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Apadaz™ Update – Conference Call Participants

- **Travis Mickle, Ph.D.** – President & Chief Executive Officer
- **Rusty Johnson, M.B.A.** – Chief Business Officer
- **Dan Cohen, M.A.L.S.** – EVP, Government & Public Relations
Apadaz™ Approval

✔ Announced FDA Approval of Apadaz (benzhydrocodone and acetaminophen) for the Short-Term Management of Acute Pain
  • First prodrug of hydrocodone/acetaminophen to be approved by FDA
  • Immediate release (IR) combination of KemPharm’s prodrug of hydrocodone, benzhydrocodone, and acetaminophen (APAP)
  • Completed DEA product scheduling and quota allocation for Apadaz

✔ Apadaz Approval is Significant Milestone for KemPharm
  • Opportunity to introduce differentiated product for the short-term management of acute pain
  • Demonstrates value potential of KemPharm’s LAT™ platform and technological approach to drug development
  • Validation of KemPharm’s business strategy and corporate vision
Apadaz™ Product Overview

• IR opioid fixed-dose combination product comprised of 6.67 mg benzhydrocodone HCl (a prodrug of hydrocodone equivalent to 7.5 mg hydrocodone bitartrate) and 325 mg APAP

• Prodrug consists of hydrocodone plus benzoic acid

• Developed using a 505(b)(2) regulatory pathway
  o Bioequivalent, with no food effect

• Absent of “abuse-deterrent” claims, differentiated properties based on Apadaz development program include:
  o Reduced early systemic hydrocodone exposure and delayed hydrocodone $T_{\text{max}}$ for IN Apadaz vs. IN Norco
  o Lowered early Drug Liking for IN Apadaz vs. IN Norco in first 2 hours post dose
  o Conversion (hydrolysis) of benzhydrocodone to hydrocodone in vitro is a difficult process

• Composition-based patent expires in 2031
### Apadaz Label – Key Areas of Differentiation

#### Section 2 (Dosage and Administration)

**APADAZ:**
- Initiate treatment with APADAZ at 1 to 2 tablets every 4 to 6 hours as needed for pain. Dosage should not exceed 12 tablets in a 24-hour period.

**Norco:**
- The usual adult dosage is 1 tablet every 4 to 6 hours as needed for pain. The total daily dosage should not exceed 6 tablets.

#### Section 12.3 (PK)

**Absorption:**
- The effect of a high-fat, high-calorie meal on pharmacokinetics is similar between APADAZ and immediate-release tablet of 7.5 mg hydrocodone/325 mg acetaminophen. APADAZ can be administered without regard to food.

**Metabolism:**
- Benzhydrocodone is a prodrug of hydrocodone and is converted to active hydrocodone by enzymes in the intestinal tract.
Section 9.2

**Intranasal Clinical Abuse Potential**
- Over the first 2 hours post-dosing (AUC0-0.5, AUC0-1, and AUC0-2), the cumulative hydrocodone exposure was lower following intranasal APADAZ compared to intranasal hydrocodone/acetaminophen.
- Additional secondary analyses of Drug Liking based on area under the effect curve analyses (AUE) for the first half hour, hour, and 2 hours post-dosing, demonstrated numerically small differences between intranasal APADAZ and intranasal hydrocodone/acetaminophen.

**Human Abuse Liability Trials Results**
- The results of the oral and intranasal human abuse potential studies did not support a finding that APADAZ can be expected to deter abuse by the oral or nasal routes of administration.

**In Vitro Testing**
- The efficiency of extracting benzhydrocodone from APADAZ was similar compared to the efficiency of extracting hydrocodone from the non-abuse-deterrent hydrocodone/acetaminophen control. Further conversion (hydrolysis) of benzhydrocodone to hydrocodone in vitro is a difficult process.
Apadaz Label -- Key Areas of Differentiation

100 Count Bottle

Blister Pac
### Apadaz Commercialization Strategy

*KemPharm is pursuing two potential strategies for commercializing Apadaz, neither strategy requires KemPharm to establish its own sales force.*

<table>
<thead>
<tr>
<th>Non-traditional PBM Partnerships</th>
<th>Pharma Partnership</th>
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<tbody>
<tr>
<td>• Collaborative partnerships with leading US PBM`s who would agree to Tier 1 or equivalent status for Apadaz (including most favorable co-pay) in return for price parity with available generic products</td>
<td>• Partnership with a US-based or global generic pharmaceutical manufacturer and distributor</td>
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<td>• PBM`s would work to educate prescribers/plan sponsors and actively manage Apadaz prescriptions</td>
<td>• Takes advantage of generic pharma’s economies of scale to optimize Apadaz COGS</td>
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<td>• Generic pharma partner may also utilize non-traditional PBM partnership strategy</td>
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# KemPharm Expected Milestones

<table>
<thead>
<tr>
<th>Product</th>
<th>Event</th>
<th>Date</th>
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<tbody>
<tr>
<td>KP484</td>
<td>IND Filing</td>
<td>2017</td>
</tr>
<tr>
<td>KP415</td>
<td>Initiate Pivotal Efficacy Study</td>
<td>2017</td>
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<tr>
<td>Apadaz</td>
<td>FDA Approval</td>
<td>02/23/18</td>
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<tr>
<td>KP415 / KP484</td>
<td>IV Human Abuse Liability (HAL) Data</td>
<td>2018</td>
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<tr>
<td>KP415</td>
<td>Pivotal Efficacy Study Results</td>
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<tr>
<td>KP484</td>
<td>Initiate Pivotal Efficacy Study</td>
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<tr>
<td>KP415 / KP484</td>
<td>Oral and IN HAL Data</td>
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<td>KP415</td>
<td>NDA Submission</td>
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Apadaz™ FDA Approval

February 23, 2018