



## Calithera Biosciences Selects Immuno-Oncology Clinical Candidate CB-1158, an Oral Arginase Inhibitor for the Treatment of Cancer

June 23, 2015

*Similar mechanism of action to IDO inhibitors*

*Potential to combine with anti-CTLA-4, anti-PD-1 and other immuno-oncology therapies*

SOUTH SAN FRANCISCO, Calif., June 23, 2015 (GLOBE NEWSWIRE) -- Calithera Biosciences, Inc. (Nasdaq:CALA), announced today at the JMP Securities Life Sciences Conference in New York City, the selection of CB-1158 as the clinical candidate for their immuno-oncology program targeting inhibition of arginase, a critical immunosuppressive enzyme secreted by myeloid-derived suppressor cells (MDSCs) in tumors. Calithera anticipates submitting an Investigational New Drug (IND) application to the FDA for its first in class oral arginase inhibitor for the treatment of cancer near the end of the first quarter of 2016. Arginase exerts its immunosuppressive effect by depleting the amino acid arginine in the tumor microenvironment and preventing the immune system's cytotoxic T-cells and natural killer (NK) cells from proliferating and killing the tumor. Inhibition of arginase activity reverses this immunosuppressive block and restores T-cell function.

"We believe that drugs targeting metabolism pathways have the potential to be transformational in the treatment of cancer. At Calithera, we are dedicated to researching and developing first-in-class metabolism- targeted therapies that could significantly advance the field of immuno-oncology," said Susan M. Molineaux, PhD, President and CEO, Calithera Biosciences. "We are particularly excited about the potential of our small molecule arginase inhibitors to treat cancer by blocking the immunosuppression of MDSCs and activating the immune system to kill tumors."

Calithera has discovered novel, orally active arginase inhibitors that have shown inhibition of tumor growth in immunocompetent syngeneic mice. This inhibition of tumor growth is accompanied by a rapid increase in the local concentration of arginine, resulting in a rise in the number of CD3+ T-cells within the tumor. This is similar to what happens when indoleamine 2,3-dioxygenase (IDO) inhibitors block the degradation of tryptophan by IDO, leading to restoration of tryptophan levels in the tumor and activation of tumor-associated T-cells. CB-1158 has the potential for anti-tumor activity in renal cell cancer, breast cancer, non-small cell lung cancer, acute myeloid leukemia, and other tumor types where arginase-secreting MDSCs are known to play an immunosuppressive role. CB-1158 may also have the ability to combine with other immuno-oncology therapies that target T-cell activation, such as CTLA-4 and PD-1 antibodies.

In December 2014, Calithera entered into an exclusive license agreement with Mars Corporation's Symbioscience Division, under which the company has been granted the exclusive, worldwide license rights to develop and commercialize Symbioscience's portfolio of arginase inhibitors for use in human healthcare.

### **About Tumor Immunology and Arginase Inhibitors**

The field of tumor immunology is focused on developing agents that activate the body's own immune system to attack and kill tumors. Calithera's preclinical program in tumor immunology is focused on developing selective inhibitors of the enzyme arginase, produced by MDSCs within the tumor microenvironment. MDSCs deplete arginine, a naturally occurring amino acid that is critical for the activation, growth and survival of the body's cancer-fighting cytotoxic T cells and NK cells. High plasma arginase activity has been observed in patients with late stage cancers, including non-small cell lung cancer, renal cell carcinoma, glioblastoma, esophageal cancer and acute myeloid leukemia. By inhibiting arginase, it may be possible to restore the tumor killing activity of cytotoxic T cells by preventing the depletion of arginine.

### **About Calithera Biosciences**

Calithera Biosciences is a clinical-stage company focused on discovering and developing novel small molecule drugs directed against tumor metabolism and tumor immunology. Calithera's lead clinical candidate, CB-839, is a first-in-class inhibitor of glutaminase, a critical enzyme in tumor metabolism, and is currently being tested in patients with solid and hematological cancers. Calithera Biosciences is headquartered in South San Francisco. For more information about Calithera Biosciences, please visit [www.calithera.com](http://www.calithera.com).

### **Forward-Looking Statements**

This news release contains forward-looking statements by Calithera that involve risks and uncertainties. These statements include those related to the potential for CB-1158 to inhibit arginase, induce anti-cancer activity and combine with other immuno-oncology therapies that target T-cell activation, the timing of Calithera's submission of an IND application to the FDA for its oral arginase inhibitor and the potential for drugs targeting metabolism pathways of immune cells to be transformational in the treatment of cancer. Actual results may differ from Calithera's expectations and important factors that could cause actual results to differ materially. Calithera's arginase program or other potential product candidates that Calithera develops may not progress through clinical development or receive required regulatory approvals within expected timelines or at all. In addition, clinical trials may not confirm any safety, potency or other product characteristics described or assumed in this press release. Such product candidates may not be beneficial to patients or successfully commercialized. The failure to meet expectations with respect to any of the foregoing matters may have a negative effect on Calithera's stock price. Additional information concerning these and other risk factors affecting Calithera's business can be found in Calithera's Quarterly Report on Form 10-Q for the quarter ended March 31, 2015 filed with the Securities and Exchange Commission on May 11, 2015, and other periodic filings with the Securities and Exchange Commission at [www.sec.gov](http://www.sec.gov). These forward-looking statements are not guarantees of future performance and speak only as of the date hereof, and, except as required by law, Calithera disclaims any obligation to update these forward-looking statements to reflect future events or circumstances.

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