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# Amarantus Announces Issuance of Chinese Patent Covering the Use of MANF and CDFN in Retinal Disorders for Subsidiary MANF Therapeutics

*Patent covers use of MANF in Glaucoma, Wolfram Syndrome and Retinitis Pigmentosa*

New York, NY, Nov. 21, 2019 (GLOBE NEWSWIRE) -- via NEWMEDIAWIRE -- Amaranthus Bioscience Holdings, Inc. (OTC Pink: AMBS) ("Amarantus," or AMBS), a US-based JLABS-alumnus biotechnology holding company developing proprietary orphan neurologic, regenerative medicine and ophthalmic therapies and diagnostics through its subsidiaries, today announced that subsidiary MANF Therapeutics has been issued a Chinese patent covering the use of mesencephalic astrocyte-derived neurotrophic factor (MANF) and/or cerebral dopamine neurotrophic factor (CDFN) for the treatment of retinal disorders. MANF Therapeutics is focused on the development of MANF as an intravitreal injection for the treatment of glaucoma, macular degeneration, retinitis pigmentosa and Wolfram Syndrome.

**The ophthalmic therapeutic market is expected to reach \$35B by 2025 according to Grand View Research, Inc.** Glaucoma affects approximately 4 million people in the United States, with a total drug market size of approximately \$3B. With its novel mechanism of action, MANF addresses key pathways in a variety of 'back of the eye' retinal conditions, which is an area with significant unmet medical need.

MANF has significant therapeutic potential across multiple **orphan ophthalmological conditions such as retinal artery occlusion (RAO) and retinitis pigmentosa**, where MANF has already received orphan drug designations from the FDA, Wolfram Syndrome, as well as in larger indications such as **glaucoma**, Parkinson's disease, diabetes and cardiovascular disease, including stroke and myocardial infarction. MANF Therapeutics is the front-runner and primary worldwide intellectual property (IP) holder for MANF-based therapies including protein therapy, gene therapy and cell therapy. The Company owns rights to composition of matter patents and patent applications for MANF and owns, or has licenses to, method of use patents and patent applications covering the use of MANF in ophthalmology, neurology and diabetes.

Amarantus has entered into a binding term sheet to license MANF to Emerald Organic Products. The transaction is expected to close in the fourth quarter of 2019.

**About MANF Therapeutics, Inc.**

MANF (mesencephalic-astrocyte-derived neurotrophic factor) is believed to have broad potential because it is a naturally-occurring protein produced by the body to reduce/prevent apoptosis (cell death) in response to injury or disease, via the unfolded protein response. By administering exogenously produced MANF to the body, Amaranthus is seeking to use a regenerative medicine approach to assist the body with higher quantities of MANF when needed. Amaranthus is the front-runner and primary holder of intellectual property around MANF and is initially focusing on the development of MANF-based protein therapeutics.

MANF's lead indication is Wolfram Syndrome, and additional indications including glaucoma, Parkinson's disease, diabetes and retinitis pigmentosa are envisioned. Further applications for MANF may include Alzheimer's disease, traumatic brain injury, myocardial infarction, antibiotic-induced ototoxicity and certain other orphan diseases.

In April 2017, Amaranthus incorporated the wholly-owned subsidiary MANF Therapeutics, Inc. to focus on progressing pre-clinical and clinical development of MANF.

### **About Amaranthus Bioscience Holdings, Inc.**

Amaranthus Bioscience Holdings (AMBS) is a JLABS alumnus biotechnology company developing treatments and diagnostics for diseases in the areas of neurology, regenerative medicine and orphan diseases through its subsidiaries. The Company's 80.01%-owned subsidiary **Breakthrough Diagnostics, Inc.**, currently a joint venture with Todos Medical, Ltd. has licensed intellectual property rights to the Alzheimer's blood diagnostic LymPro Test ® from Leipzig University that was originally developed by Dr. Thomas Arendt, as well as certain rights to multiple sclerosis diagnostic MSPrecise™ and Parkinson's diagnostic NuroPro. Amaranthus entered into a joint venture agreement with **Todos Medical, Ltd.** to advance diagnostic screening assets, and Todos has exercised its exclusive option to acquire Amaranthus' remaining ownership in Breakthrough in exchange for approximately 50% ownership of Todos. The transaction is expected close before the end of the first quarter of 2020. Amaranthus also owns approximately 30% of the common shares of **Avant Diagnostics, Inc.**, a healthcare data-generating technology company that specializes in biomarker assay services that target multiple areas of oncology. Avant provides precision oncology data through its TheraLink® assays to assist the biopharmaceutical industry and clinical oncologists in identifying likely responders, initially for breast cancer, to over 70 FDA-approved drug treatments.

AMBS 50%-owned subsidiary **Elto Pharma, Inc.** has development rights to eltoprazine, a Phase 2b-ready small molecule indicated for Parkinson's disease levodopa-induced dyskinesia, Alzheimer's aggression and adult attention deficit hyperactivity disorder, commonly known as ADHD. The AMBS acquired **Cutanogen Corporation** from Lonza Group in 2015. Cutanogen is preparing for pivotal studies with Engineered Skin Substitute (ESS) for the treatment of pediatric life-threatening severe burns. ESS is a regenerative medicine-based, autologous full-thickness skin graft technology originally developed by the Shriners' Hospital that can be used to treat severe burns, as well as several other catastrophic and cosmetic dermatological indications. AMBS' wholly-owned subsidiary, **MANF Therapeutics Inc.** owns key intellectual property rights and licenses from a number of prominent universities related to the development of the therapeutic protein known as mesencephalic astrocyte-derived neurotrophic factor ("MANF"). MANF Therapeutics is developing MANF-based products as treatments for ophthalmological disorders such as Wolfram Syndrome, retinitis pigmentosa and glaucoma, as well as

neurodegenerative diseases such as Parkinson's disease. MANF was discovered by the Company's Chief Scientific Officer John Commissiong, PhD. Dr. Commissiong discovered MANF from AMBS' proprietary discovery engine PhenoGuard, and believes several other neurotrophic factors remain to be discovered. Amaranthus has entered into a binding letter of intent to license the therapeutic assets from Elto Pharma, Cutanogen and MANF Therapeutics to Emerald Organic Products.

For further information please visit [www.Amarantus.com](http://www.Amarantus.com), or connect with the Amaranthus on Facebook, LinkedIn, and Twitter.

#### **Amarantus Investor and Media Contact:**

Gerald Commissiong

President & CEO

Office: 650-862-5391

Email: [gerald@amarantus.com](mailto:gerald@amarantus.com)

#### **Notice Regarding Forward-Looking Statements**

This letter contains forward-looking statements, about the Company's expectations, beliefs or intentions regarding, among other things, its product development efforts, business, financial condition, results of operations, strategies or prospects. Forward-looking statements can be identified by the use of forward-looking words such as "believe," "expect," "intend," "plan," "may," "should" or "anticipate" or their negatives or other variations of these words or other comparable words or by the fact that these statements do not relate strictly to historical or current matters. Forward-looking statements relate to anticipated or expected events, activities, trends or results as of the date they are made. Because forward-looking statements relate to matters that have not yet occurred, these statements are inherently subject to risks and uncertainties that could cause actual results to differ materially from any future results expressed or implied by the forward-looking statements. Many factors could cause actual activities or results to differ materially from the activities and results anticipated in such forward-looking statements, including, but not limited to, the factors summarized in the filings with the SEC. Amaranthus does not undertake any obligation to publicly update these forward-looking statements, whether as a result of new information, future events or otherwise.



Source: Amaranthus Bioscience Holdings, Inc.