

ASX Release

27 November 2014

TFS Indian Sandalwood oil outperforms in new acne and psoriasis research

- *Pre-clinical research conducted by University of British Colombia*
- *Pharmaceutical grade Indian Sandalwood oil more effective at controlling acne bacteria than benzoyl peroxide, the key ingredient in the most commonly used acne treatments, and equivalent in effectiveness to erythromycin*
- *Pharmaceutical grade Indian Sandalwood oil very effective at controlling the inflammation associated with acne and psoriasis*
- *Results highlight the potential of Galderma's new Benzac® products which launch in the USA in December aimed at a market of 40-50 million acne sufferers with a market size of more than US\$4 billion per annum*

TFS Corporation Limited ("TFS", ASX: TFC) today announced it has received the results from pre-clinical acne research conducted by the University of British Colombia, which found East Indian Sandalwood Oil (EISO) was more effective in controlling the growth of acne-causing bacteria and the inflammatory effects of acne than the most commonly used product in acne treatments, benzoyl peroxide.

The study also showed that TFS's pharmaceutical-grade EISO is as effective as erythromycin at controlling the growth of acne bacteria. Erythromycin is a frontline prescription only drug for the treatment of acne.

The research results are particularly important given the impending commercial release of Galderma's Benzac® Acne Solutions range in the United States, which contains TFS's pharmaceutical grade Indian Sandalwood oil.

The pre-clinical work by researchers at the University of British Colombia, Canada, studied the relative merits of EISO and benzyl peroxide in controlling both acne bacteria (*Propionibacterium acnes*, or *P. acnes*) and the inflammatory agents of the skin that thrive in the presence of *P. Acnes* (such as cytokines and chemokines).

The results found that a low concentration of EISO (0.001%) is as effective as 10% benzoyl peroxide in controlling *P. acnes* growth and is significantly more effective in suppressing levels of acne-induced skin inflammation markers in the human skin model.

"The research results clearly show that pharmaceutical grade Indian Sandalwood oil is more effective in controlling acne and acne-induced inflammation than benzoyl peroxide, with the added advantage that it is a naturally occurring product and does not dry out or irritate the skin like its chemically formulated competitor," TFS CEO Frank Wilson said.

“Importantly, EISO has been previously shown to be safe, non-irritating and non-sensitising, which is crucial when marketing EISO-based products over the counter.”

Mr Wilson said the results were important as they provided specific mechanisms of action for EISO that helped to explain the efficacy and safety observed in previous clinical studies.

“Given there are 40-50 million acne sufferers in the US alone, the demand for effective acne treatments is substantial given its US\$4 billion market size. These results are a further step towards capitalising on that significant market and auger well for the launch of Galderma’s acne product Benzac in December, given it contains pharmaceutical grade Indian Sandalwood oil,” he said.

Specifically the results showed:

- Prevention of P. acnes growth did not fully occur until a concentration of 10% benzoyl peroxide was reached, while a concentration of 0.001% EISO prevented P. acnes growth
- Benzoyl peroxide (concentration 10%) had no impact in suppressing acne-stimulated inflammatory responses, while the level of inflammation reduced by up to 90% when EISO (concentration 0.001%) was applied
- Erythromycin had no effect of the pro-inflammatory factors studied
- Low Concentrations of EISO (0.001%) are as effective as ibuprofen in inhibiting or eliminating the inflammation agents for psoriasis. Ibuprofen is a non steroidal treatment for inflammation.

Through the research Sandalwood oil had demonstrated a dual activity (anti-bacterial and anti-inflammatory) that other acne treatments such as benzoyl peroxide or Erythromycin could not provide, said Santalis CEO Paul Castella. The trial was conducted by the University of British Columbia, Canada, for Santalis, a joint venture partner of TFS. The results of the research are expected to be published in 2015 and build on previous research that the group has published on the anti-inflammatory effects of EISO.

“This data provides additional, convincing evidence to explain the effectiveness we have seen for TFS’s pharmaceutical-grade EISO in our ongoing clinical studies. The ability of EISO to safely control skin inflammation, in combination with its anti-infective and anti-proliferative properties, provides a compelling platform for the treatment of a number of important skin conditions, including acne, eczema and psoriasis,” Mr Castella said.

The University of British Columbia also studied EISO’s efficacy in controlling psoriasis on human skin models. EISO at a concentration of 0.001% was very significant in controlling the inflammation agents associated with psoriasis. In this disease, the inflammation agents cause the skin to hyper-proliferate and create the skin thickening and dryness, observed in psoriatic skin lesions. EISO controls the inflammation, reducing the hyper-proliferation and normalising the skin structure.

Nearly 3% of the world's population, or more than 125 million people, are affected by plaque psoriasis, with about two thirds of these suffering from its mild-to-mild-to-moderate form.

“This research and Galderma's impending launch of the Benzac acne range is just the beginning for the use of our pharmaceutical grade Sandalwood oil for dermatological conditions,” Mr Wilson said. “These results demonstrate that the potential for success in not just acne, but also eczema and psoriasis, is substantial.”

Both trials used a human skin model (MatTek EpiDerm™) to study the relative merits of EISO and BPO in suppressing the acne-induced release of inflammatory agents in a controlled environment.

EpiDerm consists of normal, human-derived epidermal keratinocytes (NHEK) which have been cultured to form a multilayered, highly differentiated model of the human epidermis. Ultrastructurally, the EpiDerm™ Skin Model closely parallels human skin, thus providing a useful in vitro means to assess dermal irritancy and toxicology.

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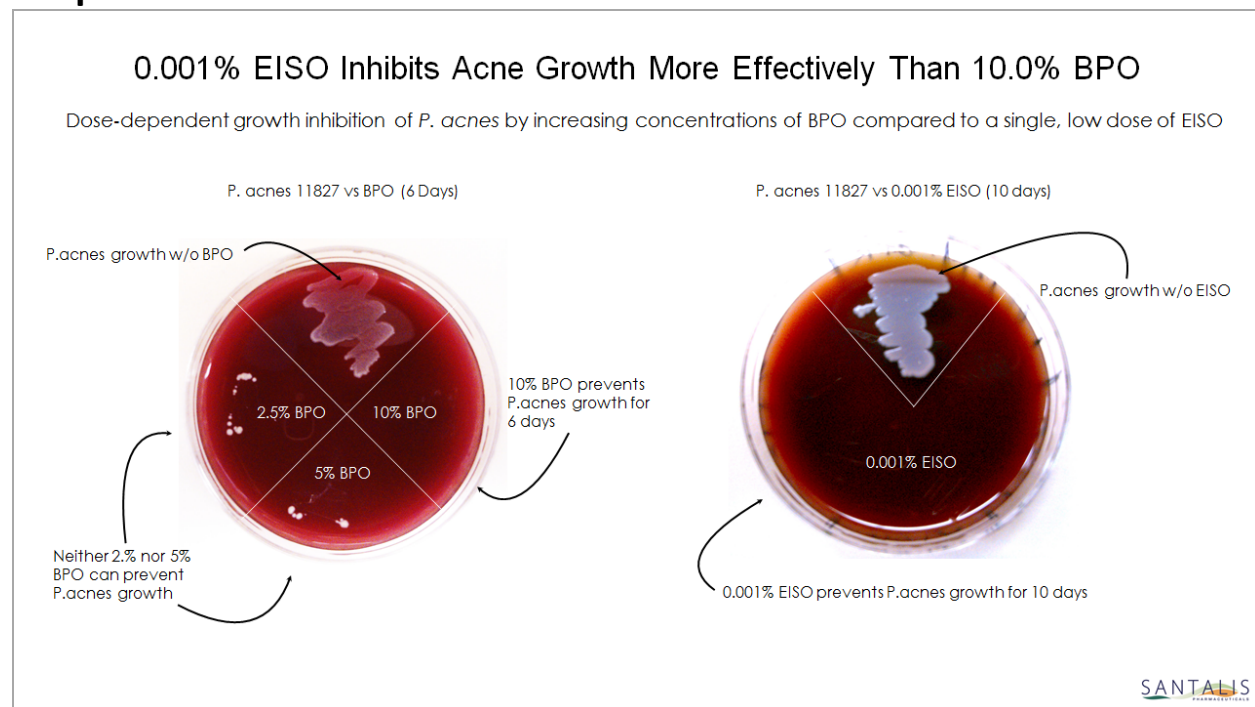
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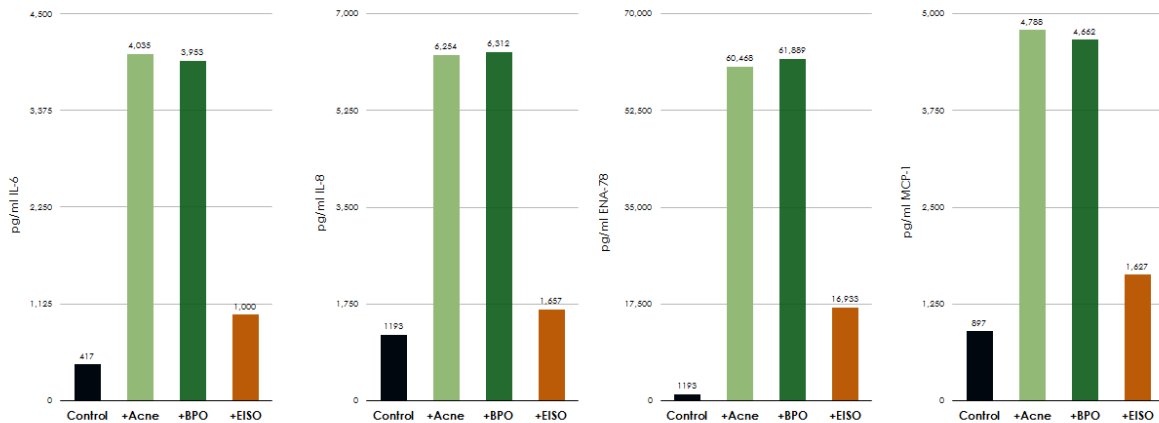
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Graphic illustration of research results



EISO, Not BPO, Suppresses Acne-Stimulated Inflammatory Responses in Reconstituted 3D Human Normal Skin Tissue

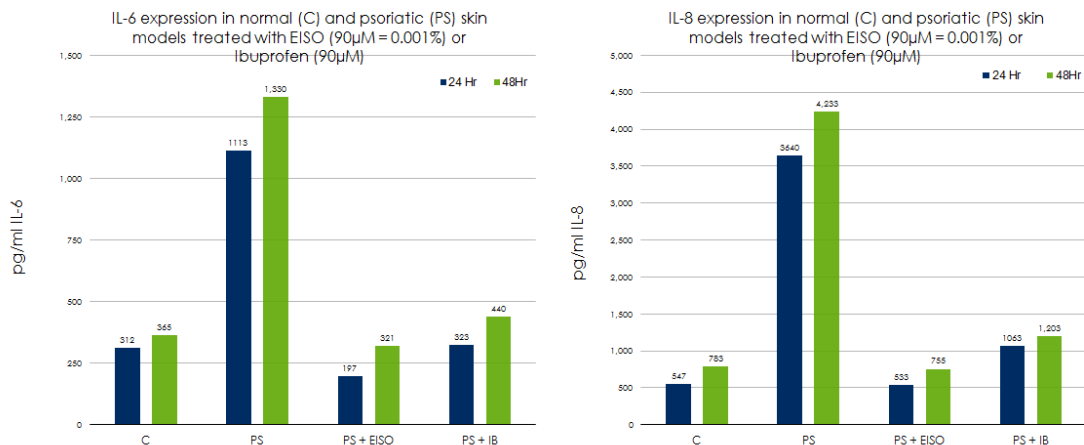


MatTek 3D human skin samples were stimulated by P. Acnes (ATCC strain 6919) to produce pro-inflammatory factors (IL-6, IL-8, ENA-78 and MCP-1). The levels of these factors were also measured after 48 hours of exposure to either EISO (0.001%) or BPO (10%). Acne greatly increase expression of the pro-inflammatory factors in the human skin samples.

EISO, but not BPO, greatly suppresses the inflammatory response.

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EISO Suppresses IL-6 and IL-8 Expression In Psoriatic Tissue



IL-6 and IL-8 elevation in EISO treated PS skin tissue is significantly suppressed compared to untreated ($p < 0.001$) and is indistinguishable from control

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Case Study:

Psoriasis Lesion Treated With 10% EISO Cream For 10 Days



Nov 10th 2014 Before Treatment

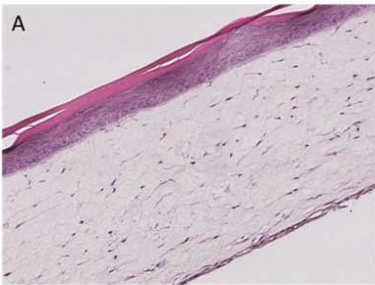


Nov 20th 2014 After Treatment With EISO10%

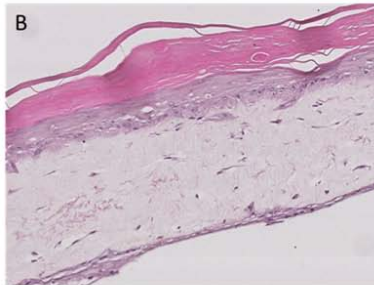
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Epidermal Hyperproliferation (Skin Thickening) Is A Hallmark Of Psoriasis

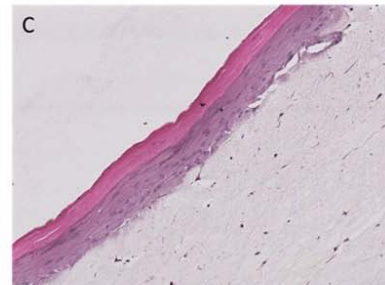
Low Concentrations Of EISO Are Effective In Reducing Or Eliminating Hyperproliferation In the MatTek Psoriatic Skin Model



Normal skin model



Psoriatic skin with thickened keratinocyte layers including invasion into underlying dermis indicative of hyper-proliferation



Treatment with EISO at 45 µM for 48 hrs shows decreased epidermal layer thickness and better organized stratum basale

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ABOUT TFS

TFS Corporation Ltd ("TFS", ASX: TFC) is an owner and manager of Indian Sandalwood plantations in northern Australia. As part of its vision to be a vertically integrated producer of Sandalwood products, TFS owns a significant proportion of the plantations in its own right. TFS also operates Sandalwood processing and oil distribution facilities from Albany, Western Australia.

TFS was originally founded to exploit the success of government trials into the plantation growth of Indian Sandalwood in the Ord River Irrigation Area (ORIA) of north-east Western Australia.

TFS now manages the largest area of Indian Sandalwood plantations in the world, with approximately 9,000 hectares planted of which TFS owns directly and indirectly nearly 3,200 hectares. TFS plantations are managed on behalf of both institutional, high net worth and MIS investors.

In 2014, TFS completed its first commercial harvest of its Indian Sandalwood plantations and, via its 50% subsidiary Santalis Pharmaceuticals Inc., entered into a supply agreement for pharmaceutical grade oil with Galderma, a leading global dermatology company.

The company listed on the Australian Stock Exchange in December 2004. Since March 2014, TFS has been an ASX300 company.

TFS is committed to adopting and maintaining the highest environmental and ethical standards in all aspects of its business.

ABOUT INDIAN SANDALWOOD

Indian Sandalwood has a history as a tradeable commodity spanning thousands of years, but is now endangered due to the illegal harvest of wild trees throughout the world. As a result, Indian Sandalwood is the world's most expensive tropical hardwood and continues to increase in price each year.

Indian Sandalwood oil is a globally important ingredient in fine fragrances, cosmetics and toiletries, Indian consumer products and for medicinal purposes (Ayurvedic and Chinese medicine) and the wood is used for high quality carvings and artefacts and religious worship in the Hindu and Buddhist faiths. The efficacy of Indian Sandalwood is being tested by US dermatology companies and the global pharmaceutical market has the potential to be a significant consumer of Indian Sandalwood oil.