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Linnea Launches an Industry First: HMRLignan™ – Direct Enterolactone Precursor

LOCARNO, SWITZERLAND & EASTON, PA – August 17, 2005 – Linnea SA announced today the launch of an innovative lignan compound, HMRLignan™, a patented product developed in Finland by Hormos Medical Corporation, and manufactured and marketed worldwide under license by Linnea, Switzerland. Linnea SA is a specialist manufacturer of botanical extracts and phytochemicals for the pharmaceutical, dietary supplement and cosmetic industries.

HMRLignan™ is a breakthrough, in lignan research representing years of research to achieve an efficient dose response in lignan pharmacology encouraging the body's natural production of enterolactone as a direct precursor. Enterolactone is the human metabolite of plant lignans normally present in low concentrations as part of a healthy diet. Lignans were once common in the diet in grains and whole foods but nowadays are often removed from foods by over processing and mass production of foods. Epidemiological evidence relates low plasma enterolactone levels with increased risks of the development of cardiovascular disease and hormonally regulated cancers, especially breast cancer and prostate cancer.

There has been a steady growth of interest in the health benefits of lignans, such as flax, driven by the increasing pool of scientific knowledge in this area including compelling evidence from population studies and pharmacological research. Lignans are a major growth area in consumer interest and also a significant area sales growth in the dietary supplement industry.

“HMRLignan™ is a true dietary supplement offering a standardized and efficient method of replacing lost lignans in the diet,” said Michael Granville, President of Linnea SA. “We see

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HMRLignan™ as a way of building on the health benefits of lignans by providing an ingredient that overcomes the problems of dosing lignans such as flax lignans. HMRLignan™, a new generation low-dose, highly bioavailable lignan supplement, provides a more digestible alternative.”

Derived from the Norway spruce (*Picea abies*), HMRLignan™ will give formulators significant advantage in price, dosage and bioavailability compared with other lignan sources. As HMRLignan™ is not in a food matrix, it is characterized by a superior and proven pharmacokinetic and bioavailability. Other lignans, such as flax, are glycosides or diglycosides - bound to sugar molecules that must first be cleaved in the body before they can be metabolized into the target molecule enterolactone. HMRLignan™ is a pure lignan in the aglycone form (not bound to sugars) and upon arrival in a healthy intestinal tract, is more efficiently transformed into enterolactone – HMRLignan™ is the first direct enterolactone precursor dietary supplement. Once ingested, HMRLignan™ travels to the intestine, where a healthy environment of beneficial bacteria immediately go to work to transform it into enterolactone, the desired compound that is protective in human health.

Finland is a center of excellence for the study of phytoestrogens and it was researchers at the University of Helsinki who made the link between the research chemistry and the potential human health benefits of the wood derived lignan 7-hydroxymatairesinol (HMRLignan™) and its metabolism to the protective weak phyto-hormone and lower incidences of breast and prostate cancers and cardiovascular disease. This led to the partnership between Hormos Medical Corporation of Turku, Finland, and Linnea, Switzerland, and the success in bringing HMRLignan™ from the academic arena to the consumer.

Lignans have a soft phyto-hormonal activity. As HMRLignan™ converts directly into enterolactone, it is the enterolactone that binds weakly to estrogen receptors. Says Lauri Kangas, Ph.D., Senior Scientific Advisor at Hormos Medical Corporation, “diet selection and over-processing of foods has reduced daily lignan intake in U.S. women below established levels to maintain a protective soft phyto-hormonal activity and this is reflected in increased risks of major disease related to women’s health – breast cancer, cardiovascular disease, osteoporosis and menopausal symptoms.”

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In addition, HMRLignan™ is also a natural source in antioxidants, comparable to that of vitamin E, adding further protective benefit. Its ability to assist the body in directly producing higher levels of enterolactone coupled with the antioxidant activity make it an attractive compound for gender-specific formulas geared to post-menopausal women and middle-aged men and formulas targeted for cardiovascular health.

Studies have demonstrated that a mere 10 to 30 mg daily of HMRLignan™ in a single dosage is sufficient to elevate blood enterolactone to a protective level. “Compare one easy-to-swallow tablet or capsule to heaps of flax powder or spoonfuls of flax oil, or even handfuls of sesame seeds – every day,” Granville added. “And, by saving on dosage, manufacturers also realize great economic advantage.”

As a novel lignan source, the developers undertook extensive safety testing according to pharmaceutical GCP (Good Clinical Practice). In May 2004, New Dietary Ingredient (NDI) clearance from the FDA was obtained for the ingredient, allowing HMRLignan™, containing dietary supplements, to be marketed in the United States.

About Linnea

From its headquarters and manufacturing facility in Locarno, Switzerland, Linnea specializes in the manufacture of botanicals extracts and phyto-chemicals, and is a leading supplier to the pharmaceutical, dietary supplement and cosmetic industries. The company’s U.S. office is located in Easton, Pennsylvania.

About Hormos Medical Corporation

Hormos Medical Corporation is a biopharmaceutical company based in Turku, Finland, focused on research and development of products to treat a range of endocrine disorders associated with aging. The most advanced drugs in development are ospemifene for the treatment of conditions and symptoms associated with declining estrogen levels in postmenopausal women, and fispemifene for the treatment of androgen deficiency and associated conditions in elderly males, now entering clinical phase III and II, respectively.

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