Bio-Path Holdings

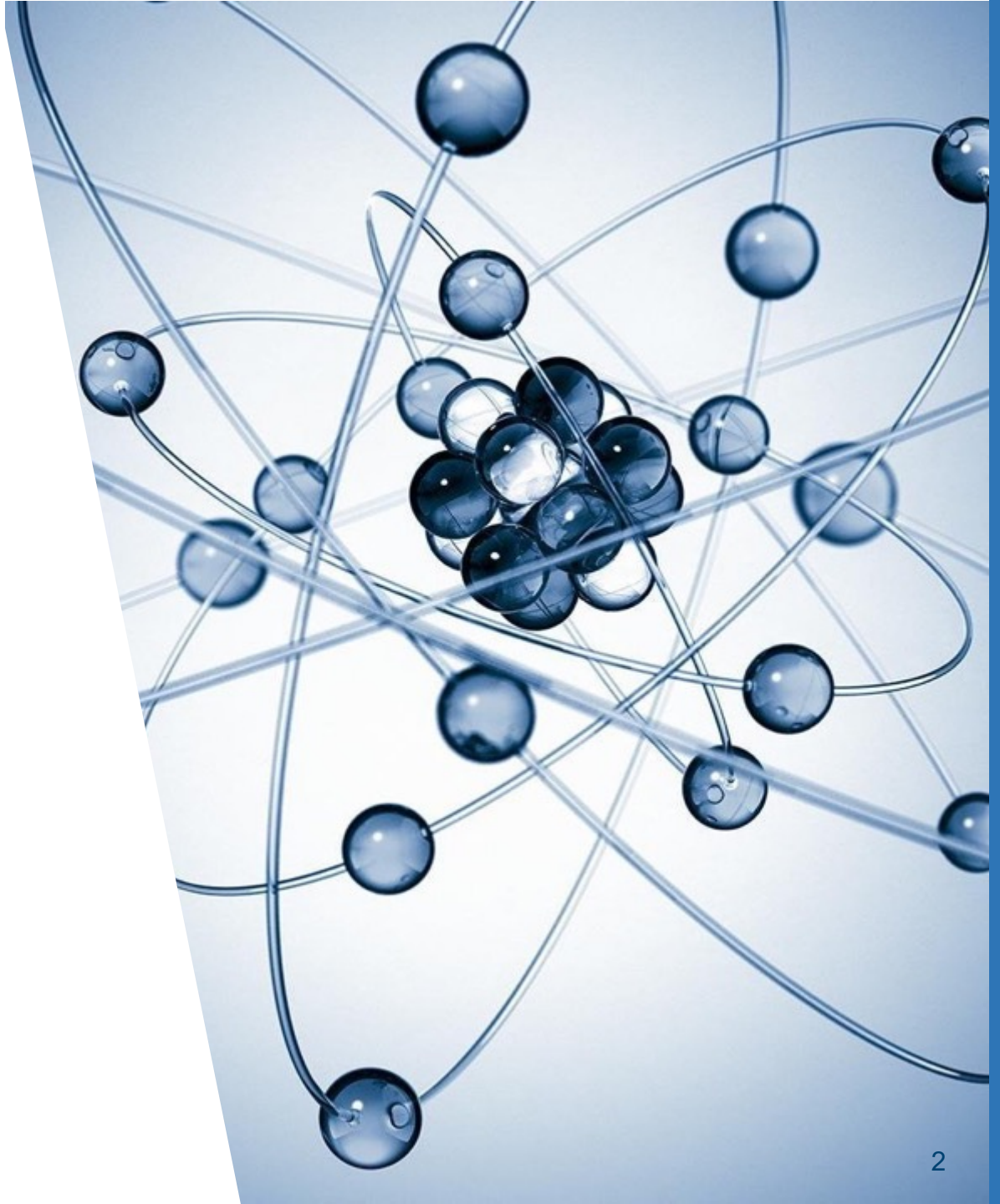
An Oncology-Focused
Biotechnology Company

January 2020

Forward looking statements

This Presentation contains forward-looking statements with respect to business conducted by Bio-Path Holdings, Inc. By their nature, forward-looking statements and forecasts involve risks and uncertainties because they relate to events and depend on circumstances that will occur in the future.

The Company does not undertake to update any forward-looking statements. There are a number of factors that could cause actual results and developments to differ materially and investors should use their own judgment to evaluate risks.



Introducing

Bio-Path Holdings

Advanced Oligonucleotide Therapeutics with High Efficiency Systemic Delivery

Publicly traded
NASDAQ
BPTH

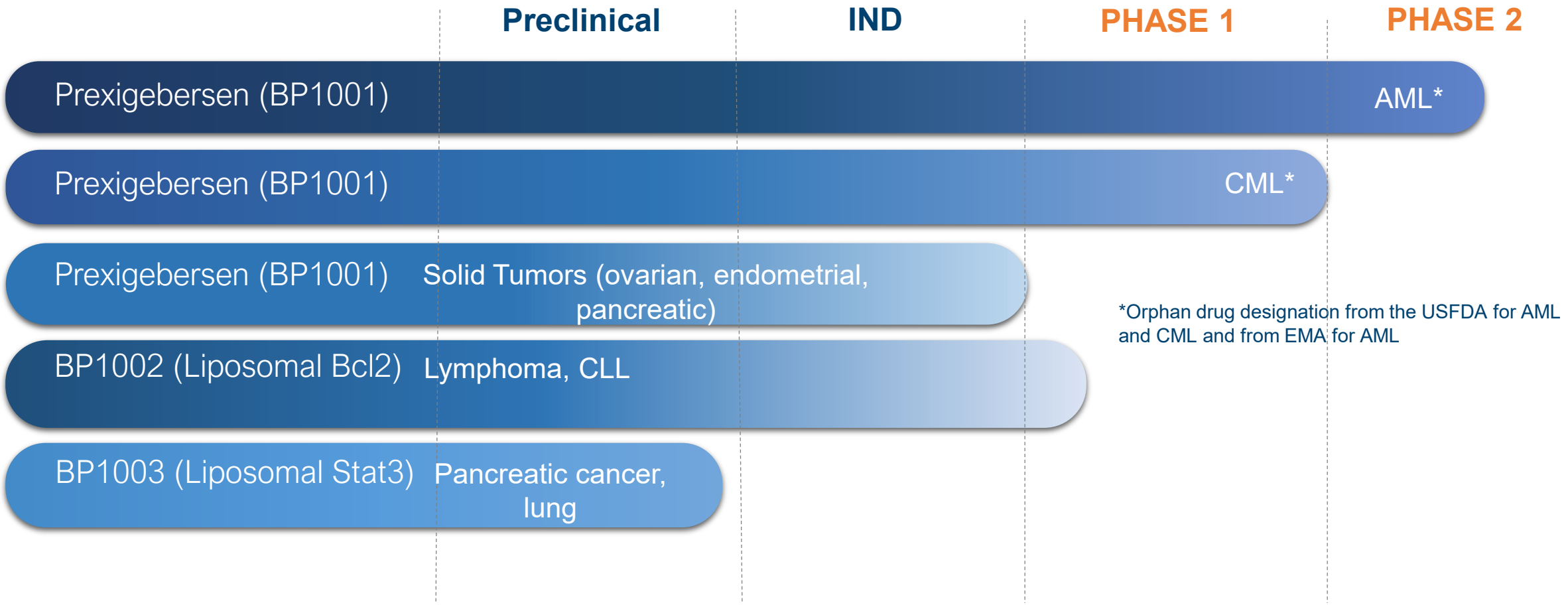
Employees, Contract & Consultants
14

Established
Houston, TX
2007

Technology Highlights

DNAbilize® Technology, next generation single-stranded DNA antisense
Robust clinical pipeline with novel oncology targets

Robust Oncology Pipeline



*Orphan drug designation from the USFDA for AML and CML and from EMA for AML

DNAbilize® Technology

Proven As Safe, Robust and Targeted Method for Treating Disease

No Toxicity

With human patients to date in prexigebersen clinical trial.

- DNAbilize™ liposome structure is similar to the cellular membrane
- P-ethoxy DNA does not induce hepatotoxicity or thrombocytopenia

Systemic Treatment

I.V. delivery to the main organs via blood flow.

High Cellular Uptake

Liposome structure is similar to the cellular membrane enhancing cellular uptake.

Nanoparticle Liposomes

Enable penetration into tumors for delivery of drug.

Proven Target Inhibition

Demonstrated that DNAbilize® method inhibits target protein, proving delivery technology works.

No Toxicity

Systemic Treatment

High Cellular uptake

Nanoparticle liposomes

Proven target inhibition

DNAbilize® Technology

Compared to other Antisense

	1st Generation	2nd Generation	DNAbilize®
No toxicity			✓ ✓
Systemic Delivery			✓ ✓
Target Specific	✓	✓	✓ ✓
Effectiveness	✓	✓	✓ ✓
High Cellular Uptake			✓ ✓
Neutral charged stabilizing DNA backbone			✓ ✓

Unlike other antisense technologies that demonstrate toxicities and poor cellular delivery, **DNAbilize®** technology enables the development and delivery of **systemic** antisense RNAi nanoparticle treatments for a **broad spectrum** of cancers and other diseases.

Phase 1 Conclusions

Results support that Grb2 is a potential therapeutic target for haematological malignancies

- Favorable safety profile strongly suggests that prexigebersen has a very different toxicity profile than other antisense oligonucleotide analogues, which have been associated with serum transaminase activation, thrombocytopenia, and activated partial thrombin time prolongation.
- The tolerability of BP1001 may prove useful in clinical combination settings
- Results published in The Lancet Haematology with Expert Commentary

The Lancet Haematology

"Liposomal Grb2 antisense oligodeoxynucleotide (BP1001) in patients with refractory or relapsed haematological malignancies: a single-centre, open-label, dose-escalation, phase 1/1b trial."

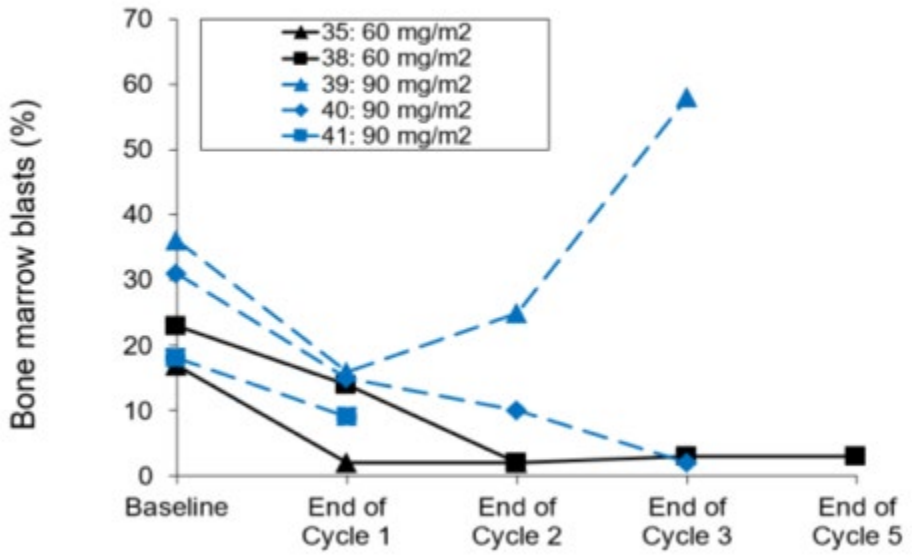
Volume 5, No. 4, e136–e146, April 2018

Stage 1 of the Phase 2 Efficacy Trial Design for AML Prexigebersen Combination Therapy

- Treatment of untreated AML patients who are induction therapy ineligible and unfit for stem cell transplant
- Efficacy trial conducted at 6 leading cancer centers in the U.S., including the MD Anderson Cancer Center
- Primary Endpoint: # patients who achieve CR, (accepted surrogate endpoint)

With this Phase 2 design, plans for a pivotal trial would be discussed with FDA if the Interim Analysis significantly exceed current therapy

Safety Segment Phase 2 Prexigebersen
+ LDAC Combination Therapy Showed Excellent Results



Relapsed/refractory AML patients

- 3 evaluable patients per cohort, 2 cohorts, n=6
- Dose 60 mg/m^2 and 90 mg/m^2 respectively
- Received drug 2x week for 4 weeks per treatment cycle

Results

- 3 patients achieved **CR** (and 2 were eligible for bone marrow transplant)
- 2 patients achieved **50% or greater bone marrow blast reduction with stable disease**
- Average age of Patients was 73.5 years old
- No Adverse Effects attributed to prexigebersen
- No MTD reached

Patient	BP1001 (mg/m^2)	BM Blasts % Reduction	Cycles completed	Response
35	60	88	1	CR
37	60	0	1	PD
38	60	91	5	CR
39	90	56	3	SD w/ ≥50% bmb reduction
40	90	68	3	CR
41	90	50	3	SD w/ ≥50% bmb reduction

71% average reduction bone marrow blasts in responding patients

Results of Stage 1 Interim Analysis

Patient evaluation summary

5 Patients achieved CR (30%)
Note: LDAC alone CR rate 7-13%

6 Patients achieved stable disease (35%)

2 Stable disease patients had >50% bone marrow blasts reductions

1 CR patient was eligible for and received a bone marrow transplant

Of the evaluable patients 65% showed some form of response, including CR and stable disease, to the combination treatment

Importantly no toxicity associated with prexigebersen

Based on the recommendations of the study PIs, protocol amendments are being made for Stage 2 in the ongoing study

- A cohort of refractory/resistant AML patients will be added
- High risk Myelodysplastic Syndrome (MDS) patients will be added
- LDAC cohort to be discontinued
- Result is 2 cohort trial with untreated AML/high risk MDS & refractory/resistant AML/MDS
- Triple combination treatment of prexigebersen/decitabine/venetoclax

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Prexigebersen-A Phase 1 Study in Solid Tumors

- Prexigebersen efficacy against ovarian tumors enhanced when combined with paclitaxel
- Prexigebersen in combination with gemcitabine efficacious against pancreatic tumors
- Clinical Plans
  - Open a Phase 1 study of prexigebersen in patients with advanced or recurrent solid tumors, including ovarian and uterine, pancreatic and breast cancer
  - Second - open Phase 1b studies of prexigebersen + paclitaxel in recurrent ovarian or endometrial tumors and prexigebersen + gemcitabine in patients with metastatic pancreatic tumors
- Bio-Path re-engineered the oligo drug product in prexigebersen with the intent to reduce nanoparticle size for use in solid tumors

BP1002 – A Phase 1 Study in Lymphoma and CLL

- BP1002 is an RNAi antisense nanoparticle targeting Bcl-2
- BP1002 decreased viability of lymphoma cells (11 of 15 lymphoma cell lines)
- By blocking Bcl-2 protein expression, BP1002 allows chemotherapy and radiation to activate apoptosis
- BP1002 extended survival of mice bearing lymphoma xenografts
- Focus in CLL will be on patients who have relapsed on venetoclax treatment

BP1003 Targeting STAT3

- BP1003 has efficacy against non-small cell lung cancer, AML, and pancreatic cancer cells
- BP1003 + gemcitabine combination is efficacious in pancreatic cancer-derived tumors in animals
- IND enabling studies during 2020
- Submit a new IND in 2020
- Conduct a Phase 1 study of BP1003 in patients with refractory/metastatic solid tumors (pancreatic, non-small cell lung cancer, colorectal)

Experienced Leadership Team

Peter Nielsen

Co-Founder, President, Chief Executive Officer and Chief Financial Officer

Officer and Director since founding Company in 2007

Manufacturing development and evolution of engineered product design

Michael Hickey

Director Clinical Program Management

20+ years experience across all phases of drug development

Point of escalation Amgen for South East regional CRO monitoring

Ana Tari Ashizawa, PhD, MBA

Sr Vice President, Research, Development & Clinical Design

Key member of the research team that developed our liposomal delivery technology

Anthony Price, MBA

Sr Vice President, Finance, Accounting & Administration

Former Associate Director of Accounting and Finance at Lexicon Pharmaceuticals

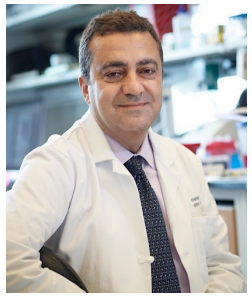
Scientific Advisory Board

Jorge Cortes, M.D.
Chairman

- Director, Cancer Center at Augusta University
- Georgia Research Alliance Eminent Scholar in Cancer
- Formerly, Jane and John Justin Distinguished Chair in Leukemia Research, Chief of the AML and CML sections, and Deputy Chair of the Department of Leukemia at The University of Texas MD Anderson Cancer Center

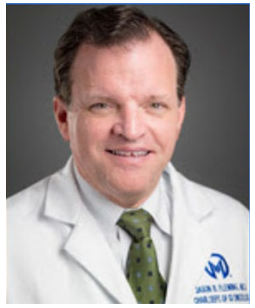
D. Craig Hooper, Ph.D.

- Professor of Cancer Biology and Neurological Surgery and the Section Chief for Translational Research, Tumor Division, in the Department of Neurological Surgery at Thomas Jefferson University
- His work has led to novel immune therapies for rabies infection, neuro-inflammation, and cancer with 10 issued U.S. patents and 19 international patents that have been licensed to five companies in the U.S. and abroad
- He is the founding president of the Jefferson Chapter of the National Academy of Inventors and a fellow of the National Academy of Inventors.



Anas Younes, M.D.

- Professor and chief of the Memorial Sloan Kettering's Lymphoma Service. He has an extensive background in translational scientific research with a particular interest in targeted therapies.
- More than 20 years career at M.D. Anderson Cancer Center, most recently as director of clinical and translational medicine in the Department of Lymphoma and Myeloma.
- Medical degree from the University of Damascus School of Medicine. He completed his internal medicine residency training at SUNY Downstate Medical Center and his pathology residency at the Medical College of Ohio. He completed his hematology fellowship training at Memorial Sloan Kettering.



Jason B. Fleming, M.D., F.A.C.S.

- Newly appointed Chair of the Department of Gastreroenterology at H. Lee Moffitt Cancer Center and Research Institute.
- Professor with tenure in the Department of Surgical Oncology at the University of Texas MD Anderson Cancer Center in Houston.
- Served as as chief of Pancreas Surgery and executive director of Perioperative Services and created the first xenograft program in gastrointestinal cancer.
- Received the Castle Connolly Top Doctor award every year since 2013
- President's Faculty Recognition Award for Outstanding Contribution to the University of Texas MD Anderson Cancer Center in 2016.

IP and Financial Snapshot

Intellectual Property

- Original patents licensed from MD Anderson
- New composition and methods of use patent issued covers DNAbilize® technology, solely owned by Bio-Path
  - Second patent issued for composition and methods with additional claims granted
  - Five additional patents pending

Financial Snapshot

- **Ticker:** NASDAQ: BPTH
- **Cash:** $20 million
- **Market Cap:** $30 million 1/2/2020
- **Burn rate:**
  - Approximately $2 million per quarter

Accomplishments in 2019

- Second patent issued broadening claims of our composition and methods of use technology
- Raised approximately $30 million in cash in four separate registered offerings
- Filed resale registration statement on Form S-1 for shares of common stock underlying certain warrants
- Poster for our third drug candidate results in pancreatic, non-small cell lung and AML cancers presented at the American Association Cancer Research annual meeting
- Major revision to prexigebersen Phase 2 clinical development plan in AML
- First patient dosing in the amended AML trial announced in August 2019
- Successful completion of safety testing of prexigebersen and decitabine combination in AML/MDS patients announced Nov 2019
- Filed an IND for Bio-Path's second drug candidate for BP1002 with the FDA for lymphoma and chronic lymphoblastic leukemia that was cleared by the FDA to proceed with the Phase 1 clinical trial
- Filed an IND for Bio-Path's lead drug candidate prexigebersen in solid tumors
- Assessed Contract Research Organization (CRO) in place and replaced with a new CRO
- Upgraded clinical organization and hired new Director of Clinical Program Management
- Added research scientist to enable faster development of drug candidates using Bio-Path's technology
- Added a new member to the Board having extensive pharma contacts and business development experience
- Renewed shelf registration under NASDAQ rules enabling the future offering/sale of common stock
- ***December 2018*** market value of stock $2-3 million, cash on hand $1 million, ***December 2019*** cash $20 million, market value of stock $30 million

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Thank you

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