

# Helminthic Therapy in Science and the Media

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## Introduction

This document lists scientific studies and various forms of media coverage relating to [helminthic therapy](#) and closely related topics such as the [Hygiene Hypothesis](#), the [Old Friends' Hypothesis](#), [Biome Depletion Theory](#) and [Evolutionary Mismatch Theory](#).

There are four organisms being used in helminthic therapy:

- \* the pig whipworm, [Trichuris suis](#) (TSO)
- \* the human hookworm, [Necator americanus](#) (NA)
- \* the human whipworm, [Trichuris trichiura](#) (TTO)
- \* the rat tapeworm, [Himenolepis diminuta](#) (HDC)

However, not all of the studies and articles listed below are concerned with these four species. Some have focussed on the effects of other helminths, or molecules derived from them, yet all are valuable for the insights they provide about the effects of helminths generally, and of their excretory/secretory products.

## Searching the list

If you are interested in helminthic therapy in relation to a particular medical condition, use your device's search function to locate the items that are relevant to that disease. Several conditions will require the use of more than one search term, for example:

**Allergies** - search for "allerg", "atopy" and "anaphylaxis"  
**Anemia** - search for "anemia" and "anaemia"  
**Arthritis** - search for "arthritis" and "joint"  
**Asthma** - search for "asthma", "airway" and "wheeze"  
**Autism** - search for "autism" and "ASD"  
**Celiac disease** - search for "celiac" and "coeliac"  
**Crohn's disease** - search for "Crohn's" and "IBD"  
**Diabetes** - search for "diabet" and "insulin"  
**Heart disease** - search for "cardio" and "atherosclerosis"  
**Inflammation** - search for "inflam"  
**Leaky gut** - search for "barrier"  
**Multiple sclerosis** - search for "multiple sclerosis" rather than "MS"  
**Obesity** - search for "obes" and "adipose"  
**Pregnancy** - search for "preg" and "mater"  
**Ulcerative colitis** - search for "colitis" and "IBD"

## Papers and reports

This section contains links to scientific papers and reports about *individual* studies, listed in reverse chronological order. Papers shown in **purple** mark key stages in the development of the Hygiene Hypothesis and the therapeutic use of helminths. Links shown in **red** are a good place to start if you're new to helminthic therapy, or if you're looking for resources that would help someone else to understand this therapy.

Unless otherwise stated, the main links are to **PubMed** abstracts, with additional links to full text copies and PDFs also provided, if available. Where free full text copies are not available via PubMed, these can usually be obtained from other sources such as **Sci-Hub** and the Facebook group, **Get Your Papers**.

Further papers can be found by searching **PubMed**, which carries almost all the scientific papers written about helminthic therapy.

2016

[Molecular events by which dendritic cells promote Th2 immune protection in helminth infection](#)

[Maternal Helminth Infection Is Associated With Higher Infant Immunoglobulin A Titers to Antigen in Orally Administered Vaccines](#)

[Intimate gut interactions: helminths and the microbiota](#)

[Host parasite communications-Messages from helminths for the immune system](#)

[Experimental arthritis: Helminth infection ameliorates arthritis](#) [No abstract]

[Mice infected with a parasite show reduced symptoms of rheumatoid arthritis](#) Bob Yirka, Medical Xpress

[Th2 and eosinophil responses suppress inflammatory arthritis](#) [Full text | PDF]

[Practices and outcomes of self-treatment with helminths based on physicians' observations](#) The first study to probe, through the eyes of their physicians, the practices and experiences of individuals who are treating themselves with helminths.

[Helminths and Intestinal Flora Team Up to Improve Gut Health](#)

[The relationship between helminth infections and low haemoglobin levels in Ethiopian children with blood type A](#)

[Parasitic helminth infections and the control of human allergic and autoimmune disorders](#)

[Intestinal worms boost immune system in a surprising way](#) Nik Papageorgiou, Mediacom

[Interaction between Helminths and Toll-Like Receptors: Possibilities and Potentials for Asthma Therapy](#)

[Macrobiota - helminths as active participants and partners of the microbiota in host intestinal homeostasis](#)

[Diplomatic Assistance: Can Helminth-Modulated Macrophages Act as Treatment for Inflammatory Disease?](#) [Full text | PDF]

[Treatment with \*Trichuris suis\* soluble products during monocyte-to-macrophage differentiation reduces inflammatory responses through epigenetic remodeling](#)

[Helminth infection promotes colonization resistance via type 2 immunity](#) [Full text | PDF]

[Parasitic worms may prevent Crohn's disease by altering bacterial balance](#) Mitch Leslie, Science

[Comprehensive Transcriptome Meta-analysis to Characterize Host Immune Responses in Helminth Infections](#) [Full text]

[Cellular gene expression induced by parasite antigens and allergens in neonates from parasite-infected mothers](#)

[To Keep or Not to Keep a Hookworm](#) Iqbal Pittalwala, UCR Today

[Immune-regulatory mechanisms of classical and experimental multiple sclerosis drugs: a special focus on helminth-derived treatments](#)

[Microbes and asthma: Opportunities for intervention](#)

[Are Helminths to be Trusted as Allies in the War against Autoimmunity and Chronic Inflammation? \[PDF\]](#)

[Malaria, helminths, co-infection and anaemia in a cohort of children from Mutengene, south western Cameroon \[Full text | PDF\]](#)

[The parasitic worm-derived immunomodulator, ES-62 and its drug-like small molecule analogues exhibit therapeutic potential in a model of chronic asthma \[Full text | PDF\]](#)

[The Role of Helminth Infection and Environment in the Development of Allergy: A Prospective Study of Newly-Arrived Ethiopian Immigrants in Israel \[Full text\]](#)

[Therapeutic potential of recombinant cystatin from \*Schistosoma japonicum\* in TNBS-induced experimental colitis of mice \[Full text | PDF\]](#)

[Interactions between the intestinal microbiome and helminth parasites](#)

[Mast cells: new therapeutic target in helminth immune modulation \[Full text | PDF\]](#)

**2015**

[Helminth Products Protect against Autoimmunity via Innate Type 2 Cytokines IL-5 and IL-33, Which Promote Eosinophilia](#)

[Low-Dose Intestinal \*Trichuris muris\* Infection Alters the Lung Immune Microenvironment and Can Suppress Allergic Airway Inflammation \[Full text | PDF\]](#)

[Worming Their Way into the Picture: Microbiota Help Helminths Modulate Host Immunity](#)

[Hookworm larvae to be injected into coeliacs in bid to treat gluten intolerance ABC News](#)

[Cohabitation in the Intestine: Interactions among Helminth Parasites, Bacterial Microbiota, and Host Immunity](#)

[Can Helminth Infection Reverse Microbial Dysbiosis?](#)

[Drug-like analogues of the parasitic worm-derived immunomodulator ES-62 are therapeutic in the MRL/Lpr model of systemic lupus erythematosus \[Full text | PDF\]](#)

[Helminth infection, fecundity, and age of first pregnancy in women](#)

[The Intestinal Microbiota Contributes to the Ability of Helminths to Modulate Allergic Inflammation \[Full text | PDF\]](#)

[IL-35 is a critical regulator of immunity during helminth infections associated with multiple sclerosis](#)

[Experimental hookworm infection and escalating gluten challenges are associated with increased microbial richness in celiac subjects \[Full text | PDF\]](#)

[Type 2 immunity-dependent reduction of segmented filamentous bacteria in mice infected with the helminthic parasite \*Nippostrongylus brasiliensis\* \[Full text | PDF\]](#)

[The interaction of commensal intestinal bacteria with helminth parasites](#)

[Effect of different helminth extracts on the development of asthma in mice: The influence of early-life exposure and the role of IL-10 response](#)

[Interactions between multiple helminths and the gut microbiota in wild rodents \[Full text | PDF\]](#)

[Are Human Intestinal Eukaryotes Beneficial or Commensals? \[Full text | PDF\]](#)

[Tapeworms may be good for your brain Hanae Armitage, Science](#)

## [The Role of Adoptive Transfer of Immune Cells in Helminth- induced Regulation of Allergy and Autoimmune Diseases](#)

The hygiene hypothesis: current perspectives and future therapies [\[Full text has a PDF download link\]](#)

[Trichuris suis induces human non-classical patrolling monocytes via the mannose receptor and PKC: implications for multiple sclerosis](#) [\[Full text | PDF\]](#)

[Gut worms protect babies' brains from inflammation](#) Science Daily

[Enteric nematodes and the path to up-regulation of type 2 cytokines IL-4 and IL-13](#) (Includes mention of increased cell turnover to maintain an effective gut barrier in the presence of helminths.)

[Got Worms? Perinatal Exposure to Helminths Prevents Persistent Immune Sensitization and Cognitive Dysfunction Induced by Early-Life Infection](#)

[Suppression of inflammation by helminths: a role for the gut microbiota?](#) [\[Full text | PDF\]](#)

[Progress on reconstituting the depleted biome to prevent immune disorders](#) Parker and Morey, The Evolution and Medicine Review

[Helminth therapy for organic diseases?](#)

[Of worms and men - administration of helminth products as an innovative approach to treatment of autoimmune diseases](#)

[Significance of Diagnosing Parasitic Infestation in Evaluation of Unexplained Eosinophilia](#) [\[Full text | PDF\]](#)

[Chronic helminth infection and helminth-derived egg antigens promote adipose tissue M2 macrophages and improve insulin sensitivity in obese mice](#)

[Atopy and Asthma in Migrants: The Function of Parasites](#)

[Parasitic helminths and their beneficial impact on type 1 and type 2 diabetes](#)

[Prevention of Type 1 diabetes through parasite infection](#) [\[No abstract\]](#)

[Infection with Soil-Transmitted Helminths Is Associated with Increased Insulin Sensitivity](#) [\[Full text | PDF\]](#)

[The gut microbiome in the helminth infected host](#)

[Clinical trials of helminth therapy in autoimmune diseases: rationale and findings](#)

[Prophylactic and therapeutic treatment with a synthetic analogue of a parasitic worm product prevents experimental arthritis and inhibits IL-1 \$\beta\$  production via NRF2-mediated counter-regulation of the inflammasome](#) [\[Full text | PDF\]](#)

[Identifying the immunomodulatory components of helminths](#)

[Not all parasites are protective](#) [\[Full text | PDF\]](#)

[Trichuris suis soluble products induce Rab7b expression and limit TLR4 responses in human dendritic cells](#)

[Immune responses in children infected with the pinworm Enterobius vermicularis in central Greece](#)

[A worm of one's own: how helminths modulate host adipose tissue function and metabolism](#)

[Comments on TSO for Autism from a European Biomedical Center for Autism Research](#)

[Approaches to studying and manipulating the enteric microbiome to improve autism symptoms](#) [\[Full text | PDF\]](#)

[Alteration of the rat cecal microbiome during colonization with the helminth Hymenolepis dimunita](#) [\[Full text | PDF\]](#)

[Chronic Trichuris muris Infection in C57BL/6 Mice Causes Significant Changes in Host Microbiota and Metabolome: Effects Reversed by Pathogen Clearance](#) [Full text | PDF]

[Helminths improve insulin sensitivity and enhance M2 macrophage numbers in WAT of obese mice](#) [No abstract]

[Type 1 diabetes pathogenesis - Prevention???](#) [Full text]

[Helminths and autoimmunity: the good, the bad and the ugly](#) [PDF]

[Unraveling the Hygiene Hypothesis of helminthes and autoimmunity: origins, pathophysiology, and clinical applications](#) [Full text | PDF]

[Helminths and the microbiota: parts of the hygiene hypothesis](#) [PDF]

[Increased Biodiversity in the Environment Improves the Humoral Response of Rats](#) (Report by Science Daily, [here](#).)

[The parasitic worm product ES-62 targets myeloid differentiation factor 88-dependent effector mechanisms to suppress antinuclear antibody production and proteinuria in MRL/lpr mice](#) [Full text | PDF] (A worm-derived immunomodulator protects against kidney damage in lupus/SLE)

[Exosome-transported microRNAs of helminth origin: new tools for allergic and autoimmune diseases therapy?](#)

[From the worm to the pill, the parasitic worm product ES-62 raises new horizons in the treatment of rheumatoid arthritis](#) [Full text | PDF]

[Human helminth therapy to treat inflammatory disorders - where do we stand?](#) [Full text | PDF]

[Immune Antibodies and Helminth Products Drive CXCR2-Dependent Macrophage-Myofibroblast Crosstalk to Promote Intestinal Repair](#) [Full text | PDF]

[Epidemiological study of the association between malaria and helminth infections in Nigeria](#) [Full text | PDF]

[Overcoming Evolutionary Mismatch by Self-Treatment with Helminths: Current Practices and Experience](#) [PDF] The first study to probe the methods and outcomes reported by individuals self-treating with helminths.

[Does Strongyloides stercoralis infection protect against type 2 diabetes in humans? Evidence from Australian Aboriginal adults](#)

[The immunomodulatory parasitic worm product ES-62 reduces lupus-associated accelerated atherosclerosis in a mouse model](#) [Full text | PDF]

[The relationship between intestinal parasites and some immune-mediated intestinal conditions](#) [Full text | PDF]

[A role for helminth parasites in achieving immunological tolerance in transplantation](#)

[Helminth infections and type 2 diabetes: a cluster-randomized placebo controlled SUGARSPIN trial in Nangapanda, Flores, Indonesia](#) [Full text | PDF]

[A novel regulatory macrophage induced by a helminth molecule instructs IL-10 in CD4+ T cells and protects against mucosal inflammation](#) [Full text | PDF]

[Intestinal helminths regulate lethal acute graft-versus-host disease and preserve the graft-versus-tumor effect in mice](#) (Helminths improve the outcome of bone marrow transplantation in mice)

[Helminthes and insects: maladies or therapies](#)

[Experimental hookworm infection and gluten microchallenge promote tolerance in celiac disease](#) (Reports by EurekaAlert and ABC Australia, [here](#) and [here](#).)

[Potential Treatments for Food Allergy](#)

[The mechanisms behind helminth's immunomodulation in autoimmunity](#)

[A model for the induction of autism in the ecosystem of the human body: the anatomy of a modern pandemic?](#) [Full text | PDF]

[Splenic B cells from Hymenolepis diminuta-infected mice ameliorate colitis independent of T cells and via cooperation with macrophages](#)

[Treatment with egg antigens of Schistosoma mansoni ameliorates experimental colitis in mice through a colonic T-cell-dependent mechanism](#)

[Multiple sclerosis and environmental factors: the role of vitamin D, parasites, and Epstein-Barr virus infection](#)

2014

[Helminth Therapy for MS \(multiple sclerosis\)](#)

[Reduced asthma morbidity in endemic areas for helminth infections: a longitudinal ecological study in Brazil](#)

[In utero priming by worms protects against respiratory allergies](#)

[The emerging role of helminths in treatment of the inflammatory bowel disorders](#) [PDF]

[Maternal immune response to helminth infection during pregnancy determines offspring susceptibility to allergic airway inflammation](#)

[Potential treatment of inflammatory bowel disease: a review of helminths therapy](#) [Full text | PDF]

[Coincident helminth infection modulates systemic inflammation and immune activation in active pulmonary tuberculosis](#) [Full text | PDF]

[Impact of experimental hookworm infection on the human gut microbiota](#) [Full text | PDF]

[Therapeutic potential of larval excretory/secretory proteins of the pig whipworm Trichuris suis in allergic disease](#)

[Priming dendritic cells for th2 polarization: lessons learned from helminths and implications for metabolic disorders](#) [Full text | PDF]

[Do We Need Worms to Promote Immune Health?](#)

[Helminth infections decrease host susceptibility to immune-mediated diseases](#) [Full text | PDF]

[Treating Inflammatory Bowel disease: from Helminths to ova](#) [PDF]

[Allergy and worms: let's bring back old friends](#)

[The microbiota and helminths: sharing the same niche in the human host](#)

[Mucosal immune responses following intestinal nematode infection](#) [Full text | PDF]

[Kv1.3 channel-blocking immunomodulatory peptides from parasitic worms: implications for autoimmune diseases](#) [Full text | PDF]

[Blockade of IL-33 release and suppression of type 2 innate lymphoid cell responses by helminth secreted products in airway allergy](#) [Full text | PDF]

[Re: The "hygiene hypothesis" for allergic disease is a misnomer](#) David Strachan, The BMJ

[The "hygiene hypothesis" for allergic disease is a misnomer](#) William Parker, The BMJ

[Pregnancy and helminth infections](#) [Full text | PDF]

[Helminth infections, type-2 immune response, and metabolic syndrome](#) [Full text | PDF]

[Lessons from helminth infections: ES-62 highlights new interventional approaches in rheumatoid arthritis](#) [Full text | PDF]

[Systemic impact of intestinal helminth infections](#) [PDF]

[Microbial 'old friends', immunoregulation and socioeconomic status](#) [Full text | PDF]

[ES-62 protects against collagen-induced arthritis by resetting interleukin-22 toward resolution of inflammation in the joints](#) [Full text | PDF]

[Helminth/Parasite treatment of multiple sclerosis](#)

[Helminth colonization is associated with increased diversity of the gut microbiota](#) [Full text | PDF]

[The human-hookworm assemblage: contingency and the practice of helminthic therapy](#) Sophia Ann Strosberg, PhD thesis

[Induction of regulatory cells by helminth parasites: exploitation for the treatment of inflammatory diseases](#)

[Parasitic worms and allergies in childhood: insights from population studies 2008-2013](#)

[Intestinal Helminthic Infection Increases Serum Levels of IL-2 and Decreases Serum TGF-Beta Levels in Nigerian Asthmatic Patients](#) [Full text | PDF]

[A multimodal Darwinian strategy for alleviating the atherosclerosis pandemic](#)

[Secreted proteins from the helminth \*Fasciola hepatica\* inhibit the initiation of autoreactive T cell responses and prevent diabetes in the NOD mouse](#) [Full text | PDF]

[Reprogramming macrophages to an anti-inflammatory phenotype by helminth antigens reduces murine atherosclerosis](#) [Full text | PDF]

[Microbiota, immunoregulatory old friends and psychiatric disorders](#)

**2013**

[Presentation of Interim Data From Autism Study at Neuropsychopharmacology Meeting](#)

[Regulation of the immune system by biodiversity from the natural environment: an ecosystem service essential to health](#) [Full text | PDF]

[Helminths and their implication in sepsis - a new branch of their immunomodulatory behaviour?](#) [Full text | PDF]

[Parasite infections in multiple sclerosis modulate immune responses through a retinoic acid-dependent pathway](#) [Full text | PDF]

[The hygiene theory harnessing helminths and their ova to treat autoimmunity](#)

[\*Heligmosomoides polygyrus\* infection reduces severity of type 1 diabetes induced by multiple low-dose streptozotocin in mice via STAT6- and IL-10-independent mechanisms](#)

[Dueling Infections: One Keeps the Other at Bay, Say UCSB Anthropologists](#) Andrea Estrada, The Current, University of California, Santa Barbara

[Antagonism between two intestinal parasites in humans: the importance of co-infection for infection risk and recovery dynamics](#) [Full text | PDF]

[Schistosoma mansoni-mediated suppression of allergic airway inflammation requires patency and Foxp3+ Treg cells](#) [Full text | PDF]

[Randomised clinical trial: the safety and tolerability of \*Trichuris suis\* ova in patients with Crohn's disease](#) [Full text | PDF]

[Possible use of \*Trichuris suis\* ova in autism spectrum disorders therapy](#)

[Coassociations between IL10 polymorphisms, IL-10 production, helminth infection, and asthma/wheeze in an urban tropical population in Brazil](#)

[Hookworm excretory/secretory products induce interleukin-4 \(IL-4\)+ IL-10+ CD4+ T cell responses and suppress pathology in a mouse model of colitis](#) [Full text | PDF]

[Parasitic nematode-induced modulation of body weight and associated metabolic dysfunction in mouse models of obesity](#) [Full text | PDF]

[Previous contact with \*Strongyloides venezuelensis\* contributed to prevent insulinitis in MLD-STZ diabetes](#) [Full text includes a PDF download link]

[The development of TH2 responses from infancy to 4 years of age and atopic sensitization in areas endemic for helminth infections](#) [Full text | PDF]

[A role for IL-22 in the relationship between intestinal helminths, gut microbiota and mucosal immunity](#) [Full text | PDF]

[Changed gluten immunity in celiac disease by \*Necator americanus\* provides new insights into autoimmunity](#)

[The helminth product, ES-62, protects against airway inflammation by resetting the Th cell phenotype](#) [Full text | PDF]

[A nematode immunomodulator suppresses grass pollen-specific allergic responses by controlling excessive Th2 inflammation](#)

[Helminth therapy and multiple sclerosis](#) [Full text]

[Childhood helminth exposure is protective against inflammatory bowel disease: a case control study in South Africa](#)

[Prevention of type 1 diabetes through infection with an intestinal nematode parasite requires IL-10 in the absence of a Th2-type response](#)

[Helminth mediated modulation of Type 1 diabetes \(T1D\)](#) [PDF]

[Association of previous schistosome infection with diabetes and metabolic syndrome: a cross-sectional study in rural China](#)

[Evolutionary immune response to conserved domains in parasites and aeroallergens](#)

**Patients self-treat with parasitic worms** In this letter to the journal, Nature, two researchers called on the scientific community to adopt an approach to the development of helminth therapeutics that would recognise and utilise the insights and evidence being gained by citizen scientists who are self-treating with helminths.

[Microbial 'Old Friends', immunoregulation and stress resilience](#) [Full text | PDF]

**Evolutionary biology and anthropology suggest biome reconstitution as a necessary approach toward dealing with immune disorders** [Full text | PDF] This paper explains how the modern pandemics of autoimmune, inflammatory and allergic disease are due to the loss of species, especially helminths, from the human ecosystem.

[Protection against allergic airway inflammation during the chronic and acute phases of \*Trichinella spiralis\* infection](#)

[Relationship between carotid intima media thickness and helminth infections on Flores Island, Indonesia](#) [Full text | PDF] (atherosclerosis)

[Immune regulation during helminth infections](#) [Full text | PDF]

2012

[Helminth infection and type 1 diabetes](#) [Full text | PDF]

[The hookworm pharmacopoeia for inflammatory diseases](#) [Full text | PDF]

[Anti-atherogenic effect and its mechanisms of soluble egg antigen of \*Schistosoma japonicum\* in ApoE<sup>-/-</sup> mice \(atherosclerosis\)](#)

[Therapeutic helminth infection of macaques with idiopathic chronic diarrhea alters the inflammatory signature and mucosal microbiota of the colon](#) [Full text | PDF]

[How helminths use excretory secretory fractions to modulate dendritic cells](#) [Full text | PDF]

[The worm returns](#) [Full text | PDF]



[Helminth infection in populations undergoing epidemiological transition: a friend or foe? \[Author's personal full text copy\]](#)

[Where are we on worms? \[Full text | PDF\]](#)

[Nematode modulation of inflammatory bowel disease \[Full text | PDF\]](#)

[Heligmosomoides polygyrus: EAE remission is correlated with different systemic cytokine profiles provoked by L4 and adult nematodes \(Multiple sclerosis\)](#)

[The parasitic helminth product ES-62 suppresses pathogenesis in collagen-induced arthritis by targeting the interleukin-17-producing cellular network at multiple sites \[Full text | PDF\]](#)

[Advances in immunotherapy for food allergy \[Full text\]](#) Yamini Virkud and Brian Vickery, Discovery Magazine

[Immune monitoring of Trichuris suis egg therapy in multiple sclerosis patients](#)

[Does helminth activation of toll-like receptors modulate immune response in multiple sclerosis patients? \[Full text | PDF\]](#)

[Trichuris suis ova: testing a helminth-based therapy as an extension of the hygiene hypothesis \[PDF\]](#)

[Helminth infection is associated with decreased basophil responsiveness in human beings \[Full text | PDF\]](#)

[A prescription for clinical immunology: the pills are available and ready for testing. A review](#)

[Is autism a member of a family of diseases resulting from genetic/cultural mismatches? Implications for treatment and prevention \[Full text | PDF\]](#)

[Soluble helminth products suppress clinical signs in murine experimental autoimmune encephalomyelitis and differentially modulate human dendritic cell activation](#)

[Helminthic therapy: improving mucosal barrier function \[Full text | PDF\]](#)

[Helminth therapy \(worms\) for allergic rhinitis \[PDF\]](#)

[Parasitic worm therapy for allergy: is this incongruous or avant-garde medicine?](#)

[Granulocytes in helminth infection -- who is calling the shots? \[Full text | PDF\]](#)

[Atopy is inversely related to schistosome infection intensity: a comparative study in Zimbabwean villages with distinct levels of Schistosoma haematobium infection \[Full text | PDF\]](#)

[Schistosoma mansoni antigens as modulators of the allergic inflammatory response in asthma](#)

[The hygiene hypothesis: an explanation for the increased frequency of insulin-dependent diabetes \[Full text | PDF\]](#)

**[Helminth-host immunological interactions: prevention and control of immune-mediated diseases \[Full text | PDF\]](#)** Summarises the science underpinning helminthic therapy.

[A Darwinian View of the Hygiene or "Old Friends" Hypothesis](#) Graham A. W. Rook, Microbe Magazine

[Helminth antigens enable CpG-activated dendritic cells to inhibit the symptoms of collagen-induced arthritis through Foxp3+ regulatory T cells \[Full text | PDF\]](#)

[Asthma and allergic disease: their relation with Necator americanus and other helminth infections](#) Johanna Feary, PhD Thesis [PDF]

**2011**

[Schistosoma japonicum ova maintains epithelial barrier function during experimental colitis \[Full text | PDF\]](#)

[Hookworm products ameliorate dextran sodium sulfate-induced colitis in BALB/c mice](#)

[The impact of environmental infections \(parasites\) on MS activity \(multiple sclerosis\)](#)

**Reconstitution of the human biome as the most reasonable solution for epidemics of allergic and autoimmune diseases** This paper called for the commitment of considerable resources towards understanding the effects of biome depletion and the systematic evaluation of the most effective approach to biome reconstitution.

[Treatment with anthelmintics during pregnancy: what gains and what risks for the mother and child?](#) [Full text | PDF]

[Effects of Helicobacter pylori, geohelminth infection and selected commensal bacteria on the risk of allergic disease and sensitization in 3-year-old Ethiopian children](#)

[Regulatory B-cell induction by helminths: implications for allergic disease](#)

[Exposure to hookworms in patients with Crohn's disease: a case-control study](#) [Full text | PDF]

[Toll-like receptor activation by helminths or helminth products to alleviate inflammatory bowel disease](#) [Full text | PDF]

[Suppression of inflammatory immune responses in celiac disease by experimental hookworm infection](#) [Full text | PDF]

[Parasitic helminth cystatin inhibits DSS-induced intestinal inflammation via IL-10\(+\)/F4/80\(+\) macrophage recruitment](#) [Full text | PDF]

[Impact of Schistosoma japonicum infection on collagen-induced arthritis in DBA/1 mice: a murine model of human rheumatoid arthritis](#) [Full text | PDF]

[Excretory-Secretory Products from Hookworm L3 and Adult Worms Suppress Proinflammatory Cytokines in Infected Individuals](#) [Full text | PDF]

[Atopic dermatitis and the hygiene hypothesis revisited](#)

[Schistosome infection intensity is inversely related to auto-reactive antibody levels](#) [Full text | PDF]

[The impact of parasite infections on the course of multiple sclerosis](#)

[Helminths and multiple sclerosis: will old friends give us new treatments for MS?](#) [No abstract]

[Effect of hookworm infection on wheat challenge in celiac disease - a randomised double-blinded placebo controlled trial](#) [Full text | PDF]

[Probiotic helminth administration in relapsing-remitting multiple sclerosis: a phase 1 study](#) [Full text | PDF]

[Clonorchis sinensis-derived total protein attenuates airway inflammation in murine asthma model by inducing regulatory T cells and modulating dendritic cell functions](#)

[Helminth parasites and the modulation of joint inflammation](#) [Full text | PDF]

[Infection with an intestinal helminth parasite reduces Freund's complete adjuvant-induced monoarthritis in mice](#) [Full text | PDF]

[Trichinella spiralis: infection reduces airway allergic inflammation in mice](#)

[The transcriptome of Trichuris suis -- first molecular insights into a parasite with curative properties for key immune diseases of humans](#) [Full text | PDF]

[Impact of Schistosoma japonicum infection on collagen-induced arthritis in DBA/1 mice: a murine model of human rheumatoid arthritis](#) [Full text | PDF]

**2010**

[IL-22+ CD4+ T cells are associated with therapeutic trichuris trichiura infection in an ulcerative colitis patient](#) [PDF]

[Alteration of the murine gut microbiota during infection with the parasitic helminth Heligmosomoides polygyrus](#) [Full text | PDF]

[Long-term periodic anthelmintic treatments are associated with increased allergen skin reactivity](#) [Full text | PDF]

[Atopic diseases and intestinal helminth infections](#)

**Reconstituting the depleted biome to prevent immune disorders** William Parker, Evolution and Medicine Review. Explains why replacing absent "old friends" may be the only reasonable therapy for a wide range of immune-associated disorders, including allergy, autoimmunity and autism.

[Effects of Deworming during Pregnancy on Maternal and Perinatal Outcomes in Entebbe, Uganda: A Randomized Controlled Trial](#) [Full text | PDF]

[Chronic intestinal helminth infections are associated with immune hyporesponsiveness and induction of a regulatory network](#) [Full text | PDF]

[How the parasitic worm has turned](#) University of Manchester press release

[Exploitation of the intestinal microflora by the parasitic nematode \*Trichuris muris\*](#) [Full text | PDF]

[Helminth-induced CD19+CD23hi B cells modulate experimental allergic and autoimmune inflammation](#) [Full text | PDF]

[Schistosoma mansoni antigens modulate the allergic response in a murine model of ovalbumin-induced airway inflammation](#) [Full text | PDF]

[99th Dahlem conference on infection, inflammation and chronic inflammatory disorders: darwinian medicine and the 'hygiene' or 'old friends' hypothesis](#) [Full text | PDF]

[Immunomodulators of helminthes: Promising therapeutics for autoimmune disorders and allergic diseases](#) [Full text | PDF]

[In vitro-derived alternatively activated macrophages reduce colonic inflammation in mice](#) (Colitis)

[Extracts of the rat tapeworm, \*Hymenolepis diminuta\*, suppress macrophage activation in vitro and alleviate chemically induced colitis in mice](#) [Full text | PDF]

[Parasitic helminths: new weapons against immunological disorders](#) [Full text | PDF]

[Worms to the rescue: can worm glycans protect from autoimmune diseases?](#) [Full text | PDF]

[Taenia crassiceps infection attenuates multiple low-dose streptozotocin-induced diabetes](#) [Full text | PDF]

[Trichuris suis ova therapy for allergic rhinitis: a randomized, double-blind, placebo-controlled clinical trial](#) [PDF]

[Reduced helminth burden increases allergen skin sensitization but not clinical allergy: a randomized, double-blind, placebo-controlled trial in Vietnam](#)

[Regulation of type 1 diabetes, tuberculosis, and asthma by parasites](#) [Full text | PDF]

[Helminth infection inhibits airway allergic reaction and dendritic cells are involved in the modulation process](#) [Full text | PDF]

[Chronic helminth infections protect against allergic diseases by active regulatory processes](#) [Full text | PDF]

[Dendritic cells in the gut: interaction with intestinal helminths](#) [Full text | PDF]

[Taenia crassiceps infection attenuates multiple low-dose streptozotocin-induced diabetes](#) [Full text | PDF]

**2009**

[Experimental hookworm infection: a randomized placebo-controlled trial in asthma](#) [Full text | PDF]

[Helminth infection can reduce insulinitis and type 1 diabetes through CD25- and IL-10-independent mechanisms](#) [Full text | PDF]

[Early helminth infections are inversely related to anemia, malnutrition, and malaria and are not associated with inflammation in 6- to 23-month-old Zanzibari children](#) [Full text | PDF]

[Helminth antigens modulate immune responses in cells from multiple sclerosis patients through TLR2-dependent mechanisms](#) [Full text | PDF]

[Immunologic profiles of persons recruited for a randomized, placebo-controlled clinical trial of hookworm infection](#) [Full text | PDF]

[Survival of the fittest: allergology or parasitology?](#)

[Hookworms can prevent asthma](#) News Medical

[Prebiotics, probiotics and helminths: the 'natural' solution?](#)

[Infection with \*Hymenolepis diminuta\* Is More Effective than Daily Corticosteroids in Blocking Chemically Induced Colitis in Mice](#) [Full text | PDF]

[Helminth immunoregulation: the role of parasite secreted proteins in modulating host immunity](#) [Full text]

[Advances in the pathogenesis and treatment of IBD](#) [Full text | PDF]

[Parasites represent a major selective force for interleukin genes and shape the genetic predisposition to autoimmune conditions](#) [Full text | PDF]

[Helminths and our immune system: friend or foe?](#)

[Immune and genetic aspects of asthma, allergy and parasitic worm infections: evolutionary links](#) [Full text | PDF]

[Effect of administration of antihelminthics for soil transmitted helminths during pregnancy](#)

[Schistosoma mansoni egg antigens induce Treg that participate in diabetes prevention in NOD mice](#) [Full text | PDF]

[Necator americanus infection: a possible cause of altered dendritic cell differentiation and eosinophil profile in chronically infected individuals](#) [Full text | PDF]

**Worms for Immune Regulation of Multiple Sclerosis (WIRMS)** Reports by Science Daily and the Mail Online, [here](#) and [here](#). Proposal for the first Phase 2 trial using a controlled number of *Necator americanus* in the treatment of Multiple Sclerosis.

[The therapeutic helminth?](#)

[Schistosoma mansoni infection reduces severity of collagen-induced arthritis via down-regulation of pro-inflammatory mediators](#)

[Can helminths or helminth-derived products be used in humans to prevent or treat allergic diseases?](#)

[Schistosoma mansoni infection alters co-stimulatory molecule expression and cell activation in asthma](#)

[Spontaneous arthritis in MRL/lpr mice is aggravated by Staphylococcus aureus and ameliorated by Nippostrongylus brasiliensis infections](#)

[Review series on helminths, immune modulation and the hygiene hypothesis: mechanisms underlying helminth modulation of dendritic cell function](#) [Full text | PDF]

[Review series on helminths, immune modulation and the hygiene hypothesis: the broader implications of the hygiene hypothesis](#) [Full text | PDF]

[Review series on helminths, immune modulation and the hygiene hypothesis: immunity against helminths and immunological phenomena in modern human populations: coevolutionary legacies?](#) [Full text | PDF]

[Review series on helminths, immune modulation and the hygiene hypothesis: how might infection modulate the onset of type 1 diabetes?](#) [Full text | PDF]

**Helminths and the IBD hygiene hypothesis** This paper proposed that failure to acquire helminths in early life negatively affects immune development, leading to immunological diseases such as IBD later in life.

[Do helminth parasites protect against atopy and allergic disease?](#)

[Helminth antigen-based strategy to ameliorate inflammation in an experimental model of colitis](#) [Full text | PDF]

[Helminthic therapy: using worms to treat immune-mediated disease](#)

**2008**

[Early infection with \*Trichuris trichiura\* and allergen skin test reactivity in later childhood](#)

[Schistosoma japonicum infection modulates the development of allergen-induced airway inflammation in mice](#)

[The changing microbial environment and chronic inflammatory disorders](#) [Full text | PDF]

[Parasitic nematode modulation of allergic disease](#)

[Helminth infections associated with multiple sclerosis induce regulatory B cells](#)

[Decreased basal non-insulin-stimulated glucose uptake by diaphragm in streptozotocin-induced diabetic mice infected with \*Schistosoma mansoni\*](#)

[The role of regulatory T cells in multiple sclerosis](#)

[Worms and the treatment of inflammatory bowel disease: are molecules the answer?](#) [Full text | PDF]

[A helminth immunomodulator reduces allergic and inflammatory responses by induction of IL-10-producing macrophages](#) [Full text | PDF]

[Helminth infection with \*Litomosoides sigmodontis\* induces regulatory T cells and inhibits allergic sensitization, airway inflammation, and hyperreactivity in a murine asthma model](#) [Full text | PDF]

[Soluble egg antigen from \*Schistosoma japonicum\* modulates the progression of chronic progressive experimental autoimmune encephalomyelitis via Th2-shift response](#)

[Hygiene hypothesis in inflammatory bowel disease: a critical review of the literature](#) [Full text | PDF]

**2007**

[Worms tame mast cells](#) Edward J Pearce, Nature Medicine

[The hygiene hypothesis and the increasing prevalence of chronic inflammatory disorders](#)

[Schistosoma japonicum eggs modulate the activity of CD4+ CD25+ Tregs and prevent development of colitis in mice](#)

[Stage-specific immune responses in human \*Necator americanus\* infection](#) [Full text | PDF]

[Interrelationship among asthma, atopy, and helminth infections](#) [Full text | PDF]

[An inverse relationship between autoimmune liver diseases and \*Strongyloides stercoralis\* infection](#) [Full text | PDF]

[Helminths, allergic disorders and IgE-mediated immune responses: where do we stand?](#) [Full text | PDF]

[Infection with a helminth parasite prevents experimental colitis via a macrophage-mediated mechanism](#) [Full text | PDF]

[The use of \*Trichuris suis\* and other helminth therapies to treat Crohn's disease](#)

[Helminths as governors of immune-mediated inflammation](#)

[Modulation of anaphylaxis by helminth-derived products in animal models](#)

[Helminth infection enhances disease in a murine TH2 model of colitis](#)

[Helminth-derived products inhibit the development of allergic responses in mice](#)

[Association between parasite infection and immune responses in multiple sclerosis](#) (Reports by Science Daily and the BBC, [here](#) and [here](#).) This was the first study to explore the effect of helminth infection on immune response and the natural course of Relapsing Remitting Multiple Sclerosis. It showed that MS was effectively arrested in patients who hosted intestinal worms.

[Iatrogenic \*Trichuris suis\* infection](#)

[Inhibition of autoimmune type 1 diabetes by gastrointestinal helminth infection](#) [Full text | PDF]

[Schistosoma japonicum egg antigens stimulate CD4 CD25 T cells and modulate airway inflammation in a murine model of asthma](#) [Full text | PDF]

[Regulation of the immune system in metazoan parasite infections](#)

[Autism, asthma, inflammation, and the hygiene hypothesis](#) [Full text | PDF]

2006

[Multiple sclerosis and the hygiene hypothesis](#) [no abstract]

[Poor sanitation and helminth infection protect against skin sensitization in Vietnamese children: A cross-sectional study](#)

[Dose-ranging study for trials of therapeutic infection with \*Necator americanus\* in humans](#) [Full text | PDF] This study sought to determine the dose of hookworms that would be suitable for use in preliminary therapeutic trials in patients with asthma.

[Helminths and HIV infection: epidemiological observations on immunological hypotheses](#) [Full text | PDF]

[Intestinal helminths: a clue explaining the low incidence of inflammatory bowel diseases in Sub-Saharan Africa? Potential benefits and hazards of helminth therapy](#)

[The hygiene hypothesis and inflammatory bowel diseases: role of helminths](#)

[Parasitic worms and inflammatory diseases](#) [Full text | PDF]

[What is the origin of ulcerative colitis? Still more questions than answers](#) [Full text | PDF]

[Worms and allergy](#) [Full text | PDF]

[Asthma and current intestinal parasite infection: systematic review and meta-analysis](#)

[Schistosoma mansoni antigen-driven interleukin-10 production in infected asthmatic individuals](#) [Full text | PDF]

[Intestinal helminths protect in a murine model of asthma](#) [Full text | PDF]

[Allergy controls the population density of \*Necator americanus\* in the small intestine](#)

[Helminths and mucosal immune modulation](#)

[A time course study of immunological responses in \*Trichuris suis\* infected pigs demonstrates induction of a local type 2 response associated with worm burden](#)

[Prevention of psoriasis-like lesions development in fsn/fsn mice by helminth glycans](#)

[Regulatory T cells in human disease and their potential for therapeutic manipulation](#) [Full text | PDF]

[Mechanisms of disease: the hygiene hypothesis revisited](#)

[Environmental exposures, genetic predisposition and allergic diseases: one size never fits all](#) [Full text | PDF]

[Helminths can protect themselves against rejection inhibiting hostile respiratory allergy symptoms](#) [Full text | PDF]

[The hygiene hypothesis and atopy: bring back the parasites?](#)

[A proof of concept study establishing \*Necator americanus\* in Crohn's patients and reservoir donors](#) [Full text | PDF] Investigated whether Crohn's disease patients would tolerate a hookworm infection, and the practical issues associated with establishing reservoir donors for this helminth species.

[Geohelminth infections: impact on allergic diseases](#)

[Glycans modulate immune responses in helminth infections and allergy](#)

[Helminth-induced immunoregulation of an allergic response to food](#) (food allergy)

2005

[Immune responses following experimental human hookworm infection](#) [Full text | PDF]

[Old friends for breakfast](#) Suggested that a symbiotic relationship exists between humans and the fauna that have co-evolved in the human GI tract.

[Neutralizing anti-IL-10 antibody blocks the protective effect of tapeworm infection in a murine model of chemically induced colitis](#) [Full text | PDF]

[Trichuris suis therapy for active ulcerative colitis: a randomized controlled trial](#) [PDF]

[Parasite role reversal: worms on trial](#)

[Gastrointestinal parasites: potential therapy for refractory inflammatory bowel diseases](#)

[Trichuris suis therapy in Crohn's disease](#) [Full text | PDF] (Report by Medical News Today, [here](#).) A helminth (TSO) is shown to offer a unique, safe and effective treatment for Crohn's disease, and potentially protection against other immunological disorders.

[Will worms really cure Crohn's disease?](#) [Full text | PDF (see pages 6-8)]

[The hygiene hypothesis and asthma](#)

[Can worms defend our hearts? Chronic helminthic infections may attenuate the development of cardiovascular diseases](#)

2004

[Parasitic helminths tip the balance: potential anti-inflammatory therapies](#) [Full text | PDF]

[Helminth infection protects mice from anaphylaxis via IL-10-producing B cells](#) [Full text | PDF]

[Schistosoma mansoni infection modulates the immune response against allergic and auto-immune diseases](#) [Full text | PDF]

[Helminth parasites - masters of regulation](#)

[A Secreted Protein from the Human Hookworm \*Necator americanus\* Binds Selectively to NK Cells and Induces IFN- \$\gamma\$  Production](#) [PDF]

[Immunotherapy. Can worms tame the immune system?](#)

[The increased prevalence of allergy and the hygiene hypothesis: missing immune deviation, reduced immune suppression, or both?](#) [Full text | PDF]

[A review of autism and the immune response](#) [PDF]

[Inhibition of neutrophil recruitment by ES of \*Nippostrongylus brasiliensis\*](#) [Full text | PDF]

[Regulation of allergy and autoimmunity in helminth infection](#)

[The innate allergenicity of helminth parasites](#)

[Mycobacteria and other environmental organisms as immunomodulators for immunoregulatory disorders](#)

[Parasites and the hygiene hypothesis: regulating the immune system?](#)

[Concurrent infection with \*Schistosoma mansoni\* attenuates inflammation induced changes in colonic morphology, cytokine levels, and smooth muscle contractility of trinitrobenzene sulphonic acid induced colitis in rats](#) [Full text | PDF]

[Review article: helminths as therapeutic agents for inflammatory bowel disease](#)

[Helminths and harmony](#) [Full text | PDF (Pages 7-9)]

**2003**

[Schistosomiasis decreases central nervous system inflammation and alters the progression of experimental autoimmune encephalomyelitis](#) [Full text | PDF]

[Trichuris suis seems to be safe and possibly effective in the treatment of inflammatory bowel disease](#) This trial showed that pig whipworm ova (TSO) can reduce symptoms of Crohn's disease without producing side effects.

[Immune regulation by helminth parasites: cellular and molecular mechanisms](#)

[Reduced risk of atopy among school-age children infected with geohelminth parasites in a rural area of the tropics](#)

[Schistosoma mansoni antigens modulate the activity of the innate immune response and prevent onset of type 1 diabetes](#) [Full text | PDF]

[Exposure to schistosome eggs protects mice from TNBS-induced colitis](#) [Full text | PDF]

[Immunomodulation of experimental autoimmune encephalomyelitis by helminth ova immunization](#) [Full text | PDF]

**2002**

[Intestinal nematode infection ameliorates experimental colitis in mice](#) [Full text | PDF]

[An anti-atherogenic effect of \*Schistosoma mansoni\* infections in mice associated with a parasite-induced lowering of blood total cholesterol \(cardiovascular/cholesterol/atherosclerosis\)](#)

[Eosinophilic inflammation and airway hyper-responsiveness are profoundly inhibited by a helminth \(\*Ascaris suum\*\) extract in a murine model of asthma](#)

[The effect of infections on susceptibility to autoimmune and allergic diseases](#)

[An enteric helminth infection protects against an allergic response to dietary antigen](#) [Full text | PDF]

[Can intestinal helminth infections \(geohelminths\) affect the development and expression of asthma and allergic disease?](#) [Full text | PDF]

[Allergy, parasites, and the hygiene hypothesis](#)

**2001**

[Independent effects of intestinal parasite infection and domestic allergen exposure on risk of wheeze in Ethiopia: a nested case-control study](#)

[The prevalence of parasite infestation and house dust mite sensitization in Gabonese schoolchildren](#)

[Immune responses in hookworm infections](#) [Full text | PDF]

[Is \*Necator americanus\* approaching a mutualistic symbiotic relationship with humans?](#)



2000

[Decreased atopy in children infected with Schistosoma haematobium: a role for parasite-induced interleukin-10](#)

[Chronic immune activation associated with intestinal helminth infections results in impaired signal transduction and anergy](#) [Full text | PDF] Reduced immune responses were found in patients hosting helminths.

[Does the failure to acquire helminthic parasites predispose to Crohn's disease?](#) [Full text | PDF] Failure to acquire helminths was linked to the prevalence of Crohn's disease, a finding that was key in the development of the Hygiene Hypothesis.

[Antigen-specific cellular hyporesponsiveness in a chronic human helminth infection is mediated by T\(h\)3/T\(r\)1-type cytokines IL-10 and transforming growth factor-beta but not by a T\(h\)1 to T\(h\)2 shift](#) [Full text | PDF]

1999

[Infection with Schistosoma mansoni prevents insulin dependent diabetes mellitus in non-obese diabetic mice](#) [PDF]

1996

[IgE, allergies and helminth parasites: a new perspective on an old conundrum](#) [Full text | PDF]

[Immune dysregulation in Ethiopian immigrants in Israel: relevance to helminth infections?](#) [PDF]

[Prolongation of rat kidney allograft survival by nematodes](#)

[Impairment of tetanus toxoid-specific Th1-like immune responses in humans infected with Schistosoma mansoni](#) [Full text | PDF]

1993

[Modulation of murine cytokine responses to mycobacterial antigens by helminth-induced T helper 2 cell responses](#)

[Modulation of the allergic reactivity of slum children by helminthic infection](#)

1992

[Infection with Schistosoma mansoni alters Th1/Th2 cytokine responses to a non-parasite antigen](#)

1989

[Hay fever, hygiene, and household size](#) [Full text | PDF] This paper linked exposure to pathogens whilst young to the development of allergic diseases, and was key to the development of the Hygiene Hypothesis.

1982

[Modulation of immune responses by commensal bacteria and intestinal helminth](#) [PDF]

1979

[Epidemiology of chronic intestinal disease in middle Africa](#) This was one of several papers noting a North-South gradient for many autoimmune diseases, including Crohn's, a fact that informed later studies on autoimmunity.

1932

[Regional ileitis: a pathologic and clinical entity](#) This paper was the first to describe disease characterised by inflammation of the terminal ileum, the condition that eventually became known as Crohn's disease.

## Articles

2016 Jun 29 [Old Friends Hypothesis](#) Yolanda Smith, News Medical

2016 Jun 16 [Notes on Parasite Underground](#) Moises Velasquez-Manoff's blog

- 2016 Jun 16 [The Parasite Underground](#) Moises Velasquez-Manoff, New York Times Magazine
- 2016 Jun 3 [Educate Your Immune System: Our bodies are confused by this 21st-century world](#) Moises Velasquez-Manoff, New York Times
- 2016 May 17 [Could worm infection counter IBD? An interview with Dr Loke and Dr Cadwell](#) April Cashin-Garbutt, News Medical
- 2016 Apr 21 [Hooked on hookworms \(and other parasites\)](#) Peter Korn, Portland Tribune
- 2016 Apr 17 [I've got parasitic worms living inside me, and it's great](#) Adam Dudding, Stuff NZ
- 2016 Apr 11 [Meet The Parasites That Might Cure Crohn's Disease, MS, And More](#) Tirumalai Kamala, Forbes and Quora. (multiple sclerosis)
- 2016 Mar 31 [Tapeworms and Other Parasites Can Make Good Guests](#) Carl Zimmer, The New York Times
- 2016 Mar 21 [Life-Sucking Parasites Can Help Save Species](#) Talal Al-Khatib, Discovery
- 2016 Mar 11 [Parasites, pigs and primates – the origin and demography of Trichuris whipworms](#) Anouk Gouvras, Bug Bitten
- 2016 Feb 8 [Why a diet of worms could be good for you](#) David Kohn, The Guardian
- 2016 Jan 13 [If being too clean makes us sick, why isn't getting dirty the solution?](#) William Parker, The Conversation
- 2015 Dec 3 [Parasites in Your Intestines May Actually Be Good for You](#) Ann Pietrangelo, Healthline
- 2015 Nov 13 [What do parasitic worms and our increasing allergies have in common?](#) Graham Rook, The Conversation
- 2015 Nov 11 [40 patients are about to be infected with hookworms to treat gluten intolerance](#) Peter Dockrill, Science Alert
- 2015 Nov 11 [Want a Stronger Defense System Against Diseases? Add Some Worms](#) Sheena Faherty, Scientific American
- 2015 Oct 30 [They might sound gross, but intestinal worms can actually be good for you](#) William Parker, The Conversation
- 2015 Oct 29 [An Evolutionary Basis for Allergies](#) Karen Zusi, The Scientist
- 2015 Sept [Duke scientists treat depression with intestinal worms](#) Teresa Meng, The Chronicle
- 2015 Sept (date accessed) [The "Old Friends" hypothesis: Reopening a can of worms](#) Brenna Doheny, Society for Integrative and Comparative Biology
- 2015 Aug 3 [The Worm Turns](#) Sheena Faherty, Philadelphia Inquirer
- 2015 Aug [Human Whipworm Incubation](#) Ed. John Scott, Foods Matter
- 2015 Jul 16 [Parasites by Post: The Online Black Market for Therapeutic Worms](#) Daniel Viola, Motherboard
- 2015 May 31 [Can Eating Worms Help Treat Allergies & Autoimmune Diseases?](#) Ryan Chamberlin, The Prepper Pages
- 2015 May 29 [Ecological Medicine: Can intestinal worms cure us of our modern pandemics?](#) Rob Dunn, Your Wild Life
- 2015 Apr 6 [The Hygiene Hypothesis -- Redefine, Rename, or Just Clean It Up?](#) Linda Brookes and Laurence Cheng, Medscape (Includes mention of the promotion of barrier integrity by parasites.)
- 2015 Mar 26 [A "Miracle Cure" With Scientific Promise?](#) Mariah Z. Leach, RheumatoidArthritis.net
- 2015 Mar 23 [Parasitic Hookworm Infections and Autoimmune and Allergic Disease](#) Dr. Alexander Rinehart

2015 [Helminths: ASD Cause or Potential Treatment](#) William Parker, Autism Research Institute

2015 [Testing the use of helminth worm ova in treating autism](#) Eric Hollander, Simons Foundation

2014 Dec [An Introduction to Helminthic Therapy](#) John Scott, Foods Matter

2014 Nov 14 [Intestinal parasites may help the immune system, researchers say](#) Sharon Oosthoek, The Globe and Mail

2014 Aug 8 [Health by Hookworm](#) Julia Calderone, Science Notes

2014 Jul 23 [Intestinal parasites are 'old friends,' researchers argue](#) Canadian Institute for Advanced Research (anemia)

2014 May 12 [Parasitic Worms Wiggle Into Modern Medicine](#) Julia Calderone interviews William C. Gause for Scientific American Blogs

2014 Jan 23 [Vitamin Deficit Can Boost Innate Immunity](#) Laasya Samhita, The Scientist

2014 Jan 7 [Helminthic Therapy: An Emerging Intervention in the Era of Immune Dysregulation](#) Mark Davis, Naturopathic Doctor News and Review

2013 Dec 1 [Extreme science: diet of hookworms to tackle a bread allergy](#) Josh Davis, The Guardian

2013 Oct 24 [Pig Whipworm 'Smoothie' May Help Crohn's](#) Digestive Health Team, Health Essentials

2013 Feb 26 [Why We Need Germs](#) Sharon Begley, The Saturday Evening Post

2013 Jan 15 [Can parasites prevent autoimmune diabetes?](#) Moises Velasquez-Manoff, The Human Food Project

2012 Nov 21 [The New \(Ancient\) Cure for Immune Disorders](#) Jim Thornton, Men's Health

2012 Nov 20 [The Potential Health Benefits of Parasitic Gut Worms](#) Brandon Keim, Science

2012 Apr [Timeline following inoculation with hookworm](#) Ed. John Scott, Foods Matter

2012 Mar 2 [Hook Worms as a Treatment for Crohn's Disease](#) Stephanie Faris, Healthline

2012 Mar [The Amazing Dr Wriggly](#) John Scott, Foods Matter

2012 Feb 14 [In a Squeaky-Clean World, a Worm Might Help Fight Disease](#) Shirley S Wang, Wall Street Journal

2012 Feb [Reintroducing Food After Hookworm Treatment For Food Allergy/Intolerance](#) John Scott, Foods Matter

2012 Jan 27 [At UMDNJ, Researchers Seek Healing Powers from Parasites](#) Beth Fitzgerald, NJSpotlight

2012 Jan 15 [Swallowing Parasitic Worms May Heal Your Ails](#) Christopher Wanjek, Live Science

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2011 Aug [Helminthic Therapy Success Stories \(and failures\)](#) Ed. John Scott, Foods Matter

2011 Jul [Helminths Give Chronic Headaches the Old Heave-ho](#) John Scott, Foods Matter

2011 Jun 28 [Parasitic Worms May Offer Hope on MS](#) Sten Stovall, Wall Street Journal (multiple sclerosis)

2011 May 26 [The Parasite Ate Your Depression](#) Emily Deans, Psychology Today

2011 Mar [Don't let worms give you the squirms!](#) John Scott, Foods Matter

2011 Jan [Nasal Allergies Nuked by Worms](#) John Scott, Foods Matter

2010 Dec 1 [New hints on how helminth worms heal ulcerative colitis](#) Thomas H. Maugh II, Los Angeles Times

2010 Dec 1 [For the Good of the Gut: Can Parasitic Worms Treat Autoimmune Diseases?](#) Ferris Jabr, Scientific American

2010 Jun 10 [New gut ecosystem model?](#) Bob Grant, The Scientist

2010 May 23 [Gut instinct: the miracle of the parasitic hookworm](#) Tim Adams, The Guardian (UK)

2010 May 20 [A New Prescription: Parasite Eggs](#) Elizabeth Lopatto, Bloomberg Businessweek

2010 May 17 [Can Dirt Do a Little Good?](#) Melinda Beck, Wall Street Journal

2010 Apr 9 [Fighting Allergies by Mimicking Parasitic Worms](#) Emily Singer, MIT Technology Review

2010 Apr 2 [Medicines made from worms 'could cure asthma and arthritis'](#) The Scotsman

2009 Nov [Wriggling out of Food Intolerance](#) John Scott, Foods Matter

2009 Oct 22 [Worms linked to coeliac relief](#) Dina Rosendorff, News Online, ABC Australia

2009 Aug [Can Parasites Be Good For You?](#) David Pritchard, The Biochemical Society

2009 July 22 [Are Hookworms the Next Claritin?](#) Boonsri Dickinson, Discover Magazine Blog

2009 Jun 6 [How Parasites Trick Your Immune System Into Health](#) Mercola.com

2009 Apr 27 [Parasites Could Be Good for You](#) Brandon Keim, Science

2010 Mar 24 [Which Dirt Should Your Baby Eat?](#) Amanda Schaffer, Slate

2009 Jan 29 [Are worms key to health?](#) NHS Choice

2009 Jan 28 [Infecting patients with worms 'could hold key to treating asthma'](#) Kate Devlin, The Daily Telegraph

2009 [Replacing lost worms to regain health](#) John Scott, Foods Matter

2008 Jul 1 [The Worms Crawl In](#) Elizabeth Svoboda, New York Times

2008 Jun 29 [The Worm Turns](#) Moises Velasquez-Manoff, New York Times

2008 Jun [An Appetite for Worms](#) John Scott, Foods Matter

2008 Mar 16 [Diseases like mine are a growing hazard](#) Donna Jackson Nakazawa, Washington Post

2008 Mar 4 [Immune systems increasingly on attack](#) Rob Stein, Washington Post

2007 Winter [The Good Worms](#) Bruce Morgan, Tufts University Magazine

2007 Dec 31 [His parasite theory stirs a revolution](#) Billy Baker, The Boston Globe

2007 Nov 30 [Could Stem Cells Be Used To Cure Crohn's Disease?](#) Science Daily

2007 Sept 15 [Scientists recruit worms for fight against asthma](#) James Randerson, The Guardian

2007 Sept 15 [Blood-sucking hookworms may harbour asthma cure](#) BioScholar

2005 Nov 2 [Worm Therapy: a New Treatment for IBD?](#) Patrick Perry, Saturday Evening Post c/o EarthWormDigest.org (Scroll down page to locate article.)

2001 June [Why We Need Germs](#) Garry Hamilton, The Ecologist Report

## Videos

2016 May 20 [Sid Baker: Beetlejuice! Beetlejuice! Beetle Larvae? – #311](#) Dave, Bulletproof (autism)

2016 Apr 21 [Worm infection counters intestinal inflammation by changing gut microbiome](#) The Cadwell and Loke Labs

2016 Mar 23 [Parasites, Autoimmunity & Allergies](#) Moises Velasquez Manoff, High Intensity Health

- 2014 Sept 28 [Biome normalization using Hymenolepis diminuta \(HDC\)](#) Judith Chinitz, CDePalma (autism)
- 2014 May 6 [Parasites Lost: The Journey from Woeful Worms to Helpful Monsters](#) Christopher Blonar, TEDxNSU
- 2014 Apr 1 [Reshaping the immune system](#) Moises Velazquez-Manoff at TEDxCibeles
- 2014 Jan 29 [Rachel Clarke on conscious infestation of the gut with worms](#) (Parkinson's disease)
- 2013 Aug 1 [Why Parasites May Not Be All That Bad](#) Trace Dominguez, DNews
- 2012 Oct 31 [Parasite hookworm infection](#) Dr James Logan's Hookworm Experiment for Channel 4 TV
- 2011 Feb 10 [The Worm Crew](#) Joel Weinstock on how he became interested in studying the effects of helminths on IBD
- 2010 Mar 12 [Medical Alert: Worms Used As Therapy](#) Donna Hamilton, WBAL-TV 11 Baltimore
- 2010 Feb 18 [Hook Worms](#) Jonica Newby, Catalyst (coeliac disease)
- 2009 Nov 16 [House MD, Season 6, Episode 8: "Teamwork"](#) A patient's has a Crohn's flare after deworming. mp4
- 2009 May 26 [Helminthic therapy allergies asthma](#) Interviews with scientists and patients using helminthic therapy to control allergies and asthma
- 2008 May 24 [Helminth Therapy](#) Video about helminthic therapy by Asphelia Pharmaceuticals
- 2008 Mar 14 [Helminthic therapy - Autoimmune Therapies](#) Jasper Lawrence collects hookworms from Cameroon

## Webinars

- 2016 Jan 20 [Autism & Helminths: The Good, the Bad, and the Rumors](#) William Parker, Autism Research Institute
- 2015 May 6 [Microbiome Research in Autism Spectrum Disorders](#) William Parker (Helminths mentioned from 34 minutes)

## Podcasts

- 2015 Nov 2 [The Enemy of my Enemy, Part 2: A Can of Worms](#) Sam Ancona Esselmann interviews Moises Velasquez Manoff for Carry the One Radio
- 2015 Jun 19 [The Future of Healing the Immune System: Biome Reconstitution](#) Neil Nathan interviews William Parker for The Cutting Edge of Health, and Wellness Today
- 2012 Jan 25 [Got Bugs!](#) William Parker, AutismOne
- 2010 Apr 2 [An update on hookworms](#) Patrick Walters, Radiolab
- 2010 Apr 2 [Enemy Camp 2012: Act Three. As The Worm Turns](#) This American Life
- 2009 Sept [Sculptors of Monumental Narrative](#) Dickson Despommier and Pat Walters, Radiolab

## Books

- 2015 Dec 1 [Body by Darwin: How Evolution Shapes Our Health and Transforms Medicine](#) Jeremy Taylor. (There's an extended excerpt of this book on Live Science, [here](#))
- 2012 Sept 4 [An Epidemic of Absence: A New Way of Understanding Allergies and Autoimmune Diseases](#) Moises Velazquez-Manoff
- 2011 Jun 21 [The Wild Life of Our Bodies: Predators, Parasites, and Partners That Shape Who We Are Today](#) Rob Dunn

2009 Sept 18 [The Hygiene Hypothesis and Darwinian Medicine \(Progress in Inflammation Research\)](#)  
Edited by Graham Rook

2007 Apr 2 [Riddled with Life: Friendly Worms, Ladybug Sex, and the Parasites That Make Us Who We Are](#)  
Marlene Zuk

## Lecture/slide presentation

2014 [Infections and autoimmunity; how to harness nature to treat autoimmunity](#) Yehuda Shoenfeld

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