

1.0 INTRODUCTION

1.1 Project Background

The purpose of the report titled: *Childhood Eczema: An Environmental Scan* is to provide significant information required to address key gaps that exist in the response to addressing the issue of childhood eczema. The summary of the environmental scan presents highlights and pertinent information for use in making major strategic and informative decisions. The report is a comprehensive look at the ‘state of affairs’ of eczema with a particular focus on childhood eczema from an epidemiological, clinical, research and resource perspective. This in no way represents an exhaustive presentation of all information available regarding childhood eczema. However, a full methodological description, detailed documentation of research processes and a complete bibliographic resource is included for future reference.

The project to date consists of two distinct parts. One, the background information is a culmination of information from the academic literature, gray literature, pertinent organizations associated with eczema, funding and granting agencies along with other electronic information sources that all provided an overview of the environment where research, clinical activity, programming and information exists surrounding eczema.

Following the environmental scan summary, a discourse is presented where gaps in research and resource needs were identified from the academic and gray literature and selected key informant interviews.

The report includes:

- I. A summary of an environmental scan inclusive of academic literature, gray literature, relevant organizations, electronic information sources and key informant interviews
- II. Bibliographic Resource

- III. A comprehensive resource of electronic sources and organizations relevant to childhood eczema
- IV. Summary of key informants and contact information

1.2 State of Affairs: Childhood Eczema

Eczema is a common skin disease characteristic of an inflammatory process whereby the individual suffers from redness, rashes, irritation and itching of the skin. Atopic dermatitis is among a category of allergic diseases that is complex and difficult to manage. The prevalence of childhood eczema has had a dramatic increase in parts of the world in the past 10 years. Global estimates, state 10-15% of the world's adult population is afflicted with this particular skin disorder. Similarly, 12-25% of children worldwide have eczema (1).

The etiology of eczema remains unknown although scientists and clinicians are beginning to understand the role of genetics, environmental factors and allergies have regarding eczema. Importantly, eczema has become a public health priority both in developing and developed countries (2-5). Notably, experts in the field of allergic disease have stated that it is possible that allergic disease may replace infectious disease in developing countries and should be prioritized and treated as a major public health priority (6;7). Issues surrounding the environmental triggers associated with eczema, complexities of diagnosis, challenges of complex treatment requirements and importantly increased quality of life require further investigation and understanding to reduce the morbidity and burden of illness for children and their families afflicted with eczema.

2.0 METHODOLOGY

2.1 Academic and Gray Literature Search: Databases

The academic literature was retrieved from the following databases: PubMed, CINAL, EMABASE, Sociological Abstracts and Scholars Portal Research and numerous electronic sources of information. Identified keywords were used along with other parameters that included

years 2003-2009 and English publications only. Appendix A: 'Bibliographic References' is a bibliographic resource and lists the results of the environmental scan.

2.1.1 Strategies and Keywords

In order to research all necessary elements in the environmental scan, it was important to explore lay and clinical terms associated with childhood eczema. Appendix B: 'Search Strategy: Keyword Summary' details the selected key words used in all searches that gathered information contained within this report. Initially, searches were performed using 'eczema' and followed by secondary terms such as 'atopic' and 'dermatitis'. Subsequent searches incorporated secondary terms e.g., epidemiology, treatment etc. The process continued until information was gathered using all the terms listed in Appendix B.

2.2 Websites and Organizations

The electronic information reviewed for the environmental scan used several search engines: Google, Google Scholar, Google Chrome, and numerous RRS Feeds. Additionally, a collection of electronic references were incorporated into both the gray literature search and the final report. For a complete list of organizations and electronic resources see Appendix C: 'Organizations and Electronic Resources: Information and Blogs'.

2.3 Key Informants

The selection of the Key Informants was executed by the epidemiologist commissioned for this project. The selection criteria was based on gathering a cross-section of identified champions with backgrounds in academic research, clinical experience, alternative treatment and healing and experts in food allergies. Additionally, it was important to have broad global representation thus informants were chosen from Canada, United States, UK and Australia. Each key informant was interviewed using a semi-structured interview guide and were asked questions regarding research priorities and resource needs in the area of eczema. The key informant interview elements are incorporated in the final report and referenced in the report where

necessary.

For a complete list of the selected key informants and the semi-structured interview guide see Appendix D: Selected Key Informants and Appendix E: 'Key Informant Interview Guide'. Note, the final column of Appendix E provides information on whether or not the key informant interviewee has been contacted and if the interview is completed. The key informants, who provide relevant and specific information in this report are referenced in the body, see bibliography listing for further details.

In all of the completed interviews, there were recurring themes surrounding the need for research in the area of environmental triggers and allergies along with a crucial need for health care professional and patient education in the area of atopic dermatitis. For example, clinicians on the front line such as general practitioners and pediatricians require comprehensive treatment education whereas patients need access to the same information in lay terms so they can work effectively with their health care team.

3.0 FINDINGS FROM THE ENVIRONMENTAL SCAN

3.1 Introduction

The following section of the report provides an overview according to specified topic areas regarding childhood eczema. Initially, the section begins with an in-depth look at the epidemiology of childhood eczema. The epidemiology is followed by a discussion about the causes and triggers of childhood eczema and details of other health issues and concerns children afflicted with eczema may also suffer from. Next, the environmental and psychosocial factors related to having the chronic condition is presented in order to understand the burden of illness suffered by children, their parents and families as they live day-to-day. Finally, the overview by topic area concludes with a discussion surrounding conventional treatment and alternative therapy highlights.

3.2 Topic Areas

3.2.1 Epidemiology

The term atopic dermatitis is a general reference to many different types of skin disorders whereas 'atopic' refers to the preponderance to develop allergic sensitizations. Specifically, eczema presents as eruptions of the skin that are red, inflamed areas with or without scaling. As the eruption continues, it may progress into a thick grooved patch that can blister or crack. The most rampant symptom of eczema is itching that can be very severe. A common form of eczema is atopic eczema that affects the entire body especially creases or folds in the skin and is frequently found on the face, behind the ears, front of the elbows, hands, back of the knees and trunk area of the body.

When a child is initially afflicted with eczema as an infant, eczema often appears between 2 and 4 months of age and frequently occurs on the facial area. As the child grows older, other areas of the body become affected such as the arms and legs, particularly behind the knees, in elbow creases and in the hand and wrist area. A rash begins and the most irritating and frequent symptom is itching. The itch-scratch cycle then breaks the skin, inflaming and irritating the skin even further and importantly allowing the penetration of foreign substances into the body through the broken skin barrier. Commonly, a child who is going to develop eczema will show symptoms by the age of 2 years. Furthermore, approximately 70% of children who suffer from eczema are expected to out-grow the condition by age 11 and show no permanent scarring (6) but this is not the case for all children and some individuals will continue to have the disease into adulthood (See Appendix F: 'Types of Atopic Dermatitis' for a list of common types).

Worldwide, approximately 12-25% of children between the ages of 6 months and 5 years are afflicted with eczema (4;8). Studies have demonstrated that approximately 50-75% of children are symptomatic before the age of 6 months and up to 90% by the age of 5 years. Furthermore, 60% of those children will have eczema after puberty and nearly 15% will continue to remain afflicted with eczema into adulthood. Alarmingly, the prevalence of childhood eczema has almost tripled since the early 1970's (9). Additionally, the past 10 years have seen rapid increases in the prevalence of eczema, which researchers now suggest are likely impacted by environmental factors (10). The largest epidemiological study ever completed in child health is the International Study of Asthma and Allergies in Childhood (ISAAC), lead by Professor

Williams at The University of Nottingham. The purpose of the study was to examine allergic disease through the analyses of information derived from survey data between 1991 and 2001 of over 450,000 children in 55 countries. The children were 6-7 and 13-14 years of age at the time of data collection. Results showed a less rapid increase in the number of children ages 13 and 14 who have eczema along with a decrease in some previously high geographical areas such as the United Kingdom and New Zealand. However, across developing countries and among younger children ages 6 and 7, the prevalence of eczema continues to increase. In concluding the results of the ISAAC study, Professor Williams stated that the cause of eczema, although not fully understood is a multi-factorial issue and attention to both genetic and environmental factors are necessary. Additionally, he stressed the possibility of eczema being a preventable disease with better understanding and that effective management strategies are known thus, it is important to remain vigilant in the evaluation of eczema components globally in order to illuminate how patients, clinicians and researchers may successful understand, cope and manage eczema.

3.2.2 Causes and Triggers of Childhood Eczema

3.2.2.1 Personal Hygiene

Among eczema research it is now well understood that an individual's use of soap and other bathing products (shower gels, bubble baths) along with baby wipes are all linked to both the development and flare ups associated with eczema. Simple breakdown in the skin's barriers leave cracks and the ability for irritates to penetrate the protective barrier of the skin, which can result in the development of lesions. Estimates suggest 1 in 5 children develops eczema because of the increase in using such products.

3.2.2.2 Pharmacology

Regarding the use of acetaminophen (paracetamol), a recent study (the ISSAC programme) found that among children who were 6-7 years old, the use of acetaminophen in the first year of life was associated with both an increase in the likelihood of eczema and asthma. In addition, the researchers stated that children with eczema, asthma and nasal allergies were more

likely to use acetaminophen thus, research into pharmacology is still necessary and on-going and further investigation into the relationship between acetaminophen and possible increases in the likelihood of asthma is warranted (11) (12).

3.2.2.3 Hygienic Hypothesis

Dr. Sami Baha, the chief of Allergy and Immunology at Louisiana State University Health Sciences Centre and other leading clinicians suggests the 'hygienic hypothesis' is responsible for impacting the current increasing prevalence trends of childhood eczema. The hypothesis is based on the fact that many children, especially those living in the West have immune systems that are deficient in normal processes of identifying and attacking 'invaders' of the body. When children are increasingly exposed to sterile environments from birth, their immune systems do not develop normally by being challenged by various pathogens. Factors such as the use antibiotics and vaccinations, along with an emphasis on antibacterial soaps, creams and cleaners produce an environment whereby the immune system does not receive adequate exposure to develop normally and fight infection. As a result the overall system can become hyperactive (13;14).

Specifically concerning vaccines, some researchers have focused on possible links between vaccinations and the incidence of both eczema and asthma. A study published in the UK in 2004, examined vaccinations for diphtheria, polio, whooping cough, measles, mumps and tetanus and found that there were no significant risk factors for either eczema or asthma (15). Similarly, Bernsen reported a lower risk of atopic disorders in the whole-cell pertussis vaccine when comparing results with children who did not have the immunization (16) However, it is widely understood that individuals with eczema should not receive the smallpox vaccine. A U.S. study noted the importance of knowing an individual's dermatological history with respect to atopic dermatitis and specifically eczema before receiving the smallpox vaccine as individuals with eczema may develop eczema vaccinatum when either they themselves or someone who is in close contact receives the vaccine (17).

3.2.2.4 Genetics

Although the definitive cause of childhood eczema remains complicated and unclear, research during the past 25 years has led to many hypotheses including genetic factors, environmental triggers, allergic origins and stress conditions (8). Family history is widely accepted as the strongest predictor of whether or not a child will develop eczema. Genetic predisposition, such as whether the child has a parent or sibling who has eczema, asthma or hayfever is associated with a higher risk of developing the disease. Specifically, estimates suggest that if either parents (or a sibling) are afflicted with eczema, hayfever or asthma, their child has a 50% chance of also having eczema. Similarly, if only one parent has any of the former conditions and older siblings are not afflicted, the child's risk falls to 25% (18).

Specifically, research in the area of the association between genetics and the development of eczema has identified particular variants in the fillagrin (FLG) gene as factor in the predisposition to eczema and has been replicated in numerous studies (19-21). A mutation in the fillagrin gene impairs a barrier within the skin that results in penetration of allergens and irritants. Additionally, the variant is also believed to be associated with food allergies. Importantly, research out of Ireland had noted that when an individual has two specific mutations of the fillagrin gene together they are very susceptible to atopic conditions, which increases their risk of eczema and specifically may be associated with a form that begins in infancy and continues through to adulthood (21). The variant in the FLG gene alone however does not explain the development of eczema. Under normal conditions, fillagrin is found in the skin and performs the function of a protective barrier protein. For individuals with the variant, researchers believe a catalyst, such as an exposure to allergen triggers eczema and then the variant in the gene prevents the immune system from working effectively.

Additionally, genetic research has also uncovered the gene associated with itching or the 'itch-sensation' as the GRPR (gastrin-releasing peptide receptor). The hope in this area of research is to develop treatment options that will effectively impair the messaging of the itch in the body and bring relief to those who suffer chronic itching symptoms such as eczema patients (22). The exact association between genetic factors and eczema are not well understood; however, there is consensus among researchers and clinicians that having a genetic predisposition can make a child more susceptible to developing eczema but genetic factors may not be sufficient on their own to cause the disease (9).

3.2.2.5 Allergies

A substantial trigger associated with eczema is allergies. Numerous agents causing allergic reactions are thought to have an association with eczema including environmental allergens such as house dust, dust mites, cockroach allergens, outdoor air pollen and pet dander; however, the true relationship between atopic sensitizations and allergic disease is poorly understood (23). A particularly difficult situation surrounds dust and dust mites as they are near impossible to avoid. When an individual already has eczema and the skin is damaged, the exposure to an allergen further impairs the protective layer of the skin to heal thus leading to more severe symptoms.

It is well known that pet dander causes an allergic reaction for many individuals and that an exposure to animals for people suffering with eczema and asthma can be a very serious reaction. Research out of the University of Manchester and Copenhagen has specifically examined the link between cats and eczema. Importantly, researchers have found that in children who are predisposed genetically to eczema and who are also exposed within the first year of life to cats increased the risk of developing eczema to that 4 times greater than for children who are not exposed. The exposure to dogs had no effect. Other research has suggested exposure to not only cats but other animals in fact provides a protective effect against eczema by exposing children to various allergens and bacteria early in life to stimulate a healthy immune responses (to contradict the effects of the hygienic hypothesis discussed above). Conversely, additional studies focused on pets have suggested that having a bird in the home may reduce eczema. The hypothesis is that when children are exposed at a young age to the bird feathers, which contain toxins their immune system responds and during early development this exposure may prevent allergies. Finally, another body of investigations in the area of the correlation between allergies and the severity of eczema showed that only those children who were considered severely afflicted with eczema and who may also report difficulties in responding to treatments are likely to be further adversely affected by allergens such as grass and domestic animals (24).

Another extremely difficult issue to manage in the area of childhood eczema and allergies is the area of food sensitization. In 2008, the CDC reported that 27% of children who had food allergies also reported either eczema or a skin allergy (25). Any child with a food allergy is

estimated to have 2 to 4 times a higher risk of having eczema, asthma or other allergies. Data briefs out of the CDC state between 1997 and 2007 the diagnosed cases of food allergies in children in the United States rose 18%, which translates into approximately 3 million children or 4 in every 100. Similarly, in 2008, Dr. Hanifin speaking at a dermatology conference in the US estimated that up to 40% of children, who experience eczema as infants and young children will go on to develop food allergies. He emphasized that public education must include dispelling the *common myth that food allergies cause eczema and that in fact the sequence of events is the other way around*. Similarly, research in Australia has reported that the earlier a child develops eczema in their life and the greater the severity of their condition are both markers for increased prevalence of food sensitivities (26)

Notably, parents experience, on a daily basis the impact food their child has eaten and associations with eczema albeit do not necessarily know which food is causing a specific reaction. It is extremely frustrating and difficult for parents to manage this issue of their child's disease. Clinicians state that the skin is highly susceptible to the food we ingest and that a person's skin is a reflection of not only their overall health but of the specific state of the bodies' hormone balance and immune system. It is understood that certain foods are known to have a clear association with eczema and 90% of all food allergies are attributed to 8 foods: milk, eggs, peanuts, soybeans, fish, shellfish, wheat and tree nuts (25); however, the specific mechanisms by which the reactions take place are elusive. Importantly, some food allergic reactions are not restricted to having to ingest the allergen. For example, some children may be so sensitive to certain food items that simply having their skin come in contact with such a trigger can cause anything from a flare up of hives and/or an outburst of eczema all the way to a life threatening anaphylactic shock reaction. Furthermore, not all food allergens are confined to edible items. Some elements can be found in other areas of their environment such as cosmetics, making the avoidance of certain allergens very difficult as the overriding concern is the severity or sensitivity of food allergies that continues to rise.

3.2.3 Co-Morbid Conditions: Asthma and Rhinitis

Both asthma and rhinitis are well known co-morbid conditions of eczema (27;28). A

great deal of attention has focused on children with eczema and further development later in life of asthma and other allergies or the 'allergen sensitization'. Although a difficult issue to untangle and to clinically understand, findings from numerous clinical studies have shown the direct association between childhood eczema and the onset of asthma even into later adult years; childhood eczema is not simply a child disease but may have serious life consequences later in life (27).

In Australia cited results that show the risk for people developing asthma, who were sufferers of childhood eczema was double that of their peers who did not suffer with the skin disease. Furthermore the Journal of Allergy and Clinical Immunology recently reported that 46% of children who have eczema also develop asthma and in 2007, 29% of children in the United States with food allergies also suffered with asthma (25). Work done on the Childhood Asthma Prevention Study showed definitively that eczema as opposed to childhood wheezing or rhinitis may be largely responsible for allergen sensitization when the child become older, such findings support the position that early clinical management of eczema is important in impacting later life allergy development (29)

Rhinitis, which is best known as a runny nose is the clinical reference to nasal membranes that are irritated or inflamed caused by irritants such as bacteria or allergens (30). Common types of rhinitis include non-allergic (vasomotor), allergic and hayfever. The importance of asthma, rhinitis and eczema are the common occurring allergic associations and the need to manage and treat all manifestations of atopic disease holistically. Thus, research must also include a comprehensive approach in investigating childhood eczema, asthma, and rhinitis and acknowledge the interplay of all components to effectively help children and their families dealing with atopic disease and subsequent allergic sensitivity.

3.2.4 Environmental Factors

Much attention has focused on the environment and its association to eczema. In particular, factors and patterns of the environment from both the outdoor environment and the indoor microclimate have shed light on how the environment impacts individuals with eczema.

Within the home, humidity levels and the level of ventilation can worsen eczema conditions. McNally and associates reported a statistically significant association between eczema in children and increased humidity in the home and excessive heat and dryness specifically in the child's bedroom (31).

Not only are air quality issues a concern in the fight against eczema but a whole host of chemicals and toxins throughout the environment, both known and unknown are believed to play a role in the development of eczema and exacerbation of symptoms. For example, in July, 2008 the Eczema Natural Treatment website posted an information piece describing the use of dimethyl fumarate in furniture production (used to prevent mold). This highly sensitive agent is known to cause serious harm among individuals who are exposed thus, the use of dimethyl fumarate in manufacturing poses a serious risk at large and specifically for individuals who already have eczema. This is only one example of the numerous chemicals found in our everyday environments that not only affect overall health but may be particularly devastating to individuals with certain sensitizations.

Concerning the outdoor environment, for example actual weather patterns, can affect people suffering with eczema. Various seasons can impact eczema such as the cold in winter causing skin to become drier and increasingly itchy whereas, warmer temperatures and sunny conditions have promoted the remission of eczema for many. However, in very humid and hot environments sweat can increase suffering. An increase in symptoms of eczema in the spring and summer climates is likely an indication of seasonal allergies where reactions to pollen are influencing symptoms. See Appendix G: 'Environmental Triggers' for a list of more common environmental triggers of eczema. In Germany, researchers specifically examined the influence of daily temperatures, humidity, radiation and pollen levels in the air. Their findings showed seasonal variations are very different among children and no one pattern is applicable to all. Some children showed worse symptoms as the air temperature dropped and others were highly influenced by pollen, which made their itch symptoms much worse. Overall, the results of the study highlighted the need to more fully examine not only seasonal variations of symptoms among children with eczema but also include detailed work surrounding the relationship among climate factors and specific types of eczema to better understand the impact of different seasons (32).

There are sparse epidemiologic studies that specifically examine air pollution (outside) and climatic factors and their association with eczema. The ISSAC programme has shown an increased likelihood between air pollution and the prevalence of eczema in children (33). Similarly, very recent work completed in Taiwan supports the hypothesis that air pollution and climatic factors may impact the development and severity of eczema. Lee and associates looked at data from air monitoring stations and the prevalence of eczema among 300,000 plus school age children. Results showed eczema was associated with air pollution from traffic (the nitrogen oxides and carbon monoxide). Additionally, the relative humidity levels were also associated with eczema. Overall, their work does show an association between air pollution elements and climatic factors with respect to eczema (34). Clinicians and individuals with eczema are well aware of how eczema flare-ups and symptoms are influenced by particular seasons; however, there is little scientific research that has investigated how specifically this happens.

Another aspect of the environment under investigation is the Urban versus Rural question. Research out of New Zealand, Greece and Germany has all focused on possible exposure characteristics between living in a rural versus urban population and the development of eczema in children. As may be expected, long term exposure in the urban environment is associated with hayfever (35) and air pollution as discussed above. Conversely, there was a protective affect found when examining the prevalence of eczema in those children who had long term exposures in the rural environment where they were found to develop eczema less often.

Over 1,300 children born to mothers who lived on a farm during their pregnancy had a 50% lower risk of developing eczema and hayfever along with a reduction in asthma. Results of this study render further support for the hygienic hypothesis (see Section 3.2.2) by suggesting that children who are exposed to bacteria and animals may have their immune system challenged at the fetal stage of life; however, the protective effect may only continue if the child continues exposure after birth (36). Conversely, work out of Germany has shown there is a link between the development of child allergies and environmental pollution. Allergies such as eczema, hayfever and asthma were 50% higher in children who resided near major roads. Various factors such as climatic zones, altitude, humidity levels, pollutions levels, ground level ozone and outdoor pollen are areas where researchers are interested in continuing their investigations to uncover factors associated with the symptomology of eczema among all age groups (37).

3.2.5 Psychosocial Factors

The area of psychosocial factors regarding eczema is extremely important. Specifically, childhood eczema is known to have a dramatic impact on children from infancy through to teenage years. Although many children will outgrow eczema by the age of 11, the years leading up to this are crucial for personal and social development. The stigma associated with visible outbreaks of eczema is difficult to manage and for young children and teenagers, their self-esteem at particularly crucial times of development is affected. In addition, social interactions and participation in social activities are hindered. It is well documented that all skin diseases negatively impact quality of life and often individuals with eczema have low(er) self-esteem thus, emotional support in the form of support groups or other social organizations like a child's camp can help close the gap on a child feeling isolated and provide a comfortable opportunity for social interaction with other people who share similar experiences (38;39). The stigma attached to having a condition that requires constant management, alienates the child from social situations and that severely impacts their family unit are all concerns that lay beyond the clinical understanding and management of how to diagnose, treat and manage the disease over the life course.

For parents of a child suffering with eczema, the discomfort and severe itching interrupts both the child and parental sleep cycles thereby worsening the entire families' ability to cope and manage the eczema. In addition, pharmacological treatment such as antihistamines may also leave the child lethargic and irritable in the morning. Parents and children become sleep deprived and a parent's ability to perform day-to-day activities is hampered whereas children may display behavioral issues due to a lack of proper and restful sleep. Similarly, throughout the life cycle scholastic, work and professional activities are affected by eczema through lost participation rates, illness days and the psychological factors such as avoidance of social situations associated with having the disease or caring for someone who is afflicted.

Emotional stress affects both the child and parent and for the child their stress can affect the severity of the disease. For example, at the height of the summer season when a child is

unable to wear comfortable clothing for weather conditions such as shorts and t-shirts either because exposing their skin may worsen the condition or they are self-consciousness in exposing skin that is flaring with an eruption affects both the child and the parent. Similarly, stress itself can worsen an individual's eczema, which is particularly important in cases of childhood eczema that continue through the teen years.

Specifically, research has investigated the relationship among stress reactions such as frustration and anger and the 'itch-scratch' cycle. However, among researchers it is acknowledged that the association between immune reactions and stress remain elusive and requires further research. In their systematic review of the literature regarding the impact of childhood eczema and stress, Hawkins summarized several different studies that showed children with more severe eczema also had an increased risk of certain psychological problems such as somatic complaints including stomach problems and excessive worrying. In addition, some research has uncovered conduct problems and children experiencing bullying at school (39;40). Support and programs aimed at reducing anxiety and depression is paramount for children in order to reduce the overriding burden of illness suffered by these children and subsequently their parents (39)

For a parent of a child with eczema the emotional stress can be overwhelming and the grief of what their child must endure is very real. Parents often feel guilty and have a difficult time watching their child suffer in pain and discomfort along with feelings of helplessness in not being able to either bring relief or eradicate the disease all together. Similarly, parents may become overwhelmed by severe sadness at what their child is missing in their young life. There are feelings of anger to others who stare, tease or are simply ignorant to their child's suffering. Importantly for the family unit, the culmination of exhaustion, stress and emotional roller coaster for parents affects relationships and the marriage just as any chronic on-going stressful situation would for any family. Research published in the Archives of Disease and Childhood states that mothers of children with eczema showed stress levels that were on par and equivalent to mothers whose children had severe developmental and physical problems (4;40). This is an important finding for parents whose child (ren) are afflicted with eczema and requires further public

education to help ease the burden of illness for families.

3.2.6 Conventional Treatment

Obtaining the right diagnosis and treatment for eczema is complex and is often difficult for parents and clinicians to find the right combination of therapies that work and that continue to work over time. Optimally, it is best to keep the skin healthy and attempt to heal the skin as promptly as possible when flare ups do occur. Conventional treatment for eczema includes the use of skin hydration products designed to moisturizes the skin and steroid topical preparations which reduce the inflammation associated with eczema flare ups (41) although not without some serious side effect for certain individuals. An exacerbating symptom for sufferers of eczema is itching, which is often treated with antihistamines. Additionally, secondary infections can occur from the scratching and when are treated with various antibiotics. See Appendix H: 'Treatments' for a list of common prescription and non-prescription treatments for eczema. A relatively new class of treatments are available known as topical calcineurin inhibitors (TIMs) (42). The hope for this particular class of agents is that they are steroid-free. TIMs work with the immune imbalance in the skin. In particular, they work by suppressing the immune response, which for many patients improves their eczema significantly. More research in the area of TIMs is required; however, at this time they do offer a steroid free option of treatment (1). However, given TIM's are relatively new and no long-term studies have been completed, the risks of use over time remains unknown. Finally, light therapy and/or the use of light therapy in conjunction with other approaches are becoming more common.

Within the past 10 years, research has focused on ways the diet can improve conditions associated with eczema. Several studies published in the medical journal the Lancet between 2001 and 2003 discussed the advantage of children ingesting good bacteria such as probiotics and other forms found in foods such as yogurt or milk enriched with acidophilus. It was found that babies, who suffered from severe eczema, had higher levels of E coli and bacteroids in their stool samples. Additional research conducted in the Netherlands has also identified that the gut microbiota make up of infants that contained both E. Coli and Clostridium difficile were at an increased risk of developing eczema, recurrent wheeze and allergic sensitization (13).

Furthermore, review of the literature suggested there are beneficial aspects of ingesting probiotics whereby, probiotics have shown to mediate the immune system and have a positive effect on both the treatment and prevention of food allergies (43).

The majority of research conducted in the area of probiotics has taken place in Europe and Australia. Children who had probiotics as part of their diet over time were both less likely to develop eczema and for those who showed symptoms, their eczema improved (44). Dr. Abrahamsson of Sweden showed that expectant mothers who took probiotic supplements late in their pregnancy and continued to give their child such during their first year reduced the incidence of IgE associated eczema and notably had less sensitivity to the skin-prick test. To date, no conclusive evidence of the benefits of probiotics exists and one underlying methodological problem in the research is that each study is often testing a different combination or formulation of probiotics thus it is difficult to produce conclusive statements. Researchers agree the more work needs done in this area and replication studies may provide the evidence based information required to show that probiotics are effective in treating eczema.

A Swedish study published in the *Archives of Disease in Childhood* by Bernt and McMahan has shown that infants who began eating fish (regardless of what type) prior to 9 months of age were 25% less likely to develop eczema. The study looked at various types of fish in the diet, namely white fish, mackerel and tuna and the particular type of fish did not appear to be a factor. This finding contradicts nearly 10 years of previous recommendations, including those from the American Academy of Pediatrics, where introducing fish before the age of 3 years old could in fact lead to allergic responses and possibly to the development of eczema. These former dietary recommendations for children were revised in 2008. Similarly, a German study found improvements in eczema symptoms when patients took daily supplements of Omega-3 (5.7g/day) compared to those who took the placebo. By measuring symptoms on the SSAD (Severity Scoring of Atopic Dermatitis), researchers were able to show an 18% decrease in symptoms of patients who took the Omega-3 supplements (March, 2008).

Other foods that remain high in antioxidants such as certain types of grapes and blueberries and items that are full of Vitamin C and A such as oranges, carrots and broccoli are

all considered good for skin health. Naturopathic doctors and nutritionist stress the importance of hydrating the skin and recommend 8-10 glasses of water each day along with dietary choices that include omega 3 to aid in keeping the skin supple and aid in the prevention of eczema outbreaks. However, many children suffer from food allergies and getting the right nutrients and avoiding others that tend to cause problems for those suffering with eczema can be extremely challenging.

Overall conventional treatments of behavior modification in conjunction with some form of topical application have shown to provide the best outcomes for patients with eczema. This treatment approach uses the traditional topical therapies in combination with teaching the patient to learn, modify and ultimately control their behavior such as reducing the amount they scratch their skin. By combining therapies, the topical treatment reduces inflammation and the behavior modification reduces the amount of scratching, which together allows the skin to heal, reduces flare-ups and prevents secondary infections. Furthermore, other added benefits of the behavior modification are an increase in the patient's understanding of how to use skin moisturizers effectively along with understanding the importance of adhering to their treatment plans. This approach is widely used in the UK and has proven effective.

When treating eczema it is imperative to understand that there is no one treatment modality that works and most people with eczema use several types of treatments in combination with each other. Furthermore, it is very common for a treatment to work at times and then the patient will suddenly find the chosen treatment does not bring relief thus, a new option must be started. An extremely difficult challenge for children and parents is their adherence to the treatment regime, which if not followed diligently can lead to a worsening of symptoms, more frequent outbreaks and secondary infections. It can be difficult to find out exactly what to do in treating eczema and then following the treatment course. Patient education and in the case of childhood eczema the education of parents in the process and management of eczema is vitally important to finding the best combinations of effective treatments in order to successfully treat eczema (42;45). Additionally, research into the understanding of stress and the effect on eczema flare-ups continues and we do know that dealing with stress through biotherapy, certain massage techniques using essential oils, muscle relaxation exercises and meditation are showing positive

preliminary successes in dealing with eczema, although more research is required, it is likely we will see the addition of stress reduction incorporated into treatment plans for people with eczema.

Finally, Chang and colleagues point out that a large challenge in developing new treatments in the area of childhood eczema is attributed to the “failure in translating basic science information in clinical application” (46). Moreover, the key informants interviewed as part of this project repeatedly raised the concern of having scientific information translated to both front-line clinicians such as primary care physicians and pediatricians along with having the same information made available in lay terms to the public is of paramount importance. Our key informants stressed the need for better communication between parents and their clinical caregivers as well as information being made available to educators, daycares and anywhere else children spend time in an educational or social setting (40;47;48)

3.2.6.1 Primary Care Treatment and Eczema: The Health Care Team

The importance of parents and health care providers working together in the treatment of childhood eczema cannot be overemphasized. It is pertinent to remember that many of the funding models for primary health care, where physicians and nurses are often front line workers for patients and particularly parents whose children have eczema often do not allow for optimum patient education, primarily because consultation times are in high demand and restricted. (49). Importantly, primary care providers should be aware of the difference in patterns of presentation of eczema along age and gender characteristics to provide the best diagnosis and treatment along with understanding predisposition characteristics not only to eczema but asthma as well (17;50;51).

Research out of Australia demonstrates the importance of the transdisciplinary nature of the health-care team in treating patients with eczema. Children with mild to moderate eczema who were treated by nursing staff showed considerably better treatment outcomes compared to children who were treated with by either a dermatologists or pediatricians. Conclusions of the study suggested that the amount of time spent with the children by the nurses compared to other clinicians (90 versus 40 minutes respectively), the consistency of bathing, application of emollients and management of wet dressing all led to improved patient outcomes. The findings

illustrate the importance of the patient centered model of care and the role allied health care professionals have in providing better quality of care for patients beyond the sole primary care physician and pediatrician (49).

3.2.7 Alternative Therapies

A plethora of natural and herbal or alternative therapies in print and electronic information pertaining to eczema is available. There exist large discrepancies in both the academic and gray literature surrounding the effectiveness of alternatives therapies such as homeopathic treatments. Although much work remains in scientifically examining the effectiveness of alternative therapies, a study published in 2008 which was a comparator investigation of the effectiveness of homeopathic treatment versus conventional approaches demonstrated that both treatment approaches were effective in improving the symptoms of eczema and the quality of life as reported by the patients and/or parents in the study (52). Particular herbs, teas and food supplements state claims of relieving eczema symptoms even curing the condition all together. It is beyond the scope of this report to either back any claims of such alternative items or refute the possible role they may play in managing and treating eczema. However, the following discussion will outline the more common or popular natural/herbal approaches in eczema care along with highlighting certain other alternative therapies such as Chinese medicine.

For sufferers of eczema and their caregivers, one of the most important points to consider is that any product that is labeled 'natural' or 'herbal' may cause serious side effects if taken even when the product relieves eczema symptoms. Such effects can include liver toxicity and kidney damage. Furthermore, reactions are not isolated to items that are ingested, topic applications; especially those that contain corticosteroids have long term adverse effects. The use of chamomile tea remains poorly understood and has shown severe allergic reactions in some individuals. Many people prefer chamomile tea to oolong, green or black tea as they contain caffeine, which can intensify feelings of sleeplessness and anxiety that may already be heightened among eczema sufferers. Conversely, the benefits of oolong tea had been reported in Japan without implications to date and improvements in eczema of those who participated were

seen as early as 2 weeks. Overall, there is sparse research in this area.

Much discourse in the area of cleansing the body through diet surrounds the treatment of eczema. Depending on the age of the person with eczema cleansing diets such as eating only fruit for a period of time is recommended to 'cleanse' the body of toxins and restore homeostasis. Furthermore, the use of enemas for the same purpose is thought to cleanse the bowels of any matter which may produce a toxic effect leading to an eczema break-out. Similarly, taking wheatgrass juice clears the blood of particular toxins and improves the alkalinity of the blood. The opposing condition, acidity in the body is not only thought to predispose the body to certain eczema symptoms but is associated with a host of poor health outcomes. Finally, wheatgrass is also known to contain vital enzymes that assist in optimal functioning of the immune system. It is quite feasible that as more and more research focuses on diet and food allergies, the connection between what we ingest and skin disorders will become evident and many people have already found success in adhering to cleansing regimes and identifying foods that both hinder and assist in managing their eczema.

Other natural topical approaches include: hydrotherapy; hot mud, chickweed and sand baths; calendula, wild pansy, jewelweed and witch hazel applications; benzoin, geranium and hyssop oils and Dead Sea bathing salts. Particularly interesting is the long-term decline in sensitivity some people experience with the use of the Dead Sea salt bathing. The DMZ Clinic at the Dead Sea provided climatotherapy and of the patient population at the clinic, approximately 21% have eczema. Encouragingly, a recent study done at the clinic showed that 95% of both adults and children who attended the clinic for climatotherapy for a minimum of 4 weeks had dramatic improvements. Additionally, since there are no medications thus no side-effects along with a successful treatment outcome, Dead Sea climatotherapy is deemed a highly effective treatment (53)

Chinese medicine has shown very promising in treating eczema and often in very stubborn and difficult cases to treat using conventional approaches. Commonly, a tea is prepared for the patient and tailored specifically to meet their needs. Usually this would contain

approximately 10 different Chinese herbs. All the elements used are listed in the Chinese pharmacopoeia and considered within the accepted practice of Chinese medicine. The elements work by affecting the immune response, providing anti-inflammatory properties along with a sedative effect. Of the studies completed that examined the benefits of Chinese medicine, many have shown a decrease in eczema symptoms and flare-ups. Treatments were found to be temporary lasting on average for 12 months and patients also often relapsed after discontinuing the approach. Importantly, the issues of toxicity, such as liver and kidney problems were identified. Recommendations out of the UK suggest that the use of Chinese medicine may have a place, especially among cases of severe eczema where all other forms of treatment are unsuccessful but in all cases, anyone undergoing Chinese medical treatment should seek medical supervision from both a trained Chinese medicine doctor in conjunction with their primary care provider.

The amount of information can prove overwhelming in this area. Understandably the longer an individual has suffered with eczema or a parent has endured their child's suffering, the more appealing alternative methods may become. And, it is possible that some element of natural and herbal remedies will work, likely as part of a holistic treatment plan. However, it is imperative that the use of such therapies be in consultation with a health care provider and under the supervision of a trained caregiver as serious even life-threatening side effects can and do happen. Moreover, the added emotional and financial stress of constantly searching for a cure, often without positive outcomes may be further detrimental rather than providing beneficial outcome for managing and treating eczema.

4.0 DISCUSSION: SUPPORTING ECZEMA RESEARCH AND ACTIVITIES

4.1 Introduction

The preceding section of the report was provided to provide context on particular research activities, important aspects of the etiology of treatment of childhood eczema and to give a holistic understanding of the disease from various perspectives. This section of the report

will present a discussion aimed at incorporating findings of the environmental scan, information derived through the key informant interviews and other relevant knowledge.

4.2 Areas of focus

Funding for research globally comes from a variety of organizations such as Government departments, specific academic research centres, non-profit organizations, and industry such as pharmaceutical biotechnical. Research initiatives globally regarding eczema and allergies has had a cellular and molecular focus. Current research initiatives into eczema as reported by the National Institute of Health in the US are in: biochemical processes surrounding white blood cells, immunology, treatment options such as light therapy and drug research along with investigations in *Staphylococcus aureus*, a bacterium common in skin infections secondary to eczema (see Appendix I: 'Snapshot of Global Funding Initiatives' for an in-depth summary of projects globally).

There is consensus in the literature and among clinicians and researchers that available funding for eczema is under-resourced compared to other chronic diseases and even within atopic conditions "... [t]here is also an imbalance of funding for research into allergic conditions...asthma tends to receive the majority of research funding, whereas Professor Gawkrödger, in the UK, noted that "there is insufficient research on the subject of eczema and atopic dermatitis" (47;48;54). A document titled: Overview of Food Allergy Funding: from the National Institute of Health stated research into food allergies is allocated approximately 7 million dollars per year out of a total annual budget of 28 million.

A difficult barrier concerning research in the area of childhood eczema is the lack of a clear, collectively understood definition of atopic dermatitis. Our key informant, Dr. B. Krafchic emphasized this point and stated it was imperative that researchers and clinicians, who are experts in this field must work together to develop a comprehensive definition for use in the area of research. Without at best a working definition, the research completed is difficult to replicated, understand, translate and compare – very important issues in research methodology in terms of making progress regardless of either the findings or specific focus of individual studies.

4.3 Funding Priorities

Areas identified in the literature as priorities include immunology characteristics and processes to uncover which allergen exposure, especially in early life correlates with allergy development. In addition, an emphasis on developing individualized treatments is paramount in effectively managing such a complex disease. Other important aspects to consider are issues surrounding the daily living of children with eczema such as the quality of life, environmental triggers and food labeling and patient/health care professional education (47;48;54).

Specific recommendations from the environmental scan for areas to focus in the area of childhood eczema include: the environment and clinical management of the disease, specifically in the sub-areas of food sensitization and both clinical and patient education. These recommendations are chosen based on the severity of impact each has on the child suffering with eczema and importantly their parents. Furthermore, support is recommended for research aimed at investigating various aspects of food sensitization and the clinical management of childhood eczema provide opportunity to significantly reduce the morbidity thus, improve the quality of life for patients and families.

Environmental factors are now hypothesized as the leading culprit in the increasing prevalence of eczema. As previously discussed there is an important role in understanding and considering the impact of genetic mutations and predisposition. One's genetic make-up is set from birth thus; knowing the role of genetics may allow for vigilance against developing eczema and is an important factor in an individual's health literacy. The literature has demonstrated that knowledge surrounding genetic predispositions to eczema have in fact existed for quite some time; however, a possible and probable explanation for the rate of increase in eczema cannot be explained through genetic factors alone and is likely attributable to environmental exposures to various elements.

Moreover a genetic predisposition is not sufficient to cause eczema; therefore, work into what triggers those who are susceptible is important. Of the triggers discussed, food sensitivity

for children is the most prevalent and serious allergen. Research into the mechanisms and understand the reactions from an immunological perspective are crucial in the area of atopic disease and specifically eczema. The possibility of severe sensitization such as anaphylactic reactions, the global exposure to food and food items in the day to day environment, especially for young children and the existence of risk without ingesting food allergens all represent a serious and necessary area to emphasize in atopic disease. Hence initiatives such as the work being done in the area of food labeling are crucial to the well-being for millions of people.

An extremely vital aspect to quality of care for children with eczema is pertinent information on the complexity and seriousness of this skin disease and subsequent problems that may arise. Paramount is support, guidance and information in how childhood eczema affects both the child's and family's quality of life on a day to day basis (40;48;55). Throughout the environmental scan and during the key informant interviews, the need of improved education for clinicians, especially primary care providers and pediatricians along with patient and caregiver education was continually emphasized. Given the knowledge regarding the severe psychological impact childhood eczema has on the patient and their family, improved clinical management derived through education is extremely important. Eczema is a complex disease for clinicians to diagnose properly and manage effectively. Furthermore, parents require a high level of health literacy to remain informed and confident about taking care of their child and remaining an effective health advocate for their child. Support and information from organizations such as the Food Allergy and Anaphylaxis Network, who provide education, support, programming and research, are invaluable resources to patients, parents and clinicians.

Patient education at pre/post natal time is extremely important, the education of women who are atopic or who have known atopic risk in the family (both parents) and providing counseling and information surrounding the risk of atopic disease to their child is an opportunity to reduce the onset and severity of future cases of childhood eczema. Research is now beginning to uncover the links among genetic predisposition, maternal-fetus risk and the prophylactic process that may eliminate or lessen atopic disease in children and reduce the incidence of IgE associated eczema. If prenatal risk (or even before pregnancy) education is instituted within primary care practice as a public health primary prevention initiative, the possible impact for

reduced cases and severity of disease is very promising.

Once a child is presenting to the clinician with symptoms of atopic disease, health care providers must know what to do to intervene quickly, render an accurate diagnosis and begin effective treatment. Over the long term, it is imperative clinicians understand the relationship among eczema, allergies (including food sensitizations) and the risk of developing co-morbidities such as asthma, which again significantly impacts the child's quality of life and can become life threatening. The emphasis of early effective clinical management cannot be overstated. Each of the key informants emphasized further education to both primary care physicians and pediatricians; a translation of the academic and research findings to front-line health care services to improve their clinical knowledge surrounding the diagnosing and treatment of atopic disease. Furthermore, there is a need for a global diagnostic tool and clear clinical guidelines for treatment protocols that require further research and transdisciplinary collaboration among health care professionals and researchers dedicated to the area of childhood eczema. Finally concerning treatment, Dr. Krafchic emphasized the need to re-educate clinicians and patients on the use of steroid treatment. She explained the wealth of misinformation associated with negative connotations of using topical steroids and the need for clinicians and patients to understand the safe and very effective use of this treatment option. Furthermore, the avoidance of using this treatment in some specific cases dramatically and unnecessarily increases the patient's suffering, which she feels is irresponsible to the patients who need aggressive treatment in order to avoid serious morbidity issues.

Although paramount, the focus on the physical aspects of this disease cannot trump the psychosocial issues that may be unaddressed; health professionals require further information to increase their understanding of the social context and burden of illness shared by entire family. In order to realize these improvements in understanding the immunological processes surrounding environmental triggers and institute improved clinical management financial resources and advocacy are required in the areas of food sensitization and clinical and public/patient education.

5.0 CONCLUSION

The take home message is that a priority and emphasis must be placed on reducing the morbidity and the burden of illness so many children and their families face each day living with childhood eczema. Research discoveries take time and excellent progress is underway in the area of atopic disease, a further understanding and awareness of food sensitization and other environmental triggers will improve patient care and the management of disease. Additionally, resources devoted to improving understanding of eczema, allowing parents and health care providers work in tandem to manage a child's eczema and increased health literacy to mothers and parents alike will empower them to effectively reduce and manage their child's disease.

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APPENDIX B
SEARCH STRATEGY: KEYWORD SUMMARY

PRIMARY KEYWORDS	SECONDARY KEY WORDS	TERTIARY KEYWORDS	QUATERNARY KEYWORDS
ECZEMA	ATOPIC DERMATITIS	Dyshidrotic eczema (pompholyx)	Neurodermatitis
		Seborrheic dermatitis	Allergic Contact Contact
		Perioral-nasal-ocular dermatitis	
		Discoid eczema	
Childhood	Child		
	Pediatric		
	Preschool		
	Infant		
	Etiology		
	Epidemiology	Prevalence	
	Diagnosis		
	Co-Morbidity	Asthma	
		Staphylococcus aureus	
		Fungal	
	Treatment	Therapy	
		Therapeutic	
		Pharmacology	Drugs
			Drug Therapy
			Antibiotics
		Steroids	Glucocorticoids
			Cortisone
		Corticosteroids	
		Phototherapies	
		Cycloporine	
		Calcineuin Inhibitors	Pimecrolimus cream
			Tacrolimus Ointment
		Behaviour Modification	
		Interferon Gamma	
		Mycophenolate Mofetil	
		Non-Prescription	Coal Tar
			Emulsions
			Emolients
			Moisturizers/Cleansers
			Antihistamines
			Compress
			Acetaminophen
			Climatotherapy
PRIMARY KEY WORDS	SECONDARY KEY WORDS	TERTIARY KEY WORDS	QUATERNARY KEY WORDS

	Treatment con't	Primary Health Care	Case Management
			Plan of Care
			Written Plan of Care
	Alternative Therapy	Homeopathy	
		Dietary Supplements	Herbs
			Teas
			Pre/Probiotics
		Chinese Medicine	
	Allergies	Household	
	Allergy	Seasonal/Season	
		Environmental	Pollen
		Food	
		Animal	Cats, Dogs, Birds
		Mites	Dust, Mold
	Environmental	Air Pollution	Air Quality
		Climate	
		Temperature	
		Urban/Rural	
	Genetics	Linkage	
	Genes	Familial	
	Diet	Food	
		Probiotics	
	Sociodemographics	Socioeconomic Status	
		Housing	
	Psychosocial	Stress	
		Quality of Life	
		Illness Perception	
	Health Promotion	Patient Education	
	Caregivers	Parent	Parental
			Social Networks

APPENDIX C

ORGANIZATIONS AND ELECTRONIC REFERENCES: Information and Blogs

CANADA

Eczema Canada

The Canadian Dermatology Association (www.eczemaCanada.ca/en/home.php)

Eczema Daily Care (www.dermatology.ca/)

The Eczema Society of Canada (www.eczemadailyCare.ca/en/index.php)

Canadian Dermatology Foundation/ Hospital for Sick Children funding (www.cdf.ca)

The Eczema Society of Canada (www.eczemaHelp.ca)

Skin Patient Alliance (www.skinPatientAlliance.ca)

Health Canada (www.hc-sc.gc.ca/index-eng.php)

UNITED STATES

The American Academy of Dermatology (www.aad.org/)

American Society of Dermatology Surgeons (www.asds.net/)

National Eczema Association for Science and Education (www.nationaleczema.org)

University of Kansas Medical Center (www.kumc.edu/)

American Society of Photobiology (www.pol-us.net/ASP_Home/search.html)

Dermatology Nurse's Association (www.dnanurse.org/)

National Eczema Association for Science and Education (www.nationaleczema.org)

Nemours (www.nemours.org)

EczemaNet (www.skincarePhysicians.com/eczemanet/index.html)

Children's Skin Disease Foundation (www.csdF.org/)

National Jewish Health (www.nationalJewish.org/index.aspx)

American Academy of Pediatrics (www.pediatrics.aapublications.org/)

MedlinePlus Service of the U.S. National Library of Medicine and the NIH (www.medlineplus.gov/)

National Institute of Arthritis and Musculoskeletal and Skin Diseases (www.niams.nih.gov/)

The National Conference of State Legislatures (www.ncsl.org/programs/environ/envhealth/CHILDH.htm)

National Children's Study (www.nationalChildrensStudy.gov/Pages/search.aspx?q=eczema)

National Institute of Environmental Health Sciences (www.niehs.nih.gov/index.cfm)

American Osteopathic College of Dermatology (www.aocd.org/skin/dermatologic_diseases/index.html)

Allergy & Asthma Network Mothers of Asthmatics (www.breatherville.org/breatherville.htm)

UNITED KINGDOM

National Eczema Society (www.eczema.org)

British Skin Foundation (www.britishSkinFoundation.org.uk)

British Society for Pediatric Dermatology (www.bsPD.org)

Eczema Voice (www.eczemaVoice.com)

Nottingham Support Group for Carers of Children With Eczema (www.nottinghameczema.org.uk)

Talk Eczema (www.talkeczema.com)

Eczema Mailing list (www.eczema.ndo.co.uk/index.htm)

Irish Health – eczema (www.irishHealth.com/eczema)

Irish Eczema Society Ireland (www.eczemaIreland.org)

Softened Water Eczema Trial (www.swet-trial.co.uk)

The University of Nottingham (www.nottingham.ac.uk/dermatology/3research.htm)

AUSTRALIA

Australian Institute of Health and Welfare (AIHW) (www.aihw.gov.au)

Australian Society of Clinical Immunology and Allergy Inc (www.allergy.org.au)

Dermnet New Zealand (www.dermnetnz.org)

Eczema Association of Australasia ('Eczema Survival Guide') (www.eczema.org.au)
Health Insite (www.healthinsite.gov.au/topics/Eczema)
The Telethon Institute for Child Health Research (www.ichr.uwa.edu.au)
The Australian Research Alliance for Children and Youth (ARACY) (www.aracy.org.au)
National Centre for Epidemiology and Population Health (www.nceph.anu.edu.au)
Australian International Health Institute (AIHI) (www.aihi.unimelb.edu.au)
Murdoch Children's Research Institute (www.mcri.edu.au)

EUROPE

University of Heidelberg (DE) (www.eczema.dermis.net/content/index_eng.html)
The European Academy of Allergy and Clinical Immunology Organization (www.eaaci.net/site/homepage.php)
European Society for Dermatological Research (SZ) (www.esdr.org/index.php?option=com_frontpage&Itemid=1)
Association of psoriasis and eczema patients in Iceland (IS) (www.psoriasis.is)
World Allergy Organization (DE) (www.worldallergy.org)

MALAYSIA

Eczema Malaysia (www.eczema.webs.com)
Hospital Kuala Lumpur Department of Dermatology (www.hkl.gov.my/content/deptintro.php)

INFORMATION AND BLOGS

Eczema Blog (www.eczemablog.blogspot.com)
Eczemaletters (www.eczemaletters.com)
Allergy Show (UK) June 12-14 2009 Seminars on Eczema/Sensitive Skin (www.allergyshow.co.uk)
Dr Greene Blog (US) (blogs.drgreene.com)
American Chronicle (US) (www.americanchronicle.com)
SAWF NEWS (news.sawf.org/Health)
Newscientist Health (www.newscientist.com)
Irishhealth.com (IE) (www.irishhealth.com)
Nutraingredients-usa.com (FR) (www.nutraingredients-usa.com)
Jamaica Gleaner Newspaper - Cerasee cured my eczema (JM) (www.jamaica-gleaner.com)
Wired Magazine MED-TECH Health (www.wired.com)
Telegraph News (UK) (www.telegraph.co.uk)
BBC (UK) (www.bbc.co.uk)
Reuters UK News (uk.reuters.com)
Brookline Tab News USA (www.wickedlocal.com/brookline/homepage)
The Scotsman Evening News (www.scotsman.com)
Scribd- 30 Daily Eczema Diet Tips (www.scribd.com)
The Daily (AU) (www.thedaily.com.au)
WebMD (www.webmd.com)
Our-eczema BLOG (UK) (www.our-eczema.com)
Atopiceczema BLOG (atopiceczema.wordpress.com)
Eczemablog (eczemablog.wordpress.com)
Eczemaclub (eczemaclub.blogspot.com)
Daily Mail (UK) (www.dailymail.co.uk)
WILEY interscience (www3.interscience.wiley.com)
Celiac.com (www.celiac.com/gluten-free)
Couriermail.com.au (www.news.com.au/couriermail)
American Family Physician (www.aafp.org/afp/20030415/clinical.html)
Independent News and Media (www.independent.ie)
Redorbit.com (www.redorbit.com)
Reuters.com (www.reuters.com/article/healthNews/idUSCOL86984820080528)
Timesonline.com (www.timesonline.co.uk)

The NY Times (US) (health.nytimes.com/ref/health/healthguide/esn-eczema-ess.html)
Wikipedia (en.wikipedia.org/wiki/Tacrolimus)
Eating Fabulous - BLOG part of Health and Wellness Channel (www.eatingfabulous.com)
The Sydney Morning Herald (AU) (www.smh.com.au)
Science Daily (www.sciencedaily.com/releases/2008/07/080706194255.htm)
Diary of an Eczema Sufferer BLOG (skinurghs.blogspot.com)
Under My Skin Children's book (www.undermyskin.com)
The Korea Times (KR) (www.koreatimes.co.kr)
Newscientist (www.newscientist.com)
Washington Post (US) (www.washingtonpost.com)
Allergy an Clinical Immunology (Lippincott Williams & Wilkins) (www.co-allergy.com)
Modern Medicine (www.modernmedicine.com)
3NEWS (NZ) (www.3news.co.nz/Home/tabid/183)
Solve Eczema Blog (www.solveeczema.org)
WAtoday (AU) (www.watoday.com.au)
Children's Hospital Medical Center of Cincinnati's Skin Sciences Institute (www.cincinnatichildrens.org)
The Globe and Mail (CA) (www.theglobeandmail.com)
U.S.News (www.usnews.com)
Eczema Natural Treatment (www.eczemaskintreatment.com)
Hubpages (www.hubpages.com/search/eczema)
6minutes.com.au (www.6minutes.com.au)
Leap Study (UK) (www.leapstudy.co.uk)
14wfie.com (www.14wfie.com)
BMJ medical publication of the year (www.bmj.com/cgi/eletters/324/7350/1376#22854)
Vitality Magazine - Toronto's monthly wellness journal (CA) (www.vitalitymagazine.com)
Interscience Wiley (www3.interscience.wiley.com)
European Respiratory Journal (EU) (www.erj.ersjournals.com/cgi/content/full/29/6/1169)
USA TODAY (www.usatoday.com)
Robert Helmer The Children's Clinic (CA) (www.roberthelmer.ca/eczema.html)
HealthDay (www.healthday.com/Article.asp?AID=621168)
Archives of Dermatology (archderm.ama-assn.org)
Itchy kids (NZ) (www.itchykids.org.nz)
Center Watch Studies and clinical trials (search.centerwatch.com)
ECZEMA.NET Christine Nevada Naturopathic eczema researcher (www.eczema.net)
Internet health library (www.internethealthlibrary.com)
The Cochrane Collaboration (www.cochrane.org)
Science Links (JP) (www.sciencelinks.jp)
Ingenta Connect - Pediatric Allergy and Immunology (www.ingentaconnect.com)
Cure Hunter Precision Medical Data Mining (www.curehunter.com)
Springer link (www.springerlink.com)
The Journal of Allergy and Clinical Immunology (www.jacionline.org)
PubMed (www.ncbi.nlm.nih.gov/pubmed)
Biomedicine (www.bio-medicine.org)
The Agency for Toxic Substances and Disease (US) (www.atsdr.cdc.gov)
Medicalnewstoday.com (www.medicalnewstoday.com/articles/95817.php)
ISAAC, the International Study of Asthma and Allergies in Childhood (NZ) (isaac.auckland.ac.nz)
Allergy.immunodefence.com (allergy.immunodefence.com)
Femail.com.au (AU) (www.femail.com.au)
Holistic Dermatology (www.holisticdermatology.com)
University of Melbourne Blogs (AU) (blogs.unimelb.edu.au)
University of Melbourne NEWS (AU) (uninews.unimelb.edu.au)
Resource List (www.eczemainformant.com)

Allergy & Asthma Network Mothers of Asthmatics (US) (www.aanma.org/publications)
MD(e) MedIndia Networking for Health (IN) (www.medindia.net)

PRODUCTS

Skin MD Natural™ Lotion (www.skinmdnatural.com)
Derma Silk (UK) clothing (www.dermasilk.co.uk)
Emily Skin Soothers (all natural) (US) (www.emilyskinsoothers.com)
Drwheatgrass.com (www.drwheatgrass.com)
Synergyhealth (www.synergyhealthplc.com)
Skin scientifica (www.skinscientifica.com/SkinScientifica/Home.asp)
Ellen Jay Health and Beauty Ltd (AU) (www.ellenjay.com.au)
Cotton Comfort (www.eczemaclotting.com)
Pharmaceutical Specialties Inc. (US) (www.psico.com)
Eczema Solution (www.eczemasolution.com)

APPENDIX E

KEY INFORMANT INTERVIEW GUIDE

GOALS OF THE KEY INFORMANT INTERVIEWS	
I.	To elicit expert opinions regarding research priorities in the area of eczema and specifically childhood eczema
II.	To elicit expert opinions regarding resources required in the area of childhood eczema
III.	To elicit expert opinions on where financial resources are best suited in the area of childhood eczema
IV.	To expand the social network of contacts in the area of eczema and specifically childhood eczema

SPECIFIC QUESTIONS ASKED OF INDIVIDUALS	
1	[Where appropriate] How long have you been involved in the area of childhood eczema? or how long has the organization been involved in eczema activities? (in some cases this is self evident)
2a.	In Your Expert Opinion, What do you feel are important research areas to consider at this time regarding eczema?
2b.	Again focusing on research areas, what do you feel is specifically a priority at this time for children?
3a.	When thinking about childhood eczema, what do you feel are important areas that are currently under-resourced?
3b.	Of the areas you identified as under-resourced, which do you personally feel is a priority? Please explain why?
4	In Your Expert Opinion, do you feel there are particular areas that are not prudent to fund at this time? If so, can you explain why? [Perhaps some areas are adequately resourced?]
5	Do you have an opinion on any areas that have sufficient resources at this time thus areas that would be a good choice to shy away from allowing our resources to be directed elsewhere?
6	Do you feel it would be important to make contact with any other researchers or colleagues you have in this area to find out more about what the priorities are in childhood eczema or to better understand where resources are needed?
7	Is there any other information you feel would be important for us to consider in the area of childhood eczema when setting up an endowment fund at this time?

KEY INFORMANT INTERVIEW GUIDE CONTINUED

	SPECIFIC QUESTIONS ASKED FOR ORGANIZATIONS
1	How long has your organization been involved in the area of Childhood Eczema?
2	How would you identify your primary audience (e.g., patients, caregivers etc?)
3	Can you specify the types of programs you have been involved with concerning childhood eczema? Perhaps you have an organizational document that could provide this information?
4	Do you have impact measures for how successful your programs were or how they meet their intended targets?
5	Does your organization routinely complete evaluations of programs/research conducted?
6	Do your programs/activities pertaining to childhood eczema receive core funding? If so, who are your major funding agencies/sources?
7	Do your programs/activities pertaining to childhood eczema receive grant funding? If so, who are your major grant funding agencies/sources?
8	Are you able to provide access to an E-copy or hard copy of your organization's annual report?
9	What other information do you feel is important for my client to know about your organization surrounding your work in the area of childhood eczema?

APPENDIX F

TYPES OF ATOPIC DERMATITIS

Type of Atopic Dermatitis	Brief Description/Characteristics
Atopic Eczema	Chronic skin disease Itchy, red, irritated skin
Dyshidrotic eczema (pompholyx)	Term is used to describe either a specific disease or a pattern of presentation Hand are most affected Most often appears on sides of both toes and fingers Characterized with blisters Commonly associated with extreme itch
Seborrheic dermatitis	Presentation affected by where it appears on the body On scalp area will be red and most often scaly When on remainder of the body appears moist
Perioral-nasal-ocular dermatitis	Only presents around the mouth, nose and eyes Very often thought to be Rosacea
Discoid eczema	Characteristic: coin shaped (1-3cm) appearance Also known as nummular Can appear anywhere on the body Has both moist (weeping) and dry, scaly characteristics Severe itching often present
Neurodermatitis	Characterized by scaly patches Often occurs on head, lowers legs, forearms and wrists Initiated by a localized itch such as a bite
Allergic Contact Eczema	Skin is exposed to irritant through contact Red, weepy and itchy Immune system recognizes something is foreign e.g., poison ivy
Contact Eczema	Occurs when skin is exposed to an allergen or irritant e.g., chemical, cleaning product(s) Localized to one specific location Red, itchy and burning skin

APPENDIX G

ENVIRONMENTAL TRIGGERS

- a. Food Allergies
- b. Pollen
- c. Mold
- d. Dust/Fine Dust
- e. Dust Mites
- f. Pet Dander
- g. Grasses
- h. Plant Pollen
- i. Particular Fabrics (e.g., wool)
- j. Various Personal Hygiene Products (e.g., products with alcohol)
- k. Air Quality (Low Humidity, Ground level ozone, nitrogen dioxide etc.)
- l. Excessive Heat in the Environment
- m. Air Conditioning
- n. Personal emotional stress
- o. Tobacco Smoke
- p. Sweating
- q. Dry Skin
- r. Numerous household and environmental chemicals (e.g., laundry detergents, cosmetics)

APPENDIX H

COMMON TREATMENTS FOR ECZEMA

PRESCRIPTION MEDICATION

Steroid Topical Applications (includes cortisone creams)

Steroid-free Topical Applications (used for skin barrier repair)

Calcineurin Inhibitors-Topical Application (Pimecrolimus cream, Tacrolimus Ointment)

Antibiotics

Corticosteroids

Phototherapies (exposure to ultraviolet light)

Cycloporine (only prescribed in most severe cases)

Behaviour Modification (avoiding scratching and increasing health literacy regarding moisturizers, medication adherence)

Interferon Gamma (injections to stimulate immune system)

Mycophenolate Mofetil (only in most severe cases, suppresses the immune system)

NON-PRESCRIPTION MEDICATION

Coal Tar Applications (various preparations)

Skin moisturizers/Emollients (with ceramide)

Antihistamines

Application of Cool Compresses

Dietary Supplements, Herbs and Teas (e.g., evening primrose oil, probiotics, VitB6 and Chinese Herbal Medicine)

APPENDIX I

SNAPSHOT OF GLOBAL FUNDING INITIATIVES

GRANT INFORMATION (~ 6 years where available)

Date	Geographical Area	Organization (Received)	Area of Interest	Grant Agency/Amount	Investigator
CANADA					
Canadian Institutes of Health Research					
2007-09	ON	McMaster University	Canadian Birth Cohort: Indoor air and the development of asthma and allergy	2007-08 \$872,000 2008-09 \$1,300,000	Sears, Malcolm Raymond
2007-09	QC	McGill University	Statistical methods for causal inference in longitudinal studies with non-compliance and missing data	2007-08 \$21,448 2008-09 \$85,794	Moodie, Erica Eleanor Margret
2007-09	BC	University of British Columbia	CIHR skin research training centre	2007-08 \$300,000 2008-09 \$300,000	Dutz, Jan Peter ; Esdaile, John Margrave ; Ghahary, Aziz ; Larjava, Hannu Sakari ; Li, Gang ; Lui, Harvey ; Shapiro, Jerry ; Zhou, Youwen
2006-09	BC	The Child & Family Research Institute	Tolerance induction by transcutaneous immunization through calcipotriol treated skin	2006-07 \$50,852 2007-08 \$101,702 2008-09 \$101,702	Dutz, Jan Peter
2006-09	ON	University of Waterloo	Design and development of targeted gene delivery systems	2006-07 \$75,000 2007-08 \$300,000 2008-09 \$300,000	Foldvari, Marianna ; Grochulski, Pawel ; Haas, Thomas A. ; Hull, Peter Robin ; Nazarali, Adil J.
2004-08	MB	University of Manitoba	Active anti-igE and -th2 cytokine strategy in downregulation of allergic responses	2004-05 \$49,680 2005-06 \$99,360 2006-07 \$15,818 2007-08 \$133,222	Peng, Zhikang

Date	Geographical Area	Organization (Received)	Area of Interest	Grant Agency/Amount	Investigator
CANADA					
Canadian Institutes of Health Research					
2003-08	QC	Université de Montréal	Asthma during pregnancy and the incidence of asthma in the offspring	2003-04 \$32,390 2004-05 \$7,568 2005-06 \$66,987 2006-07 \$70,025 2007-08 \$23,800	Blais, Lucie ; Martel, Marie-Josée
2003-07	MB	University of Manitoba	The causal relationship between infection and allergic disease	2003-04 \$30,000 2004-05 \$35,000 2005-06 \$35,000 2006-07 \$5,000	Bilenki, Laura Cari-Ann
2003-06	BC	B.C. Research Institute for Children's & Women's Health (Vancouver)	Tolerance induction by skin immunization	2003-04 \$24,982 2004-05 \$59,956 2005-06 \$34,974	Dutz, Jan Peter
UNITED STATES					
2008	ID	Indiana University-Purdue University	Stat6 in Atopic Dermatitis	\$256,834	Kaplan, Mark
2008	MD	Johns Hopkins University	IL-13 Atopic Dermatitis and Its Relationship with the Development of Asthma	\$410,000	Zheng, Tao
National Institute of Health (2003 - 2009)					
2008	MA	Children's Hospital Corporation	Immunologic mechanisms of atopic dermatitis	\$356,083	Raif S Geha
2008	OH	Children's Hospital Medical Center	Role of il-13 receptors in atopic dermatitis	\$316,050	Gurjit K Khurana Hershey
2008	ID	Indiana University	Airway as target organ in infants with atopic dermatitis	\$330,661	Robert S Tepper
2008	ID	Indiana University	Pathogenesis of atopic dermatitis	\$955,752	Mark H Kaplan
2008	CA	Northern California Institute For Research & Education	Risk factors for eczema vaccinatum in atopic dermatitis	\$383,693	Walter M Holleran
2008	WA	Syntrix Biochip Inc	Aminopterin for the treatment of severe recalcitrant atopic dermatitis	\$293,574	Stuart J Kahn

Date	Geographical Area	Organization (Received)	Area of Interest	Grant Agency/Amount	Investigator
UNITED STATES					
National Institute of Health (2003 - 2009)					
2008	CA	Northern California Institute For Research & Education	Risk factors for eczema vaccinatum in atopic dermatitis	\$383,693	Walter M Holleran
2008	MA	Children's Hospital Boston	Role of WASP/WIP Complex in T Cell Function	Funding not disclosed	Geha, Raif
2008	OH	Children's Hospital Med Ctr	Interleukin-9 in experimental intestinal anaphylaxis	Funding not disclosed	Hogan, Simon
2008	NC	University Of North Carolina Chapel Hill	Community Participation Research of Breastfeeding Disparities in African American	Funding not disclosed	Ringel-Kulka, Tamar
2007-08	OR	Siga Technologies, Inc.	ST-246 treatment of smallpox vaccine-related adverse events in murine models	Funding not disclosed	Grosenbach, Douglas
2006-08	MD	Johns Hopkins University	Efficacy of ige in Mediating Allergic Reactions in Vivo	Funding not disclosed	Macglashan, Donald
2006-08	VA	Virginia Commonwealth University	Sphingosine-1-Phosphate, A Novel Mediator of Human Skin Mass Cell Functions	Funding not disclosed	Oskeritzian, Carole
2006-08	CT	Yale University	Th2 responses in the cutaneous environment	Funding not disclosed	Herrick, Christina
2005-08	NC	Wake Forest University Health Sciences	The Wake Forest and Harvard Center for Botanical Lipids	Funding not disclosed	Chilton, Floyd
2005-08	MI	Michigan State University	Genetic & epidemiologic cohort study of asthma & allergy	Funding not disclosed	Ewart, Susan
2005-08	MA	Brigham And Women's Hospital	Gene by Environment Interactions in Asthma and Allergy	Funding not disclosed	Litonjua, Augusto
2005-08	NY	Mount Sinai School Of Medicine Of Nyu	Immune Mechanisms-- Observational Study of Food Allergy	Funding not disclosed	Sicherer, Scott

Date	Geographical Area	Organization (Received)	Area of Interest	Grant Agency/Amount	Investigator
UNITED STATES					
National Institute of Health (2003 - 2009)					
2004-08	MA	Brigham And Women's Hospital	The Epidemiology of Home Allergens and Asthma	Funding not disclosed	Gold, Diane
2004-08	TN	St. Jude Children's Research Hospital	Gene Therapy for the Wiskott Aldrich Syndrome	Funding not disclosed	Strom, Ted
2007	CA	Northern California Institute For Research & Education	Risk factors for eczema vaccinatum in atopic dermatitis	\$391,124	Walter M Holleran
2007	MA	Children's Hospital Corporation	Immunologic mechanisms of atopic dermatitis	\$359,216	Raif S Geha
2007	OH	Children`s Hospital Medical Center	Role of il-13 receptors in atopic dermatitis	\$322,500	Gurjit K Khurana Hershey
2007	ID	Indiana University	Airway as target organ in infants with atopic dermatitis	\$270,035	Robert S Tepper
2007	ID	Indiana University	Pathogenesis of atopic dermatitis	\$949,351	Mark H Kaplan
2007	CA	Northern California Institute For Research & Education	Risk factors for eczema vaccinatum in atopic dermatitis	\$391,124	Walter M Holleran
2007	GA	Emory University	Pox Virus Immunology and Vaccine Development	Funding not disclosed	Ahmed, Rafi
2007	GA	Emory University	Poxvirus Immunity and DNA/MVA HIV Vaccines	Funding not disclosed	Amara, Rama Rao
2006-07	CA	Experimed Bioscience, Inc.	Multiplexed single cell cytokine secretion assay	Funding not disclosed	Kauvar, Lawrence
2006	MD	Division Of Cancer Epidemiology And Genetics	Epidemiology and Natural History of Cancer-Associated Vi	Funding not disclosed	Goedert, James
2006	TX	Biomedical Development Corporation	Novel topical treatment of eczema	\$134,645	Bakul M Bhatt
2006	CA	Northern California Institute For Research & Education	Risk factors for eczema vaccinatum in atopic dermatitis	\$402,806	Peter M Elias
2006	ID	Indiana University	Airway as target organ in infants with atopic dermatitis	\$271,944	Robert S Tepper
2006	ID	Indiana University	Pathogenesis of atopic dermatitis	\$991,391	Mark H Kaplan

Date	Geographical Area	Organization (Received)	Area of Interest	Grant Agency/Amount	Investigator
UNITED STATES					
National Institute of Health (2003 - 2009)					
2006	ID	Indiana University	Airway as target organ in infants with atopic dermatitis	\$271,944	Robert S Tepper
2006	ID	Indiana University	Pathogenesis of atopic dermatitis	\$991,391	Mark H Kaplan
2006	MD	National Human Genome Research Institute	Transcriptional Regulation of Epidermal Differentiation	Funding not disclosed	Segre, Julie
2005-06	MA	Immune Disease Institute, Inc.	Defects of Thymic Output in Wiskott-Aldrich Syndrome	Funding not disclosed	Remold-O'donnell, Eileen
2004-06	WI	University Of Wisconsin	Anxiety and Inflammatory Correlates in Youth with Eczema	Funding not disclosed	Slattery, Marcia
2003-06	CA	Burnham Institute For Medical Research	Roles of the WASP N-terminus in hematopoietic cells	Funding not disclosed	Tsuboi, Shigeru
2003-06	MD	National Institute Of Allergy And Infectious Diseases	Immune Responses to Vaccinia Virus Vaccination	Funding not disclosed	Cohen, Jeffrey
2005	WI	University Of Wisconsin System/Board Of Regents	Anxiety & inflammatory correlates in youth w/eczema	\$72,750	Marcia J Slattery
2005	CA	Northern California Institute For Research & Education	Risk factors for eczema vaccinatum in atopic dermatitis	\$350,625	Peter M Elias
2005	MA	Children's Hospital Corporation	Immunologic mechanisms of atopic dermatitis	\$352,925	Raif S Geha
2005	ID	Indiana University	Airway as target organ in infants with atopic dermatitis	\$356,498	Robert S Tepper
2005	CA	Northern California Institute For Research & Education	Risk factors for eczema vaccinatum in atopic dermatitis	\$350,625	Peter M Elias
2004-05	NY	Columbia University Health Sciences	Pet Exposure, Allergy and Early Asthma in the Inner-City	Funding not disclosed	Perzanowski, Matthew

Date	Geographical Area	Organization (Received)	Area of Interest	Grant Agency/Amount	Investigator
UNITED STATES					
National Institute of Health (2003 - 2009)					
2004-05	WA	University Of Washington	Intradermal vaccinia:T-cell specificity and skin homing	Funding not disclosed	Koelle, David
2004-05	CO	National Jewish Health	Immunomodulation of vaccinia-induced antimicrobial pept	Funding not disclosed	Leung, Donald
2003-05	AZ	University Of Arizona	Developmental mechanisms of early life eczema	Funding not disclosed	Halonen, Marilyn
2003-05	AZ	University Of Arizona	Score in cellular and molecular mechanisms of asthma	Funding not disclosed	Martinez, Fernando
2003-05	MD	National Human Genome Research Institute	Genetic analysis of host defense disorders	Funding not disclosed	Puck, Jennifer
2004	ID	Indiana University, Bloomington	Airway as target organ in infants with atopic dermatitis	\$361,027	Robert S Tepper
2003-04	OH	Ohio State University	Allergic Condition Biomarkers and Glioma Risk	Funding not disclosed	Schwartzbaum, Judith
2003	MA	Children's Hospital Corporation	Immunologic mechanisms of atopic dermatitis	\$354,206	Raif S Geha
2003	IL	University Of Illinois At Chicago	Characterization of an animal model of atopic dermatitis	\$77,935	Lawrence S Chan
2003	MD	FDA Center For Biologics Evaluation And Research - Hematology	Safety and Efficacy of Immune Globulins	Funding not disclosed	Scott, Dorothy
2003	PR	University Of Puerto Rico Med Sciences	Pre-clinical Studies on Lupinus termis Seeds Extract	Funding not disclosed	Antoun, Mikhail
2003	OH	Case Western Reserve University	Development of a Safer Smallpox Vaccine	Funding not disclosed	Cho, Michael
2003	MA	Beth Israel Deaconess Medical Center	Mechanisms of WASP Function in T Cell Responses	Funding not disclosed	Geha, Raif

Date	Geographical Area	Organization (Received)	Area of Interest	Grant Agency/Amount	Investigator
UNITED STATES					
National Institute of Health (2003 - 2009)					
2003	VA	University Of Virginia	House dust mite antigen on skin of patients with atopic dermatitis	Funding not disclosed	Platts-Mills, Thomas
AUSTRALIA					
NHMRC Funded Research into Eczema (Atopic Dermatitis) 2003-08					
2008	VIC	University of Melbourne	Why eczema increases the severity of virus infections	2008 \$164,590	Dr Francis R Carbone
2006-08	NSW	University of Sydney	Analysis of PHF11, a new gene associated with atopic dermatitis and asthma	2006 \$161,250 2007 \$159,288 2008 \$162,724	Dr Graham J Jones
2005-08	VIC	University of Melbourne	Skin wise: a work place intervention to reduce occupational contact dermatitis in hairdressers	2005 \$11,419 2006 \$21,231 2007 \$20,732 2008 \$16,679	Ms Tessa G Keegel
2007	VIC	University of Melbourne	longitudinal family study investigating risk factors for childhood allergic disorders and their consequences	2007 \$850,000	Dr Shyamali Dharmage
2004-06	NSW	University of New South Wales	New mechanisms involved in the recruitment and activation of cells mediating allergic diseases	2004 \$160,500 2005 \$160,500 2006 \$160,500	Prof Carolyn L GECZY
2003-06	NSW	University of Newcastle	The Psychological sequelae of skin disease in Australian general practice: psoriasis, atopic eczema and acne	2003 \$28,432 2004 \$29,489 2005 \$30,014 2006 \$15,342	Dr Parker J Magin
2003-05	QLD	Queensland Institute of Medical Research	A family study of genes in atopic dermatitis.	2003 \$129,100 2004 \$155,725 2005 \$124,875	Dr David L Duffy
2003-05	WA	University of Western Australia	Immunomodulatory properties of interstitial microflora during early development	2003 \$73,250 2004 \$73,250 2005 \$73,250	A/Pr Susan L Prescott

Date	Geographical Area	Organization (Received)	Area of Interest	Grant Agency/Amount	Investigator
AUSTRALIA					
NHMRC Funded Research into Eczema (Atopic Dermatitis) 2003-08					
2003-05	WA	University of Western Australia	Allergy prevention studies: effects of early postnatal probiotic supplementation on infant immune responses	2003 \$19,659 2004 \$20,484 2005 \$10,447	Ms Angie L Taylor
NEW ZEALAND					
New Zealand Health Research Council					
2006	Lower North Island	Massey University; Professor Jeroen Douwes	Hygiene Hypothesis; Rural versus Urban Living	2006 \$800,000	Prof. Jeroen Douwes
SWEDEN					
National Institute of Health USA					
2003	Stockholm	Karolinska Institute	A Twin Study of Chronic Fatigue Syndrome in Sweden	Funding not disclosed	Pedersen, Nancy