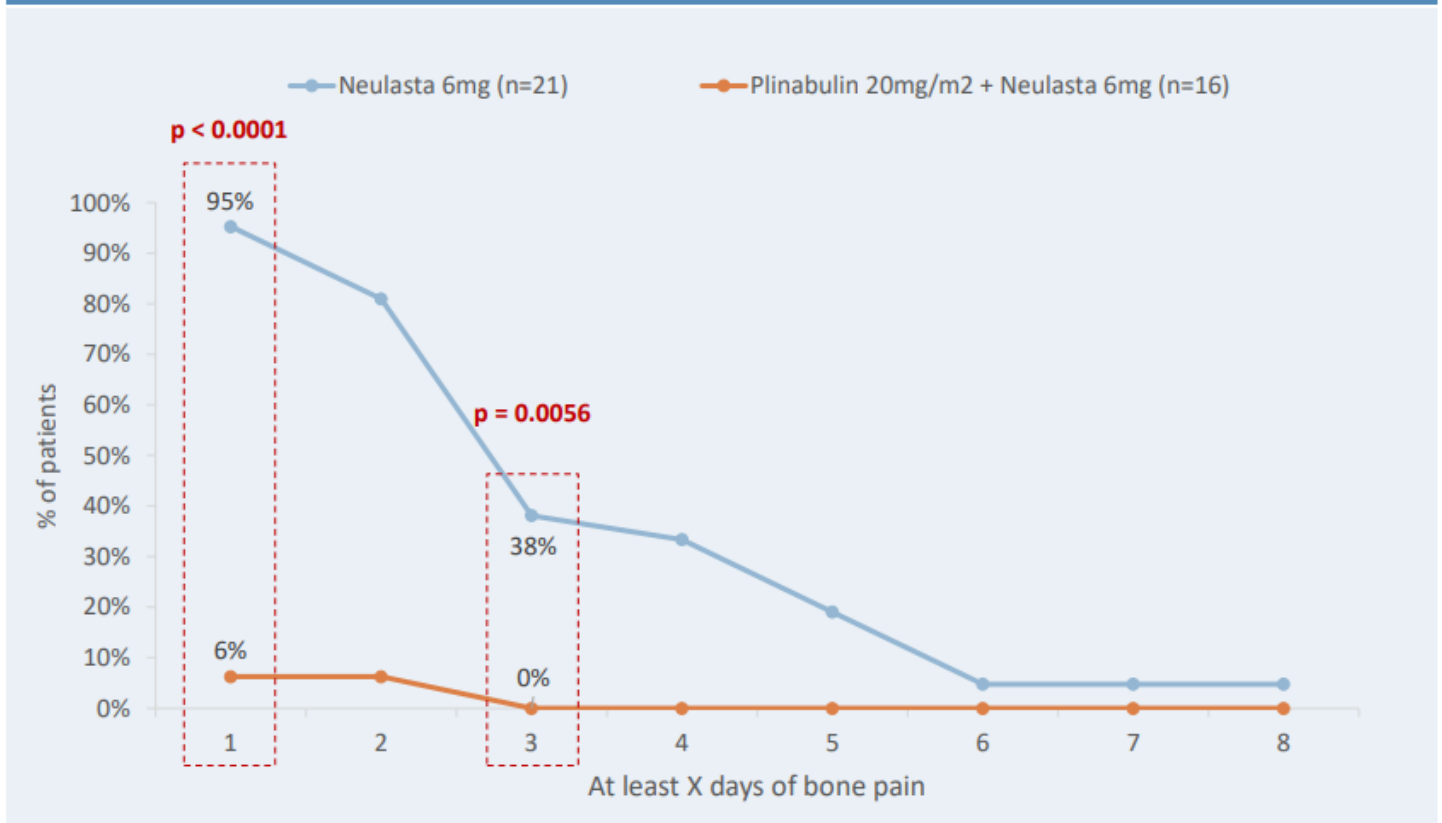
**Exhibit 9. Study 106 (Phase 2): Plinabulin/Neulasta Combination Shows Positive Efficacy Data.**



Source: BeyondSpring

**Exhibit 10. Study 106 (Phase 2): Plinabulin/Neulasta Combination Shows Positive Safety Data.**

At least X days of bone pain in cycle 1 after TAC for breast cancer



Source: BeyondSpring

## Clinical Development - NSCLC

**NSCLC**, or non-small cell lung cancer, is the most common type of lung cancer, responsible for 87% of lung cancer cases. Lung cancer is a global health problem with 1.8 million cases worldwide and approximately 225,000 cases in the U.S. of which ~190,000 will be non-small cell. The prognosis for lung cancer patients is poor with a five-year survival rate of only 17.7%. Lung cancer is typically diagnosed relatively late in its course after metastasizing to other tissue and therefore will require systemic care.

**The standard of care for advanced NSCLC** begins with broad chemo-toxic drugs such as cisplatin, however, the average increase in survival is only about two months. Additional treatments include other chemotherapies such as docetaxel, tyrosine kinase inhibitor that target intercellular enzymes with specific mutations in genes (such as EGFR kinases), agents that disrupt blood vessels formation in tumors, or immune checkpoint inhibitors such as nivolumab. These treatments all have specific limitations. Docetaxel leads to neutropenia in up to 40% of patients. Kinase inhibitors that target EGFR are only effective in 10% of cases where the mutation is present and can eventually lead to resistance to the medication. Checkpoint inhibitors show promising results but are only effective in a small subset of cases. Despite the availability of multiple drugs, there is still a large portion of patients whose needs are unmet.

**Plinabulin** is believed to help fight NSCLC through two effects of its mechanism of action. The first is its immune-enhancing effect, which causes dendrite maturation to occur faster. The second is the vascular disruptive effect caused by the disruption of the tubulin networks in cells lining blood vessels in tumors.

**Phase 1/2 clinical trial** – The purpose of the Phase 2 portion of the Phase 1/2 trial was to evaluate the anticancer effects of Plinabulin in combination with docetaxel versus docetaxel monotherapy alone. The trial contained 163 patients with unresectable, locally advanced, or metastatic cancers and compared the duration of survival between the docetaxel alone arm and the docetaxel plus Plinabulin cohort. Though the trial did not meet the primary end point for a statistically significant increase in overall survival, a subset of patients with measurable lung tumors was identified with a possible increase in overall survivability. In the subset analysis, the docetaxel plus Plinabulin cohort arm had a median overall survival of 11.3 months versus 6.7 months for docetaxel alone. Additionally, the 95% confidence level for the median overall survival in the docetaxel alone arm was 6.0 to 9.8 months, while the docetaxel plus Plinabulin survival period was between 6.7 and 15.1 months. The overall response rate was improved from 10.5% on the docetaxel alone to 18.4% for docetaxel plus Plinabulin.

**Exhibit 11. Study 101 (Phase 2): Plinabulin Safety Summary.** In studying over 500 patients treated with Plinabulin and docetaxel, there has been no exhibited adverse effects within the two-year follow-up period. Observed adverse events (AEs) were decreased in targeted areas of neutropenia and leukopenia when compared to treatments of docetaxel alone. Increases in specific AEs were dose-dependent and manageable.

Grade 3/4 Adverse Event (AE) as % in patients	Plinabulin 20mg/m <sup>2</sup> (2 doses) + docetaxel 75mg/m <sup>2</sup> (n=40)	Plinabulin 30mg/m <sup>2</sup> (2 doses) + docetaxel 75mg/m <sup>2</sup> (n=50)	Docetaxel 75mg/m <sup>2</sup> (n=73)
Nausea (N)	0	4	0
Vomiting (V)	0	4	1
Diarrhea (D)	5	8	6
Constipation	0	0	1
Anorexia	3	0	0
Fatigue	3	4	10
Asthenia	13	2	4
Arthralgia	0	0	0
Myalgia	0	2	0
Headache	3	0	0
Dizziness	0	0	0
Dyspnea	5	4	14
Cough	0	0	0
Alopecia	0	0	0
Hypokalemia	5	0	1
Anemia	5	8	2
Leukopenia	0	2	9
Neutropenia	5	8	26
Pyrexia	0	0	2
Tachycardia	0	0	0
Transient Hypertension (TH)	5	20	0

Increased AE
Reduced AE

Source: BeyondSpring

**Exhibit 12. Current Therapies vs. Plinabulin for NSCLC.** The subgroups targeted by Plinabulin include EGFR wild type and PD-L1, for which there are limited treatment options. EGFR wild type means that there is no EGFR mutation detected. This particular subgroup is responsible for 70% of Asian NSCLC cases and 90% of Western Cases. PD-L1 is a subgroup which does not respond to PD-1 antibodies and consists of 50% of NSCLC cases. This gives Plinabulin a 35-45% market for NSCLC where the patient is both EGFR wild type and PD-L1.

**Only four treatments are currently approved: docetaxel, pemetrexed, ramucirumab and PD-1**

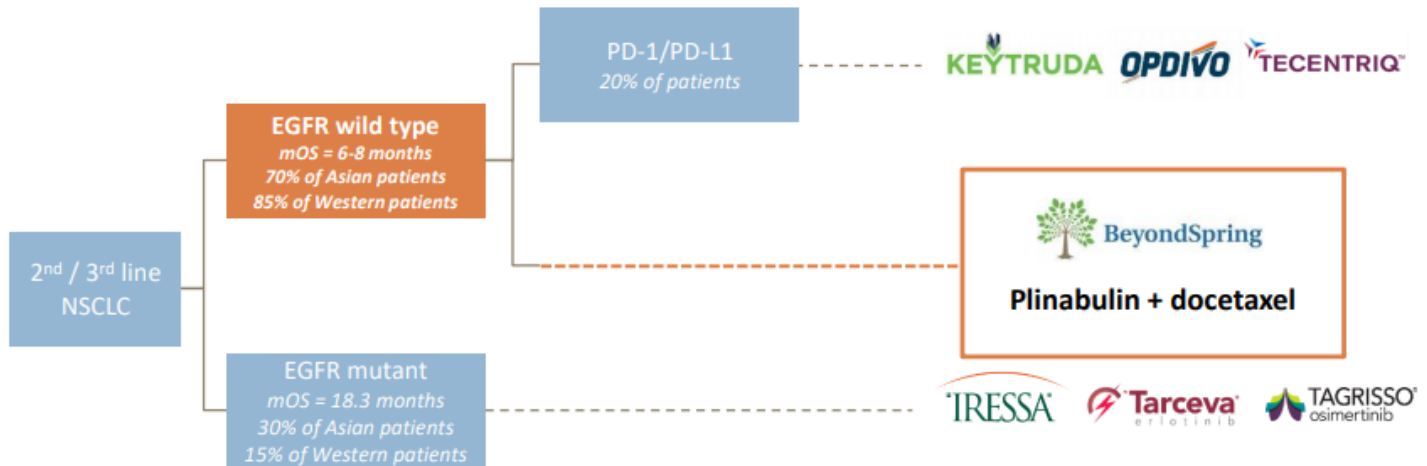
	Moving into 1 <sup>st</sup> line		2 <sup>nd</sup> & 3 <sup>rd</sup> lines	
	Nivolumab (PD-1) vs. docetaxel <sup>1</sup>	Pemetrexed vs. docetaxel <sup>2</sup>	Ramucirumab + docetaxel vs. docetaxel <sup>3</sup>	Plinabulin + docetaxel vs. docetaxel
mOS	+2.8 months (12.2 vs. 9.4)	+0.4 months (8.3 vs. 7.9)	+1.4 months (10.5 vs. 9.1)	+4.6 months (11.3 vs. 6.7)
ORR	19% vs. 12%	9.1% vs. 8.8%	23% vs. 14%	18.4% vs. 10.5%
Grade 3/4 neutropenia	0% vs. 27%	5% vs. 40%	49% vs. 39%	7% vs. 26%
DOR	17 vs. 6 months	4.6 vs. 5.3 months		12.7 vs. 1 months
	80% patients refractory to PD-1/PD-L1	Approved based on low grade 3/4 neutropenia	Approved based on 1.4 months OS benefit	Study 101: Phase 2 data

Source: BeyondSpring



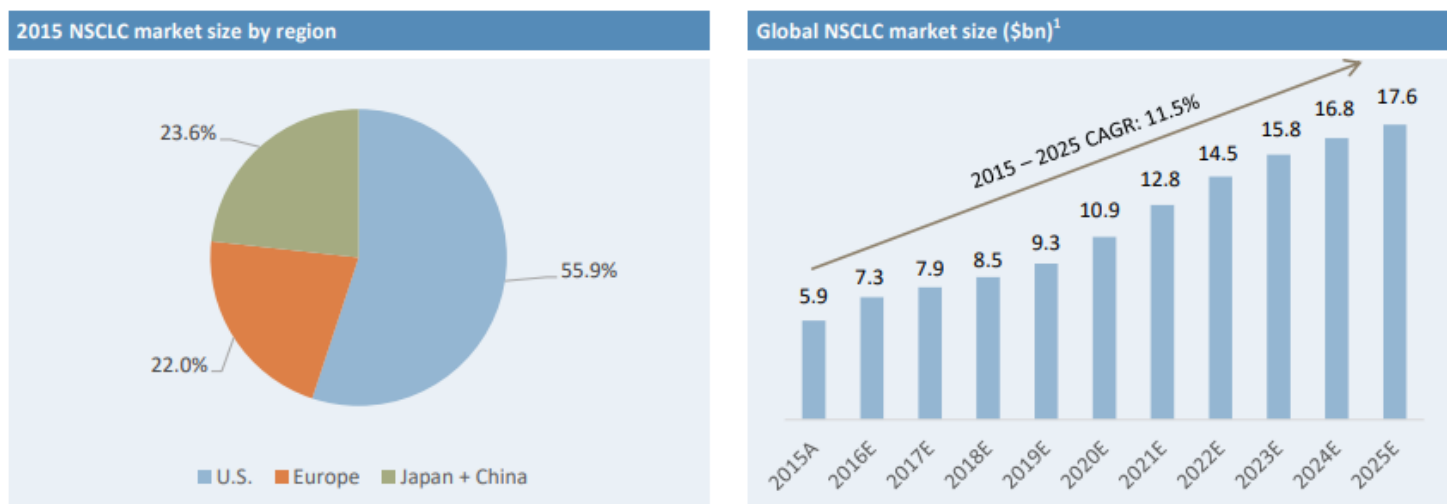
**Phase 3 Clinical Trial** – Study 103 is a randomized single blinded trial of 550 advanced NSCLC patients with at least one measurable lung lesion. Enrollment eligibility included only patients who express EGFR wild type and have previously failed a platinum-based chemotherapy treatment in order to achieve the primary endpoint of overall survival using a combination of Plinabulin and docetaxel. First interim data analysis has been completed subsequent to a final readout expected later in 2019.

**Exhibit 13. NSCLC Market Opportunity for Plinabulin.** Plinabulin's market opportunity extends to particular subgroups in the lung cancer treatment market. The market is fragmented with multiple approved therapies which provide modest survival benefits due to their mutation-specific effectiveness, limited response in many patients, and unique safety risks across therapeutic modalities.



Source: BeyondSpring

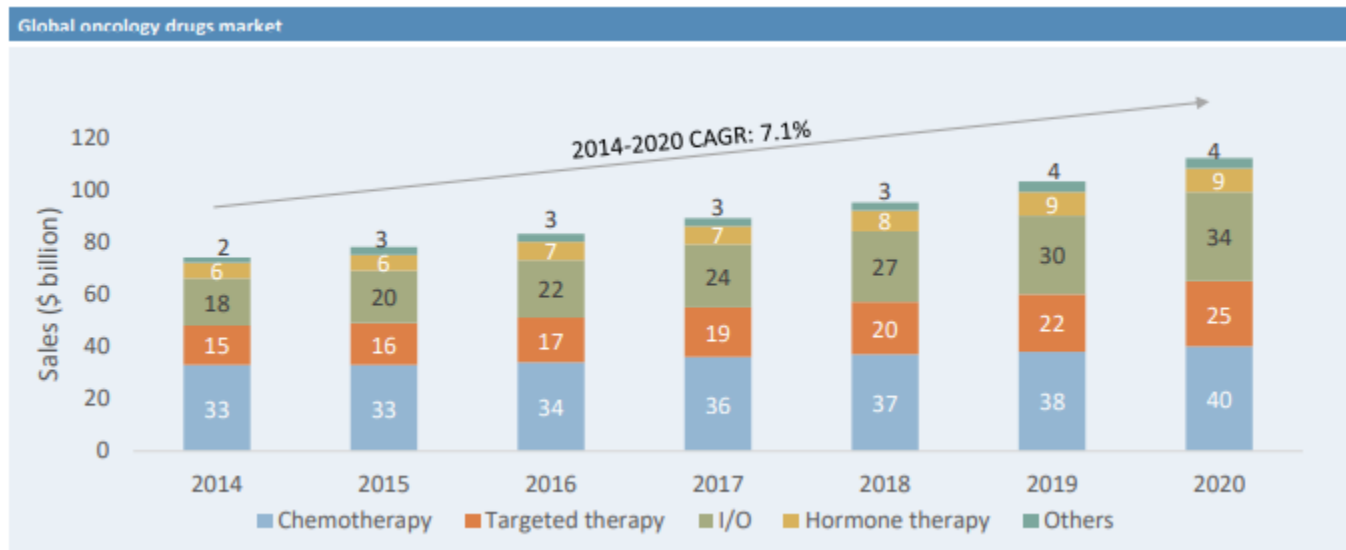
**Exhibit 14. NSCLC Market Breakdown and Projections.** Lung cancer is the most prevalent form of cancer in the world, with over 2.1 million cases globally. Approximately 87% of those diagnoses account for non-small cell lung cancer (NSCLC). The increasing incidences of NSCLC annually, combined with the high prices of checkpoint inhibitor therapies, is driving significant growth in the NSCLC market. Almost a third of patients globally reside in China, which resulted in \$445M of revenues in 2015; projections suggest the market to be worth \$4.3B in 2025.



Source: BeyondSpring

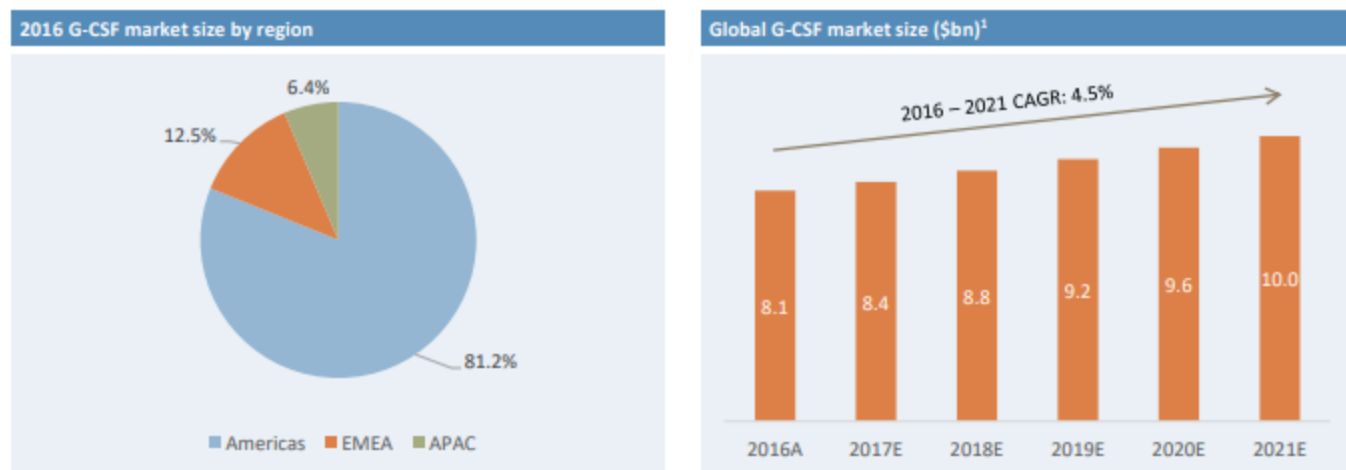
## Commercial Market Potential

**Exhibit 15. Historic and Projected Growth of Global Oncology Market.** As the total sales of the oncology market globally increases at an average compounded annual growth rate (CAGR) of 7.1%, the size of the chemotherapy segment can be expected to continually represent the largest share of the overall market. New cases of cancer are forecasted to reach 23.6 million by 2030. The accelerated increase in necessary chemo treatments will drive the growth of CIN therapies to improve patient care.



Source: BeyondSpring

**Exhibit 16. Growth of Neutropenia Market.** Globally, the market for neutropenia therapies has been ruled by Amgen's products Neulasta and Neupogen. These branded biologics account for over 75% of the overall G-CSF sales. Although there are over 650,000 patients receiving chemotherapy per year in the U.S., China represents a potentially larger market opportunity for CIN therapies granted over 4 million new cancer patients being diagnosed per year. Neulasta has not been approved in China, paving the way for a Plinabulin based treatment to replace the generic G-CSF mainly sold in the region.



Source: BeyondSpring

**MODELING ASSUMPTIONS**

1. We assume Plinabulin will receive approval for both CIN and NSCLC in 2020 in both the U.S. and China for conservatism.
2. Based on the clinical profile of Plinabulin, we assume it will capture 5% of the U.S. market for CIN and 8% of the total CIN treatment market in China, given the competitions from current SOC and biosimilars coming to the market. However, our estimates could be proven conservative.
3. We assume a \$20,000 annual cost of treatment in the U.S. with a 2% price increase. We also assume a significant price reduction in China with no price increase as we expect Plinabulin will be included in the National Reimbursement List.
4. Our therapeutic model has not yet factored in potential revenues from Plinabulin in combination with Nivolumab given it is still in the early development stage.

**Exhibit 17. Chemotherapy-Induced Neutropenia Market Model (U.S.)**

2nd/3rd Line NSCLC (US)	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E
Incidence of Lung Cancer (US)	224,731	225,854	226,983	228,118	229,259	230,405	231,557	232,715	233,879	235,048	236,223	237,404
Number of Cases NSCLC (87%)	195,516	196,493	197,476	198,463	199,455	200,453	201,455	202,462	203,474	204,492	205,514	206,542
Patients with second-line disease (80%)	156,412	157,195	157,981	158,770	159,564	160,362	161,164	161,970	162,780	163,593	164,411	165,233
Patients with measurable lesions (70%)	109,489	110,036	110,586	111,139	111,695	112,253	112,815	113,379	113,946	114,515	115,088	115,663
Patients with EGFR wild-type (85%)	93,065	93,531	93,998	94,468	94,941	95,415	95,893	96,372	96,854	97,338	97,825	98,314
<b>Market Share</b>		1%	3%	5%	7%	8%	9%	10%	11%	11%	11%	11%
Number of Patients Treated		935	2,820	4,723	6,646	7,633	8,630	9,637	10,654	10,707	10,761	10,815
Cost of Treatment	\$	25,000	\$	25,500	\$	26,010	\$	27,061	\$	28,154	\$	29,291
Increase in Price		2%		2%		2%		2%		2%		2%
Revenues ('000)		23,383	71,909	122,856	176,316	206,561	238,214	271,326	305,950	313,630	321,502	329,571
Risk adjustment		0%		0%		0%		0%		0%		0%
<b>Total Revenue ('000)</b>	<b>\$</b>	<b>23,383</b>	<b>\$</b>	<b>71,909</b>	<b>\$</b>	<b>176,316</b>	<b>\$</b>	<b>238,214</b>	<b>\$</b>	<b>313,630</b>	<b>\$</b>	<b>329,571</b>

Source: Dawson James estimates

**Exhibit 18. Chemotherapy-Induced Neutropenia Market Model (China)**

Chemotherapy-Induced Neutropenia (US)	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E
Patients receiving chemotherapy in the U.S.	656,516	659,799	663,098	666,413	669,745	673,094	676,460	679,842	683,241	686,657	690,091	693,541
Increase in Incidence	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
High/Moderate Risk of Neutropenia (90%)	590,865	593,819	596,788	599,772	602,771	605,785	608,814	611,858	614,917	617,992	621,082	624,187
<b>Market Share</b>		0.5%	1%	1.5%	2%	2.5%	3%	4%	5%	5%	5%	5%
Number of Patients Treated	-	2,969	5,968	8,997	12,055	15,145	18,264	24,474	30,746	30,900	31,054	31,209
Cost of Treatment	\$	20,000	\$	20,400	\$	21,224	\$	22,082	\$	22,974	\$	23,433
Increase in Price		2%		2%		2%		2%		2%		2%
Revenues ('000)		59,382	121,745	187,201	255,866	327,860	403,308	551,241	706,346	724,076	742,250	760,880
Risk adjustment		0%		0%		0%		0%		0%		0%
<b>Total Revenue ('000)</b>	<b>\$</b>	<b>59,382</b>	<b>\$</b>	<b>121,745</b>	<b>\$</b>	<b>327,860</b>	<b>\$</b>	<b>551,241</b>	<b>\$</b>	<b>724,076</b>	<b>\$</b>	<b>760,880</b>

Source: Dawson James estimates

**Exhibit 19. NSCLC Market Model (U.S.)**

NSCLC (China)	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E
Patients with lung cancer in China	831,765	858,381	885,849	914,197	943,451	973,641	1,004,798	1,036,951	1,070,134	1,104,378	1,139,718	1,176,189
Number of Cases NSCLC (80%)	665,412	686,705	708,679	731,357	754,761	778,913	803,838	829,561	856,107	883,502	911,774	940,951
Patients with second-line disease (80%)	532,329	549,364	566,944	585,086	603,809	623,130	643,071	663,649	684,886	706,802	729,420	752,761
Patients with measurable lesions (70%)	372,631	384,555	396,861	409,560	422,666	436,191	450,149	464,554	479,420	494,761	510,594	526,933
EGFR Wild Type (70%)	260,841	269,188	277,802	286,692	295,866	305,334	315,105	325,188	335,594	346,333	357,416	368,853
<b>Market Share</b>		1%	4%	5%	6%	7%	8%	9%	10%	10%	10%	10%
Number of Patients Treated		2,692	11,112	14,335	17,752	21,373	25,208	29,267	33,559	34,633	35,742	36,885
Cost of Treatment	\$	6,000	\$	6,000	\$	6,000	\$	6,000	\$	6,000	\$	6,000
Revenues ('000)		16,151	66,673	86,008	106,512	128,240	151,250	175,601	201,356	207,800	214,449	221,312
60% Ownership Interest		9,691	40,004	51,605	63,907	76,944	90,750	105,361	120,814	124,680	128,670	132,787
Risk adjustment		0%		0%		0%		0%		0%		0%
<b>Total Revenue ('000)</b>	<b>\$</b>	<b>9,691</b>	<b>\$</b>	<b>40,004</b>	<b>\$</b>	<b>63,907</b>	<b>\$</b>	<b>105,361</b>	<b>\$</b>	<b>124,680</b>	<b>\$</b>	<b>132,787</b>

Source: Dawson James estimates

**Exhibit 20. NSCLC Market Model (China)**

Incidence of cancer in China	4,378,269	4,422,052	4,466,272	4,510,935	4,556,044	4,601,605	4,647,621	4,694,097	4,741,038	4,788,449	4,836,333	4,884,696
Increase in Incidence	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Patients Undergoing Chemotherapy (25%)	1,094,567	1,105,513	1,116,568	1,127,734	1,139,011	1,150,401	1,161,905	1,173,524	1,185,260	1,197,112	1,209,083	1,221,174
High/Moderate Risk of Neutropenia (90%)	985,111	994,962	1,004,911	1,014,960	1,025,110	1,035,361	1,045,715	1,056,172	1,066,734	1,077,401	1,088,175	1,099,057
<b>Market Share</b>		0.5%	2%	3%	4%	5%	6%	7%	8%	8%	8%	8%
Number of Patients Treated		4,975	20,098	30,449	41,004	51,768	62,743	73,932	85,339	86,192	87,054	87,925
Cost of Treatment	\$	6,000	\$	6,000	\$	6,000	\$	6,000	\$	6,000	\$	6,000
Revenues ('000)		29,849	120,589	182,693	246,026	310,608	376,457	443,592	512,032	517,152	522,324	527,547
60% Ownership Interest		17,909	72,354	109,616	147,616	186,365	225,874	266,155	307,219	310,291	313,394	316,528
Risk adjustment		0%		0%		0%		0%		0%		0%
<b>Total Revenue ('000)</b>	<b>\$</b>	<b>17,909</b>	<b>\$</b>	<b>72,354</b>	<b>\$</b>	<b>147,616</b>	<b>\$</b>	<b>266,155</b>	<b>\$</b>	<b>310,291</b>	<b>\$</b>	<b>316,528</b>

Source: Dawson James estimates

**Valuation.** Our therapeutic model assumes Plinabulin launches in both the U.S. and China in 2020. We assume modest market share numbers, but these could prove to be conservative. We apply a 30% discount rate (r) in our FCFF, discounted EPS and sum-of-the-parts (SOP) models. For cash flow positive companies with high visible earnings we typically use 10% but for companies dependent on one product, not yet approved, we use the higher rate, 30%. Our three valuation models are equal weighted and averaged and rounded to the nearest whole number to derive our \$39.00 price target.

### Exhibit 21. Free Cash Flow Model.

Average	39
Price Target	54
Year	2020

#### DCF Valuation Using FCF (mln):

Units ('000)	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E
EBIT	(45,000)	52,628	238,010	390,380	544,932	683,390	827,590	1,039,751	1,261,181	1,290,093	1,319,709	1,350,047
Tax Rate	0%	2%	5%	5%	10%	18%	28%	29%	30%	32%	32%	32%
EBIT (1-t)	(45,000)	51,576	226,109	370,861	490,439	560,380	595,865	738,223	882,827	877,263	897,402	918,032
CapEx	(92)	(101)	(111)	(122)	(135)	(148)	(163)	(179)	(197)	(9)	(57)	(194)
Depreciation	46	55	66	80	96	115	138	165	198	119	97	163
Change in NWC												
FCF	(45,046)	51,530	226,064	370,818	490,400	560,346	595,840	738,209	882,828	877,373	897,442	918,001
PV of FCF	(58,560)	51,530	173,896	219,419	223,213	196,193	160,477	152,939	140,693	107,557	84,628	66,590
Discount Rate		30%										
Long Term Growth Rate		1%										
Terminal Cash Flow	3,197,178											
Terminal Value YE2030	231,917											
NPV	1,750,492											
NPV-Debt												
Shares out ('000)	32,441	2030E										
NPV Per Share	54											

Source: Dawson James estimates

### Exhibit 22. Discounted-EPS Model.

Current Year	2020
Year of EPS	2030
Earnings Multiple	15
Discount Factor	30%
Selected Year EPS	28
NPV	30

Source: Dawson James estimates

Discount Rate and Earnings Multiple Varies, Year is Constant							
Earnings Multiple		5%	10%	15%	20%	25%	30%
	1	17.12	10.75	6.89	4.50	2.99	2.02
	5	85.59	53.75	34.46	22.52	14.97	10.11
	10	171.17	107.50	68.92	45.03	29.94	20.23
	15	256.76	161.25	103.38	67.55	44.91	30.34
	20	342.35	215.00	137.84	90.06	59.88	40.45
	25	427.94	268.75	172.30	112.58	74.85	50.56
	30	513.52	322.50	206.76	135.10	89.82	60.68
	35	599.11	376.25	241.23	157.61	104.79	70.79

### Exhibit 23. Sum-of-the-Parts Model.

BeyondSpring Pharmaceuticals	LT Gr	Discount Rate	Yrs to Mkt	% Success	Peak Sales (MMs)	Term Val
<b>Plinabulin NSCLC (US)</b>	1%	30%	2	70%	\$330	\$1,136
NPV						\$6
<b>Plinabulin Chemo-Induced-Neutropenia (US)</b>	1%	30%	1	70%	\$761	\$2,624
NPV						\$17
<b>Plinabulin NSCLC (China)</b>	1%	30%	2	70%	\$133	\$458
NPV						\$2
<b>Plinabulin Chemo-Induced-Neutropenia (China)</b>	1%	30%	1	70%	\$317	\$1,091
NPV						\$7
Net Margin						40%
MM Shrs OS (2030E)						32
<b>Total</b>						<b>\$33</b>

Source: Dawson James estimates

**Risk Analysis**

**Investment Risk:** BeyondSpring is an early stage biotechnology company currently with a high expenditures rate and no revenues. A significant element of the company's valuation is associated with its lead clinical candidate Plinabulin. As such, clinical progress with this compound represents the key risk for the company and shareholders.

**Clinical and Regulatory Risk:** There are no assurances that BeyondSpring's products will be approved in China, the U.S., or other markets.

**Commercial Risk:** There can be no assurances that the pipeline products will be commercialized, and even if they receive regulatory approval, there is a risk that BeyondSpring will not be able to secure a commercial partner in the China market or launch Plinabulin successfully through its own sales force in China.

**Financial Risk:** BeyondSpring has a high burn rate and is currently not a profitable company. The company is likely to raise additional capital. There can be no promises that the company will be able to raise the needed capital or that the terms of such, are favorable.



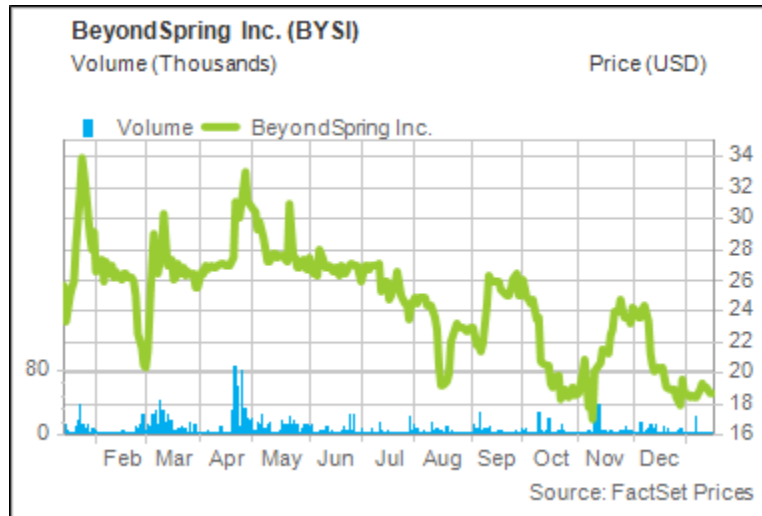
**Exhibit 24. Income Statement**

BeyondSpring Pharmaceuticals: Income Statement (\$'000)																					
: YE December 31	2018A	1Q19A	2Q19E	3Q19E	4Q19E	2019E	1Q20E	2Q20E	3Q20E	4Q20E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E	2029E	2030E
Revenue:																					
Revenue from NSCLC (US)		-	-	-	-	-	5,378	5,612	6,079	6,313	23,383	71,909	122,856	176,316	206,561	238,214	271,326	305,950	313,630	321,502	329,571
Revenue from Chemotherapy-Related Neutropenia (US)		-	-	-	-	-	13,658	14,252	15,439	16,033	59,382	121,745	187,201	255,866	327,860	403,308	551,241	706,346	724,076	742,250	760,880
Revenue from NSCLC (China)		-	-	-	-	-	2,229	2,326	2,520	2,617	9,691	40,004	51,605	63,907	76,944	90,750	105,361	120,814	124,680	128,670	132,787
Revenue from Chemotherapy-Related Neutropenia (China)		-	-	-	-	-	4,119	4,298	4,656	4,836	17,909	72,354	109,616	147,616	186,365	225,874	266,155	307,219	310,291	313,394	316,528
Total Product Sales	-	-	-	-	-	-	25,384	26,488	28,695	29,798	110,365	306,011	471,277	643,705	797,731	958,147	1,194,083	1,440,330	1,472,676	1,505,816	1,539,767
Total royalties, collaborative revenue	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Revenue	-	-	-	-	-	-	25,384	26,488	28,695	29,798	110,365	306,011	471,277	643,705	797,731	958,147	1,194,083	1,440,330	1,472,676	1,505,816	1,539,767
Expenses:																					
Costs of Goods Sold	-	-	-	-	-	-	2,538	2,649	2,869	2,980	11,036	30,601	47,128	64,370	79,773	95,815	119,408	144,033	147,268	150,582	153,977
%COGS							10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
Research and Development	51,618	6,330	8,400	9,100	11,170	35,000	7,521	7,848	8,502	8,829	32,700	22,000	17,600	17,424	17,250	17,077	16,906	16,737	16,570	16,404	16,240
%R&D	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
General and Administrative	5,927	1,639	2,400	2,600	3,361	10,000	3,220	3,360	3,640	3,780	14,000	15,400	16,170	16,979	17,318	17,664	18,018	18,378	18,746	19,121	19,503
%SG&A	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
	5,927																				
Total Expenses	57,545	7,969	10,800	11,700	14,531	45,000	13,279	13,857	15,011	15,589	57,736	68,001	80,898	98,773	114,341	130,556	154,333	179,148	182,583	186,106	189,720
Operating Income (Loss)	(57,545)	(7,969)	(10,800)	(11,700)	(14,531)	(45,000)	12,104	12,631	13,683	14,210	52,628	238,010	390,380	544,932	683,390	827,590	1,039,751	1,261,181	1,290,093	1,319,709	1,350,047
Foreign exchange gain (loss), net	(455)	173																			
Interest income	211	6																			
Interest expense	315	(37)																			
Loss on disposal of property and equipment																					
Net loss on equity method investment																					
Total Other Income	71	142	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pretax Income	(57,474)	(7,827)	(10,800)	(11,700)	(14,531)	(45,000)	12,104	12,631	13,683	14,210	52,628	238,010	390,380	544,932	683,390	827,590	1,039,751	1,261,181	1,290,093	1,319,709	1,350,047
Non Controlling Interest																					
Income tax benefit	-	-	-	-	-	-	242	253	274	284	1,053	11,900	19,519	54,493	123,010	231,725	301,528	378,354	412,830	435,504	445,516
Tax Rate							2%	2%	2%	2%	2%	5%	5%	10%	18%	28%	29%	30%	32%	33%	33%
GAAP Net Income (Loss)	(57,474)	(7,827)	(10,800)	(11,700)	(14,531)	(45,000)	11,862	12,378	13,410	13,925	51,576	226,109	370,861	490,439	560,380	595,865	738,223	882,827	877,263	884,205	904,532
Net loss attributable to noncontrolling interests	(2,605)	(534)																			
GAAP Net Income (Loss)	(54,869)	(7,293)	(10,800)	(11,700)	(14,531)	(45,000)	11,862	12,378	13,410	13,925	51,576	226,109	370,861	490,439	560,380	595,865	738,223	882,827	877,263	884,205	904,532
GAAP-EPS	(2.42)	(0.32)	(0.45)	(0.47)	(0.56)	(1.83)	0.45	0.40	0.43	0.45	1.72	7.23	11.80	15.55	17.69	18.74	23.12	27.54	27.26	27.37	27.88
GAAP-EPS (Dil)	(2.42)	(0.32)	(0.45)	(0.47)	(0.56)	(1.83)	0.45	0.40	0.43	0.45	1.72	7.23	11.80	15.55	17.69	18.74	23.12	27.54	27.26	27.37	27.88
Wgt'd Avg Shrs (Bas) - '000s	22,665	23,029	24,052	25,076	26,102	24,565	26,128	31,154	31,185	31,216	29,921	31,294	31,420	31,545	31,672	31,799	31,926	32,054	32,182	32,311	32,441
Wgt'd Avg Shrs (Dil) - '000s	22,665	23,029	24,052	25,076	26,102	24,565	26,128	31,154	31,185	31,216	29,921	31,294	31,420	31,545	31,672	31,799	31,926	32,054	32,182	32,311	32,441

Source: Dawson James estimates

## **Important Disclosures:**

### **Price Chart:**



### **Price target and ratings changes over the past three years:**

Initiated – Buy – August 16, 2019 – Price Target \$26.00

Dawson James Securities, Inc. (the “Firm”) is a member of the Financial Industry Regulatory Authority (“FINRA”) and the Securities Investor Protection Corporation (“SIPC”).

The Firm does not make a market in the securities of the subject company(s). The Firm has NOT engaged in investment banking relationships with BYSI in the prior twelve months, as a manager or co-manager of a public offering and has NOT received compensation resulting from those relationships. The Firm may seek compensation for investment banking services in the future from the subject company(s). The Firm has NOT received any other compensation from the subject company(s) in the last 12 months for services unrelated to managing or co-managing of a public offering.

Neither the research analyst(s) whose name appears on this report nor any member of his (their) household is an officer, director or advisory board member of these companies. The Firm and/or its directors and employees may own securities of the company(s) in this report and may increase or decrease holdings in the future. As of July 31, 2019, the Firm as a whole did not beneficially own 1% or more of any class of common equity securities of the subject company(s) of this report. The Firm, its officers, directors, analysts or employees may affect transactions in and have long or short positions in the securities (or options or warrants related to those securities) of the company(s) subject to this report. The Firm may affect transactions as principal or agent in those securities.

Analysts receive no direct compensation in connection with the Firm's investment banking business. All Firm employees, including the analyst(s) responsible for preparing this report, may be eligible to receive non-product or service specific monetary bonus compensation that is based upon various factors, including total revenues of the Firm and its affiliates as well as a portion of the proceeds from a broad pool of investment vehicles consisting of components of the compensation generated by investment banking activities, including but not limited to shares of stock and/or warrants, which may or may not include the securities referenced in this report.

Although the statements in this report have been obtained from and are based upon recognized statistical services, issuer reports or communications, or other sources that the Firm believes to be reliable, we cannot guarantee their accuracy. All opinions and estimates included in this report constitute the analyst's judgment as of the date of this report and are subject to change without notice.

**Information about valuation methods and risks can be found in the “STOCK VALUATION” and “RISK ANALYSIS” sections of this report.**

The securities of the company discussed in this report may be unsuitable for investors depending on their specific investment objectives and financial position. This report is offered for informational purposes only and does not constitute an offer or solicitation to buy or sell any securities discussed herein in any jurisdiction where such would be prohibited. Additional information is available upon request.

**Ratings Definitions:**

- 1) **Buy:** the analyst believes the price of the stock will appreciate and produce a total return of at least 20% over the next 12-18 months;
- 2) **Neutral:** the analyst believes the price of the stock is fairly valued for the next 12-18 months;
- 3) **Sell:** the analyst believes the price of the stock will decline by at least 20% over the next 12-18 months and should be sold.

The following chart reflects the range of current research report ratings for all companies followed by the analysts of the Firm. The chart also reflects the research report ratings relating to those companies for which the Firm has performed investment banking services.

	<b>Company Coverage</b>		<b>Investment Banking</b>	
<b>Ratings Distribution</b>	<b># of Companies</b>	<b>% of Total</b>	<b># of Companies</b>	<b>% of Totals</b>
Market Outperform (Buy)	43	84%	13	30%
Market Perform (Neutral)	8	16%	0	0%
Market Underperform (Sell)	0	0%	0	0%
<b>Total</b>	<b>51</b>	<b>100%</b>	<b>13</b>	<b>25%</b>

**Analyst Certification:**

The analyst(s) whose name appears on this research report certifies that 1) all of the views expressed in this report accurately reflect his (their) personal views about any and all of the subject securities or issuers discussed; and 2) no part of the research analyst's compensation was, is, or will be directly or indirectly related to the specific recommendations or views expressed by the research analyst in this research report; and 3) all Dawson James employees, including the analyst(s) responsible for preparing this research report, may be eligible to receive non-product or service specific monetary bonus compensation that is based upon various factors, including total revenues of Dawson James and its affiliates as well as a portion of the proceeds from a broad pool of investment vehicles consisting of components of the compensation generated by investment banking activities, including but not limited to shares of stock and/or warrants, which may or may not include the securities referenced in this report.