



Technology Summary: Treatment of Atopic Dermatitis

Opportunity Statement

Atopic dermatitis is a chronic inflammatory skin disease characterized by areas of severe itching, redness, scaling and loss of the surface of the skin (excoriation). If eruption/rash persists for a long period of time, it leads to chronic irritation due to constant scratching and rubbing. Included among many types of eczema, atopic dermatitis is the most common form.

The skin of a patient with atopic dermatitis reacts abnormally and easily to irritants, food and environmental allergens and becomes red, flaky and very itchy. It also becomes vulnerable to surface infections caused by bacteria. The skin on the flexural surfaces of the joints (for example inner sides of elbows and knees) are the most commonly affected regions in people.

The most commonly affected population with atopic dermatitis is children, and the onset of symptoms usually occurs before age 5. Cases of atopic dermatitis can continue to persist through adulthood. According to a report conducted by Research and Markets, it is estimated there are over 40 million people suffering from a form of atopic dermatitis in the seven major markets of US, Japan, France, Germany, Italy, Spain and the UK.¹

Current treatment options for atopic dermatitis are primarily limited to symptomatic relief. These include the following:

- Topical corticosteroids
- Topical immunosuppressants
- Oral antihistamines
- Oral antibiotics
- Oral steroids
- Phototherapy

The most common treatments are topical corticosteroids and immunosuppressants. The market for treatment is driven by the increased prevalence of atopic dermatitis in the population and a need for a systemic treatment.

¹ http://www.researchandmarkets.com/reports/452390/stakeholder_opinion_atopic_dermatitis_a_high

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Problem

The treatments listed above all have the same problem of treating only the symptoms of atopic dermatitis instead of the root cause of the disease. The relief from the symptoms is only temporary and sometimes ineffective and has side effects including further skin irritation, a burning sensation and possible harmful effects for prolonged use on children.

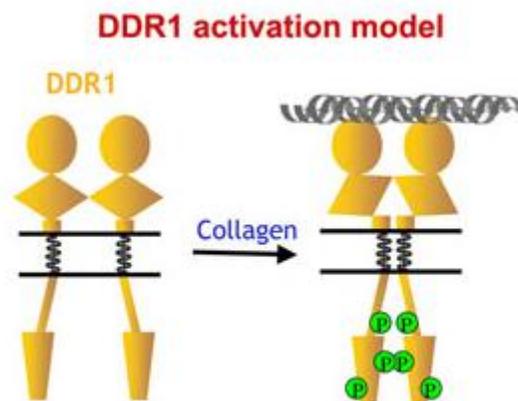
Therefore, there is a need for a systemic intervention that addresses the root cause of the disease.

360ip's Partner Solution

In atopic dermatitis skin lesions, the number of mast cells increase, which leads to an increase in histamines that are released by mast cells. Elevated levels of histamines are responsible for the accumulation of type I collagen. Further, elevated levels of IL-11 and eosinophil can also result in the accumulation of type I collagen.

Excess accumulation of type I collagen leads to enhanced activation of discoidin domain receptor (DDR) tyrosine kinase, which plays an important role in the developmental process in atopic dermatitis.

The figure below illustrates the activation of DDR1 by collagen:



The mode of action of the molecule developed by 360ip's partner has a systemic approach unlike conventional therapies that provide symptomatic relief. The molecule developed by the partner suppresses fibroinflammation by suppressing activated DDR tyrosine kinase. Fibroinflammation occurs due to the synergistic activation of inflammatory cells and fibrotic cells that leads to atopic dermatitis.

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The compound developed by 360ip's partner has the following key advantages:

- Suppresses fibroinflammation by targeting discoidin domain receptor tyrosine kinase
 - ✓ Current treatments only inhibit inflammation
- Inhibits fibrotic cell migration
- Inhibits focal adhesion & actin stress fiber
- Inhibits cell invasion and Akt1 activation
- Suppresses activated macrophage signaling

Atopic dermatitis and asthma share the basic pathological mechanism. Consequently, the partner also has begun studies on the application of its molecule for the treatment of asthma. Likewise, the partner has some promising data on the molecule's effects on wound healing and the reduction of scar formation.

Patents

360ip's partner has filed four families of patent applications on this invention.

Summary

360ip's partner has developed an intervention therapy which targets the root cause of atopic dermatitis as opposed to offering only temporary symptomatic relief.

360ip is seeking interested parties for the licensing, further development and commercialization of this technology-based solution.

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