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Developing Well-Differentiated Antibiotics

June 2017

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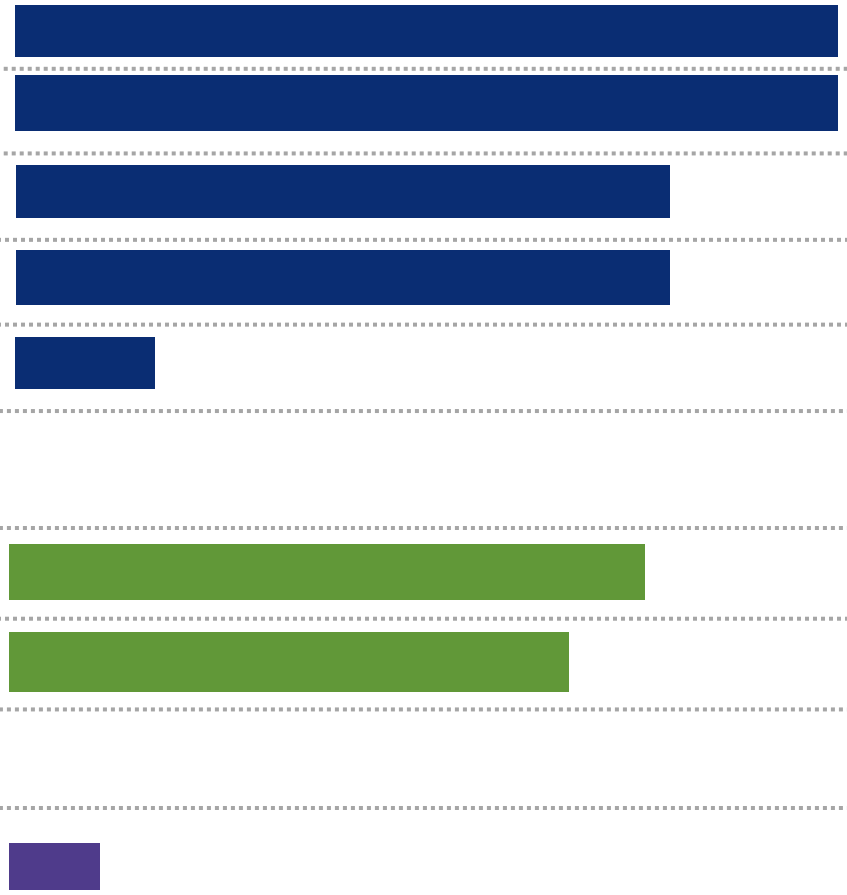
Chief Financial Officer

Forward Looking Statements

This presentation contains forward-looking statements regarding future events. These statements are just predictions and are subject to risks and uncertainties that could cause the actual events or results to differ materially. These risks and uncertainties include, among others: our ability to address the issues identified by the FDA in the complete response letter relating to our new drug applications for solithromycin as a treatment for community acquired bacterial pneumonia; our ability to realize the cost savings of our recently initiated cost and personnel reductions; our ability to obtain FDA and foreign regulatory approval of solithromycin for community acquired bacterial pneumonia; our ability to identify and enter into strategic business transactions; our ability to meaningfully reduce our research and corporate expenses; our and our strategic commercial partners' ability to obtain FDA and foreign regulatory approval of our other product candidates; our ability to identify and contract with regulatory-approved manufacturers for clinical and commercial supplies of our active pharmaceutical ingredients and product candidates; the impact of the recently announced reduction in force and the changes in our senior management and our ability to retain and hire necessary employees and to staff our operations appropriately; our anticipated capital expenditures and our estimates regarding our capital requirements, including the costs of addressing the complete response letter; our dependence on the success of solithromycin and fusidic acid; results of our and our strategic commercial partners' pre-clinical studies and clinical trials are not predictive of results from subsequent clinical trials for any possible therapy; risks related to the costs, sources of funding, timing, regulatory review and results of our studies, clinical trials and regulatory applications, including activities to address the complete response letter, and those of our strategic partners; our need to obtain additional funding and our ability to obtain future funding on acceptable terms; our ability to commercialize and launch whether on our own or with a strategic partner any product candidate that receives regulatory approval; the unpredictability of the size of the markets for, and market acceptance of, any of our products, including solithromycin and fusidic acid; our ability to produce and sell any approved products and the price we are able to realize for those products; the possible impairment of, or inability to obtain, intellectual property rights and the costs of obtaining such rights from third parties; our ability to compete in our industry; innovation by our competitors; and our ability to stay abreast of and comply with new or modified laws and regulations that currently apply or become applicable to our business. Please refer to the documents that we file from time to time with the Securities and Exchange Commission.

Portfolio Addresses Multiple Disease Areas

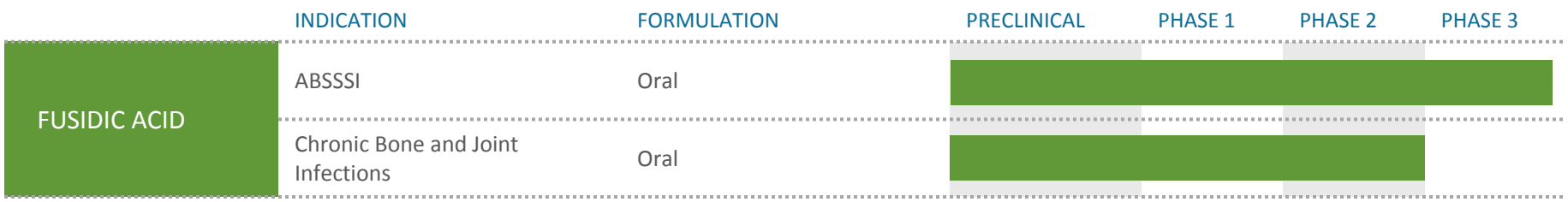
PRODUCT CANDIDATE	INDICATION	FORMULATION	PRECLINICAL	PHASE 1	PHASE 2	PHASE 3	NDA
SOLITHROMYCIN	Community Acquired Bacterial Pneumonia (CABP)	Oral [1]					
		IV-to-Oral [1]					
		Pediatric: Capsule/Suspension/IV					
	Urethritis/Gonorrhea	Oral					
	Conjunctivitis/Blepharitis/ Dry Eye	Ophthalmic					
FUSIDIC ACID	ABSSSI	Oral					
	Chronic Bone and Joint Infections	Oral					
NON-ANTIBIOTIC MACROLIDE	Diabetic Gastroparesis and GERD						



1. Complete Response Letter received December 2016

Fusidic acid for ABSSSI and BJI

An ORAL antibiotic for infections, including MRSA, being developed for ABSSSI and being studied for CHRONIC use in bone and joint infections in the U.S.



Positive Data from Phase 3 Study of Fusidic Acid in ABSSSI

- 716 adult patients, randomized 1:1 (double blind) to oral fusidic acid or linezolid (Zyvox)
  - Fusidic Acid: 1500 mg loading dose x2 + 600mg every 12 hrs for 10 days total
  - Linezolid: 600 mg every 12 hrs for 10 days total
  - 62 sites in the United States

- Patients stratified by type of infection (cellulitis, wound infection, major cutaneous abscess), by age and by prior use of an antibiotic within 36 hours prior to randomization.
  - Primary objective: Show non-inferiority vs Zyvox for early clinical response (ECR)

- 67.5% of study subjects had an infection associated with IV drug abuse

- Most common pathogens: *Staphylococcus aureus*, *Streptococcus anginosus* group species, *Streptococcus pyogenes* and *Clostridium* species

Outstanding Data from Phase 3 Study of Fusidic Acid in ABSSSI

	Fusidic Acid	Linezolid	Treatment Difference (95% CI)
ITT Population			
ECR (Primary Endpoint)	87.2 % (313/359)	86.6 % (309/357)	+0.6 (-4.6, +5.9)
Clinical Success at EOT	91.9 % (330/359)	89.6 % (320/357)	+2.3 (-2.2, +6.8)
Clinical Success at PTE	89.1 % (320/359)	88.5 % (316/357)	+0.6 (-4.9, +5.0)
CE Populations			
Clinical Success at EOT (CE-EOT)	97.1 % (303/312)	97.3 % (288/296)	-0.2 (-3.1, +2.8)
Clinical Success at PTE (CE-PTE)	95.7 % (292/305)	96.9 % (283/292)	-1.2 (-4.5, +2.2)

- Fusidic acid well tolerated in study
  - Treatment-emergent adverse events (TEAEs) comparable between treatment groups (37.9 percent fusidic acid, 36.1 percent linezolid)

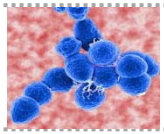
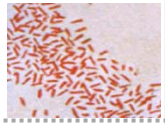
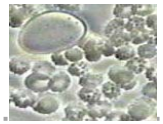
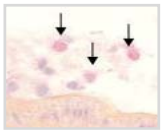
- 100% (99/99) success among fusidic acid recipients in each ME population with methicillin-resistant *S. aureus* (MRSA) at both the EOT and PTE visits

Progressing Fusidic Acid to Potential Approval

- QIDP granted for ABSSSI – exclusivity and priority review
- Data from refractory Phase 2/3 BJI study anticipated by year-end 2017
  - Enrollment completed (30/30) in late April
  - Primary objective: clinical success at 6 months in intent-to-treat (ITT) population
- Active FDA dialogue regarding path forward
  - Expectation: 2nd Phase 3 study required for potential approval in ABSSSI

The Need for Solithromycin: Spectrum of in-vitro Activity Addresses CABP Pathogens

Overcomes macrolide resistance that limits existing macrolides

GRAM		ORGANISMS	SOLITHROMYCIN	AZITHROMYCIN	CEFTRIAXONE	LEVOFLOXACIN or MOXIFLOXACIN
Positive		*Streptococcus pneumoniae*	✓	✗	✓	✓
Negative		*Haemophilus influenzae*	✓	✓	✓	✓
Positive		*Staphylococcus aureus*	✓	✗	✓	✓
Atypical		*Legionella pneumophila*	✓	✓	✗	✓
Atypical		*Mycoplasma pneumoniae*	✓	✓/✗	✗	✓
Atypical		*Chlamydophila pneumoniae*	✓	✓	✗	✓

Azithromycin Monotherapy not used to Treat Moderate to Severe Pneumonia – Potency, Spectrum and Resistance Allow Use Only in Simpler Infections or Add-On To Ceftriaxone

Data on file. Cempra Pharmaceuticals, Inc.

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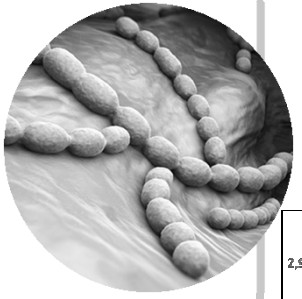
Community Acquired Bacterial Pneumonia: Prevalent, Deadly and Growing

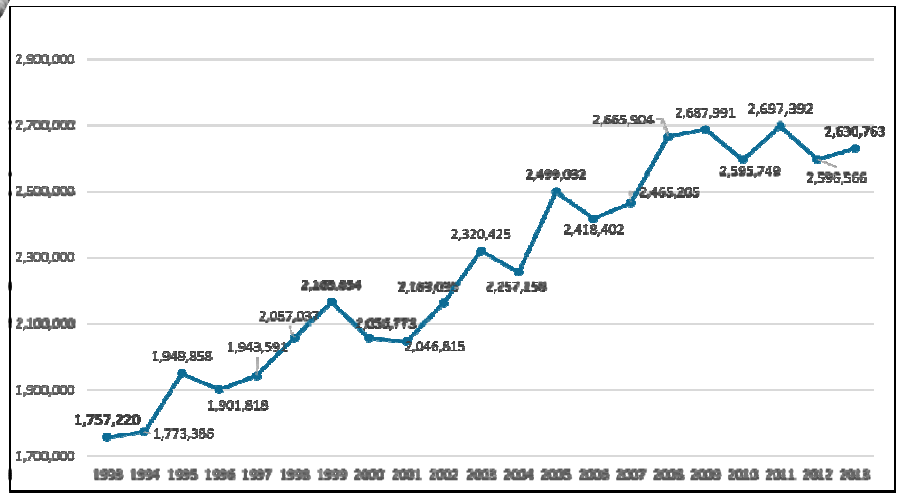
Prevalent and Deadly



- 5-10M Cases Annually
  - 1.1M Patients Hospitalized
- #1 Cause of Death from an Infection [1]
  - More Deaths from Pneumococcal Infections in US than Breast or Prostate Cancer [2]
- Affects Young Children and the Old Disproportionately

Growing

HOSPITAL DISCHARGES FOR PNEUMONIA [3]



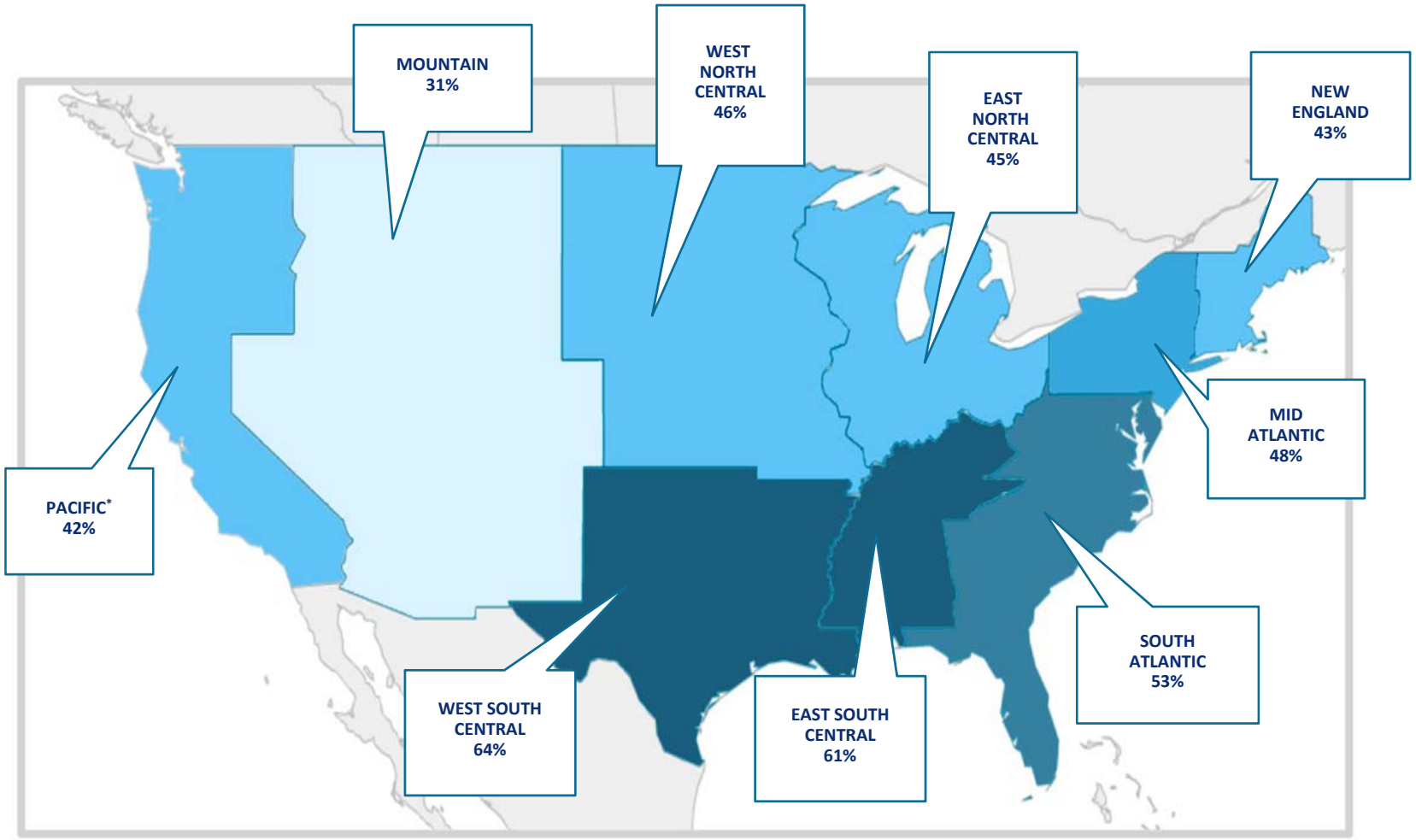
Appropriate Empiric Therapy Critical for Positive Outcomes

Multiple Pathogens (Pneumococcus Most Frequent)

1 Freeman, MK. CABP: A Primer for Pharmacists: US Pharmacist July 1, 2013
2 Xu, et al. Deaths: Final Data for 2007. Natl Vital Stat Rep. 2010;58:1-51.

3 Source: 2013 HCUP, ARHQ.gov

Need for Solithromycin:
Macrolide Resistance to *S. Pneumoniae* 49% Across US



[a]Includes Alaska and Hawaii. Data on file. Cempra Pharmaceuticals, Inc.

IDSA / ATS CABP Guidelines

Healthy Outpatient	Outpatient at Risk of DRSP*	Inpatient Non-ICU	Inpatient ICU
Macrolide Or Doxycycline	Respiratory Fluoroquinolone Or Beta-lactam plus Macrolide	Beta-lactam‡ plus Macrolide Or Respiratory Fluoroquinolone Or Tigecycline	Beta-lactam plus Azithromycin Or Beta-lactam plus Fluoroquinolone

* **D**rug **R**esistant ***S. p****neumoniae* - Recent antimicrobials; comorbidities; Includes healthy patients in regions with high rates of macrolide resistance

‡ Ceftriaxone, cefotaxime, amp/sulbactam, ertapenem, ceftaroline (from CMS list)

Strong Phase 3 Clinical Program

- Both studies achieved their primary efficacy endpoint:
  - Non-inferior to moxifloxacin in CABP (5 to 7 day course of therapy)

- Observed ALT/AST elevations, consistent with other approved macrolides

- SOLITAIRE-ORAL
  - 860 adult CABP patients randomized (1:1) to receive oral solithromycin or moxifloxacin
- SOLITAIRE IV
  - 863 adult CABP patients randomized (1:1) to receive IV solithromycin or moxifloxacin with option for transition to oral

- Studies designed in accordance w/FDA Guidance for Industry for CABP trials
  - Study design and scope discussed with FDA at end of Phase 2 meeting

Solithromycin FDA Regulatory Path

- NDAs (Oral and IV) submitted: April 27 (oral) & 28 (IV), 2016
  - Proposed indication: 5-7 day one-time course of therapy for adults with CABP

- Advisory committee meeting: November 4, 2016
  - Is there substantial evidence of the efficacy of solithromycin for CABP?
    - YES (13-0)
  - Has the risk of hepatotoxicity been adequately characterized?
    - NO (12-1)
  - Does the efficacy of solithromycin for the treatment of CABP outweigh the risks, including hepatotoxicity?
    - YES (7-6)

- PDUFA dates: December 27 (oral) & 28 (IV), 2016
  - Complete Response Letter received

CRL Requests Additional Clinical Safety and CMC Information

- No further information on solithromycin efficacy for CABP requested

- FDA determined risk of hepatotoxicity is not adequately characterized
  - The FDA noted size of the safety database is limited to 920 patients

- FDA recommending a comparative study of approximately 9,000 patients to evaluate the safety of solithromycin in patients with CABP

- CRL states even in the absence of a case of Hy's Law or another form of serious DILI in future studies, labeling will need to include adequate information about potential for hepatotoxicity, limiting use to patients who have limited treatment options and limitations regarding duration of therapy

- Satisfactory resolution of CMC deficiencies at Wockhardt and Hospira required prior to approval

Next Steps with FDA

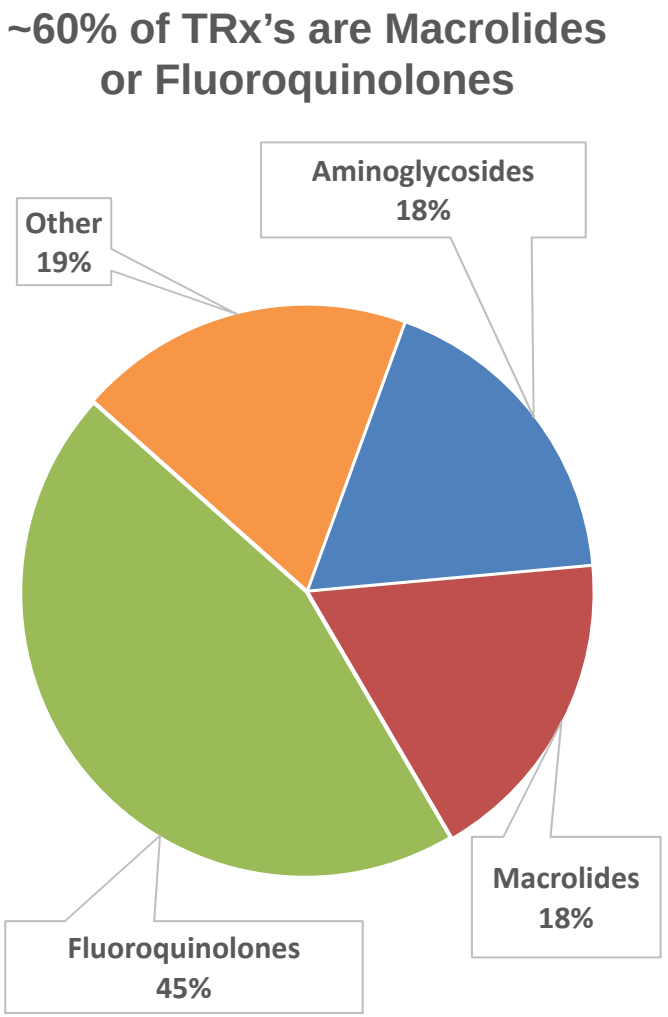
- February 2017 meeting with FDA to discuss CRL items and paths to resolution
  - Details on required clinical safety study
  - Updated FDA on CEMP progress with Uquifa
    - Uquifa registration lots/stability (3 months) underway
    - Expect clinical data, not manufacturing, will be rate limiting to CRL response timing
  - FDA encouraged CEMPRA to submit protocol
  - Cempra has submitted a protocol proposing:
    - <9,000 patients at time of CRL response
    - Delivering data in cohorts as study progresses
    - Data in CRL response could support approval
    - Company would continue to accumulate safety data post-approval
  - Active ongoing dialogue w/FDA to determine if agreement can be reached on protocol
- If company and FDA agree on a protocol, Cempra would seek non-dilutive financing
  - Have initiated discussions with BARDA
- MAA withdrawn to conserve resources and align with FDA strategy to provide data

Significant Pediatric CABP Opportunity for Solithromycin

- BARDA funding recently initiated Phase 2/3 pediatric trial
- Current treatment options for children even more limited
- Enrolling 400 children age two months to 17 years
- Patients receive IV, oral suspension or oral capsule formulations of solithromycin
  - Active comparator: standard of care therapy
  - 3:1 randomization (~300 patients to receive solithromycin)

Accelerating Evaluation of Ophthalmic Opportunity: Ophthalmic Antibiotic Market Generated ~19MM TRx in 2016

- 50% of ophthalmic prescriptions are for infections of the eye
- Pathogens responsible for bacterial conjunctivitis are similar to those that cause pneumonia
- Ophthalmic formulation would be expected to have little/no liver exposure
- Ophthalmic clinical trials typically enroll/complete rapidly



Source: IMS NPA and NDTI, 2016

Companywide Cost & Personnel Reductions Extend Cash Runway

- Workforce reduced approximately 67 percent from 136 to 45 in Q1
- Significant reductions in commercial & non-essential external spending
- Actions to reduce 2H 2017 expenses by >70% compared to 2H 2016 expenses
  - Does not assume solithromycin launch expenses or any additional clinical trials with any of our product candidates
- Cash and equivalents at 3/31/17: $202.8 million
- Goal: Conserve financial resources as we evaluate best path forward with existing pipeline and potential business development opportunities

Evaluating External Opportunities to Drive Shareholder Value

- Process underway to review strategic business options
- Wide-ranging review of business opportunities
  - Not limited to anti-infective space
  - Open to variety of options
- Goal: Fully-informed assessment of external and internal opportunities to determine best use of significant cash resources and clinical programs to deliver value to patients and shareholders
- Status: Robust process that is advancing into final phase

Cempra: 2017 Areas of Focus

- Preserve cash
- Identify external business opportunities to consider
- Identify best path forward with fusidic acid
  - BJI data by YE 2017
- Progress manufacturing work necessary for CRL response
- Develop/agree to protocol to enable data for CRL response and potential approval using non-dilutive funding to support
- Progress ophthalmic solithromycin to IND-ready

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Developing Well-Differentiated Antibiotics