FACT SHEETS:

NEUCARDIN™: A NOVEL FIRST IN CLASS THERAPY TO TREAT CHRONIC HEART FAILURE

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OVERVIEW: Zensun is developing a novel treatment for moderate and severe Chronic Heart Failure (CHF). CHF affects ~5.5 million people in the United States of America and cardiovascular death is the number one single cause of death in the world. There are no treatments for CHF other than heart transplantation that is extremely limited in number.

WHAT IS NEUCARDINTM? NeucardinTM is a portion of a naturally occurring protein known as Neuregulin-1β2α. Neuregulin-1 is found in the heart and by binding to receptors known as ErbB4 and ErbB2 found on cardiac muscle cells neuregulin-1 activates downstream signaling pathways important for cardiac function and structure. The presence of neuregulin-1 and its receptors has also been shown to be critical for normal heart development.

COMPOSITION AND ADMINISTRATION: After recombinant expression and purification Neuregulin-1β2α is formulated for parenteral administration via the subcutaneous route. Its appearance is as a white or whitish lyophilized powder. It is reconstituted in Sterile Water for Injection according to the subjects’ body weight and administered using a small external mini pump infusion device. During treatment, subjects can move freely.

HOW DOES NEUCARDINTM WORK? The reasons for the hearts inability to pump blood to the body are complex, but include structural abnormalities in the cell known as myofibril disarray (A). Once bound to ErbB4, NeucardinTM activates many key molecules that are involved in restoration of an ordered cardiac muscle cell structure and this includes strengthening of the connections between the cells by reorganization of the intercalated discs, thereby increasing contractile function (B).

In various animal models of heart failure, such as dogs with rapid pacing induced heart failure (C), NeucardinTM has been shown to reverse dilated cardiomyopathy, increase heart function and improve hemodynamics. In other animal models such as doxorubicin induced heart failure, NeucardinTM significantly increases survival rates (D).

WHAT IS THE PHASE OF CLINICAL DEVELOPMENT OF NEUCARDINTM? NeucardinTM is in Phase III clinical development in China and is now in Phase II clinical trials in the United States of America.

WHAT ARE THE RESULTS OF CLINICAL STUDIES? NeucardinTM has been given to over 400 people with CHF and over 1200 people have been involved in clinical trials in China, Australia and the United States of America. Phase II clinical studies demonstrate that NeucardinTM increases heart function in people with heart failure for up to 3 months following treatment (absolute ejection fraction increase of 5%), reduces left ventricular end systolic volume, and has a significant survival benefit compared with placebo in an enriched heart failure population.

WHAT ARE THE SIDE EFFECTS OF NEUCARDINTM? The main side effects are gastrointestinal disorders, such as nausea, vomiting and diarrhea. Some subjects also suffer from headaches and other nervous system disorders. Importantly, the side effects are alleviated after cessation of study drug administration.

WHAT ARE THE CONTRAINDICATIONS OF NEUCARDINTM? NeucardinTM should not be administered to cancer or pregnant patients or persons under the age of 18 years.

If you have any technical questions, please contact Bhawanjit Brar Ph.D. Senior Director for Product Development at bbrar@ZensunUSA.com

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