Forward Looking Statements

This presentation contains forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995 that involve substantial risks and uncertainties. In some cases, you can identify forward-looking statements by the following words: “may,” “will,” “could,” “would,” “should,” “expect,” “intend,” “plan,” “anticipate,” “contemplate,” “believe,” “estimate,” “predict,” “project,” “seek,” “potential,” “continue,” “ongoing” or the negative of these terms or other comparable terminology, although not all forward-looking statements contain these words. These statements relate to future events or our future financial performance or condition and involve known and unknown risks, uncertainties and other factors that could cause our actual results, levels of activity, performance or achievement to differ materially from those expressed or implied by these forward-looking statements. These risks, uncertainties and other factors are described more fully in our Annual Report on Form 10-K and subsequent quarterly reports, all of which are filed with the SEC, particularly in the sections titled “Risk Factors” and “Management’s Discussion and Analysis of Financial Condition and Results of Operations.” In light of the significant uncertainties in our forward-looking statements, you should not place undue reliance on these statements or regard these statements as a representation or warranty by us or any other person that we will achieve our objectives and plans in any specified timeframe, or at all. The forward-looking statements contained in this presentation represent our estimates and assumptions only as of the date of this presentation and, except as required by law, we undertake no obligation to update or revise publicly any forward looking statements, whether as a result of new information, future events or otherwise after the date of this presentation.

This presentation also contains estimates, projections and other information concerning our industry, our business, and the market for our drug candidate, as well as data regarding market research, estimates and forecasts prepared by our management. Information that is based on estimates, forecasts, projections, market research or similar methodologies is inherently subject to uncertainties and actual events or circumstances may differ materially from events and circumstances reflected in this information.
KYTHERA Acquires Worldwide Rights to Clinical Compound and Key Intellectual Property for Potential Novel Treatment of Hair Loss

Westlake Village, Calif., February 10, 2015 – KYTHERA Biopharmaceuticals, Inc. (NASDAQ: KYTH) today announced that it has entered into separate license agreements with Actelion Pharmaceuticals Ltd. and the University of Pennsylvania for a novel approach for the treatment of hair loss, which together could enable KYTHERA to bring a new treatment to the very large and still highly unsatisfied hair loss market.

“These two licenses build on KYTHERA’s focus on developing and commercializing high-value, self-pay aesthetic products that have the promise to yield high patient satisfaction and enhanced self image,” said Keith Leonard, KYTHERA’s president and CEO. “Based on several years of research and clinical work already accomplished, we believe we have the possibility of reaching initial proof-of-concept data in a very capital efficient manner.”
Key Elements to a Successful Program are in Place

- Scientific Insight
- Company Capabilities
- Market Potential
- Right Molecule
- Critical IP
George Cotsarelis MD, head of dermatology at the University of Pennsylvania

- Discovered that prostaglandin D$_2$ (PGD$_2$) played major role in hair loss$^1$
  - Defined PGD$_2$ as an inhibitor of hair growth in male pattern hair loss
  - Suggested inhibition of the PGD$_2$ receptor as a potential target for treatment

PGD$_2$ found to inhibit hair growth; blocking PGD$_2$ receptor may promote hair growth or retard hair loss

PGD$_2$ Production in Bald Scalp as Measured by HPLC Mass Spectrometry

High PGD$_2$

Low PGD$_2$

Preclinical models showed that PGD$_2$ receptor antagonists prevented negative effect of PGD$_2$ on hair growth\(^1\)

I. Abolished hair growth inhibiting activity of PGD$_2$ in hair follicles extracted from both male and female human donors (\textit{in vitro})

II. In addition, PGD$_2$ suppression may extend anagen phase in hair

- \textit{In vivo} shortened telogen and extend anagen phase in animals
  - Extension of anagen believed to be a way to combat hair loss

Research Suggests Blocking PGD$_2$ Extends Anagen (Growing) Phase
PGD₂ inhibits growth of in vitro human hair follicles\(^1\)

- Growth of follicles from most donors negatively affected by PGD₂

Setipiprant and other PGD₂R antagonists able to reverse this effect in vitro\(^2\)

- Results demonstrated with five distinct PGD₂R antagonists
- Effective in reversing inhibitory effects in follicles from most but not all donors

Effect is dose dependent but with plateau\(^2\)

Population Analysis from 1,041 follicles from 13 donors

<table>
<thead>
<tr>
<th>Test Article</th>
<th>Comparator</th>
<th>P*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicle</td>
<td>PGD₂</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>PGD₂ + Setipiprant 10 nM</td>
<td>PGD₂</td>
<td>0.0547</td>
</tr>
<tr>
<td>PGD₂ + Setipiprant 100 nM</td>
<td>PGD₂</td>
<td>0.0047</td>
</tr>
<tr>
<td>PGD₂ + Setipiprant 1000 nM</td>
<td>PGD₂</td>
<td>0.0014</td>
</tr>
</tbody>
</table>

* Differences of Least Square Means

PGD₂ Appears to Arrest Hair Follicle Growth in Both Men and Women
Working Hypothesis of PGD$_2$’s Role in Hair Loss

Testosterone
5α-reductase
Dihydrotestosterone (DHT)

Setipirant

Reduced Hair Growth and Eventual Hair Loss

Androgen Receptor Level and Activity
PGD2 synthase activity
PGD$_2$ Production
PGD$_2$ Receptor Activation

Hormone
Enzyme
Receptor
Prostaglandin
Fits Corporate Intent and Capabilities

- **Fits KYTHERA strategy to build leading aesthetics company**
  - Aligns with our focus on developing drugs that enable customers to achieve a healthy and positive self-image
  - Already had active research programs in hair
  - Novel approach

- **Fits KYTHERA’s “lean” research model**
  - KYTHERA acted quickly to secure exclusive option
  - Committed to long-term research collaboration with Dr. Cotsarelis and the University of Pennsylvania
  - First time a hypothesis-driven approach taken to discovery of a hair growth treatment

- **Fits well with existing experience**
  - Demonstrated clinical development, regulatory and manufacturing expertise of similar-stage molecule (ATX-101)

- **Fits well into existing clinical and regulatory capabilities**
  - In-house experience in developing drugs for the prevention of hair loss

KYTHERA combines the scientific and clinical rigor of biotechnology with the attractive market potential of aesthetics
Setipiprant

- Is a selective oral antagonist to the PGD$_2$ receptor
- Has been tested in multiple clinical trials as a potential allergic inflammation treatment
- Has undergone 8 clinical trials, including:
  - a Phase III study in seasonal allergic rhinitis patients
  - a Phase IIB proof of concept study in asthma patients
- Has a safety database of >1,000 subjects
  - Treatment in all studies was well tolerated across all treatment groups

KYTHERA sees potential product advantages including:

- Oral dosing (improved compliance)
- No anti-androgenic effects expected (esp. sexual dysfunction)
- New and potentially complementary therapeutic approach
Setipiprant is a Well-characterized Molecule with Large Safety Database

<table>
<thead>
<tr>
<th>Pre-Clinical Studies</th>
<th>Clinical Studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>In vitro hERG, phototoxicity studies</td>
<td>Phase I SAD/MAD in healthy volunteers</td>
</tr>
<tr>
<td>Genotoxicology in vitro and in vivo</td>
<td>Phase I ADME in healthy volunteers</td>
</tr>
<tr>
<td>Safety pharmacology in 3 species</td>
<td>Phase I DDI with simvastatin in healthy volunteers</td>
</tr>
<tr>
<td>General toxicology in 3 species including 26-week rodent and 52-week dog</td>
<td>Phase I relative BE study in healthy volunteers</td>
</tr>
<tr>
<td>Reproductive toxicology in 2 species</td>
<td>Phase II proof-of-mechanism study in asthma</td>
</tr>
<tr>
<td>Carcinogenicity studies in 2 species (final analysis pending)</td>
<td>Phase IIB proof-of-concept in seasonal allergic rhinitis</td>
</tr>
<tr>
<td></td>
<td>Phase IIB proof-of-concept study in asthma</td>
</tr>
<tr>
<td></td>
<td>Phase III study in seasonal allergic rhinitis</td>
</tr>
</tbody>
</table>
## Adverse Events in KYTH-105 (Setipiprant) Phase III Seasonal Allergic Rhinitis Clinical Trial

### Treatment Emergent Adverse Events (including unrelated) Reported in More than 1 Subject in Setipiprant Group

<table>
<thead>
<tr>
<th></th>
<th>Setipiprant 1000 mg BID n = 211</th>
<th>Placebo n = 208</th>
<th>Cetirizine 10 mg QD n = 210</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total patients with at least one AE (%)</td>
<td>24 (11.4%)</td>
<td>34 (16.3%)</td>
<td>23 (11.0%)</td>
</tr>
<tr>
<td>Total number of AEs</td>
<td>40</td>
<td>43</td>
<td>30</td>
</tr>
<tr>
<td>AEs reported in more than 1 patient (&gt; 0.5%) in the setipiprant group</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dry mouth (%)</td>
<td>4 (1.9%)</td>
<td>3 (1.4%)</td>
<td>2 (1.0%)</td>
</tr>
<tr>
<td>Nausea (%)</td>
<td>4 (1.9%)</td>
<td>0</td>
<td>2 (1.0%)</td>
</tr>
<tr>
<td>Somnolence (%)</td>
<td>2 (0.9%)</td>
<td>3 (1.4%)</td>
<td>4 (1.9%)</td>
</tr>
<tr>
<td>Hepatic enzyme elevation</td>
<td>2 (0.9%)</td>
<td>2 (1.0%)</td>
<td>0</td>
</tr>
<tr>
<td>Anxiety</td>
<td>2 (0.9%)</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

- Majority of AEs were considered mild or moderate
- AEs considered by the investigator to be treatment-related were reported in 5.7% of setipiprant, 10.6% of placebo, and 4.3% of cetirizine subjects
- 1 subject on setipiprant* (0.5%), 5 patients on placebo (2.4%), and 2 patients on cetirizine (1.0%) discontinued the study due to AEs

* Subject on setipiprant who discontinued is patient with SAE of cholelithiasis
Serious Adverse Events in KYTH-105 (Setipiprant) Phase III Seasonal Allergic Rhinitis Clinical Trial

### Serious Adverse Events\(^1\)

<table>
<thead>
<tr>
<th></th>
<th>Setipiprant 1000 mg BID n = 211</th>
<th>Placebo n = 208</th>
<th>Cetirizine 10 mg QD n = 210</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total patients with at least one SAE (%)</td>
<td>1 (0.5%)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total number of SAEs</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>SAEs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cholelithiasis</td>
<td>1 (0.5%)</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

- No deaths in any study group
We Have Secured Critical and Broad IP

**University of Pennsylvania IP**

- Exclusive worldwide licenses
- Method of Use patent applications for the inhibition of PGD$_2$ for hair loss, filed in major markets
- Covers methods of use for modulators of the prostaglandin D$_2$ receptors for hair growth

**Actelion IP**

- Exclusive worldwide licenses
- Covers setipiprant and analogues
- 48 patents and patent applications; 45 of which are granted for molecules that inhibit of PGD$_2$
Hair Loss Treatment is a Large and Growing Market

Despite shortcomings of existing treatments, hair loss treatment is a $2B and growing market

Global alopecia therapeutics market forecast to grow at CAGR of 4.8% from 2010 to 2017\(^1\)

Hair loss affects a majority of men >50 years of age

80% of Caucasian men experience some degree of androgenic alopecia (AGA) before age 70\(^2\)

\(^1\) GMRData: The Global Dermatology Market 2013-2023  
Many Men and Women Suffer from Hair Loss, Which Can Have Significant Detrimental Effects on Self-Image

**Number Of:**

U.S. Men Experiencing Hair Loss **35 Million**

U.S. Women Experiencing Hair Loss **21 Million**

Hair loss sufferers, world-wide, seeking professional treatment **>970 K**

**Percent of Hair Sufferers (n = 571) Who Said Their Hair Loss:**

- Makes them feel less attractive **26%**
- Makes them self-conscious **25%**
- Makes them look older **18%**
- Makes them less confident **15%**

73% would trade a treasured personal possession for more hair

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2 2013 ISHRS Practice Census Results
3 2010 ISHRS Hair Transplant Challenge Survey
Program Next Steps

2015 / 16

- Open an IND for setipiprant
- Initiate a Proof-of-Concept study for setipiprant
Key Elements to a Successful Program are in Place

- Scientific Insight
- Company Capabilities
- Right Molecule
- Critical IP
- Market Potential
March 12, 2015