Summary of included studies

Source	Number of subjects	Animal	Asthma model	Study design	Intervention	Outcomes
Dugger et al. 2010	unknown	BALB/c with CD4+ Thy1.2+ cell from the D011.10-T^{LUX} model sex unknown age unknown	"OVA sensitization/challenge"	CT	Treadmill at 13.5 m/min , 0% grade (no other information stated)	-T helper cell CCR7, CCR8, CXCR3, and CCR4 expression, function, and migration in/out of the lung
Hewitt et al., 2010	8-16	BALB/cJ females age 3 – 5 weeks	OVA-alum IP days 0, 14; then aerosolized OVA (concentration unclear) days 21 – 25 & day 28	CT	Treadmill 45 – 60 min 3x/week for 4 weeks at 13.5 m/min, 0% grade; in addition, 15 min total warm-up/cool-down per session. Started 1h post OVA treatment on day 28	-serum epinephrine -BAL: PGE_2 -lung histology: airway smooth muscle thickness -ex-vivo airway smooth muscle cells analyzed for β_2 AR , GRK-2, EP1 -airway resistance to increasing amounts of methacholine
Lowder et al., 2010	6-12	C.Cg-$Foxp3^{tm2Tch}$/J reporter on BALB/cJ background females age 5 – 6 weeks	OVA-alum 50 mcg days 0, 14; then aerosolized OVA at 5 mg/mL 30 min/day x 5 days for day 21 – 25, then 10 min 3 days/week for the remainder	RCT	Treadmill for 45 min 3x/wk for 4 wks at 10 – 13.5 m/min, 0% grade. Started 1h post-OVA on day 28	-BAL: total cells, differential -Lung flow cytometry for % Foxp3+ cells -in vitro suppression of effector cell proliferation by CD4+CD25+Foxp3+ cells from the lungs, mediastinal lymph nodes, spleen -in vitro levels of lung/spleen Il-4, Il-5, TGF-β, Il-10, Il-17 in the supernatents of spleen cultures at an effector:suppressor ratio of 1:1
Pastva et al., 2005	10-12	BALB/cJ females age 3 – 5 weeks	OVA 50 mcg IP days 0, 14; then aerosolized OVA at 5 mg/mL for 30 min/day x 5 days starting day 21, thereafter boosters of aerosolized OVA at the same concentration 10 min/day 5days/wk	RCT	Treadmill: 1^{st} week 10m/min x 30 min 3x/wk, thereafter 45 min at 13.5 m/min 0% grade 3x/week for 3 weeks; in addition 15 min total warm-	-BAL: total cells, eosinophils, CXC chemokine KC, VCAM-1 -lung immunofluorescence: NF-κB DNA binding activity, NF-κB nuclear translocation

					up/cool-down. Started 1-2h post OVA on day 28.	
Pastva et al., 2004	10-18	BALB/cJ females age 3 – 5 weeks	OVA- alum 50 mcg IP days 0, 14; then aerosolized OVA 5mg/mL starting day 21 for 30min/day x 5days, then 10min/day 5days/wk	RCT	Treadmill for 45 min 3x/wk for 4 weeks at 10 m/min 0% grade x 2 weeks, then 13.5m/min 0% grade x 2 weeks; in addition, 15 min total of warm-up/cool down per session. Started 2h post OVA on day 28.	-serum: total IgE , OVA-specific IgE -BAL: total cells, differential, total protein, KC, MCP-1, RANTES, Il-4, Il-5 -lung histology : peribronchial lymphocytes, perivascular lymphocytes, epithelial hypertrophy, goblet cells/mucin, index of inflammation, immunohistochemistry for VCAM-1, NF-κB p65
Silva et al., 2010	14	BALB/c males age 4 weeks	OVA-alum 10 mcg IP days 0, 14, 28, 42; then 1% aerosolized OVA starting day 21 for 30 min 3x/week until day 54	CT	Treadmill for 60 min 5x/wk for 4 weeks at 50% max speed based on a maximal exercise capacity test. Started day 28	-serum IgE and IgG_1 -peribronchial histology: eosinophils , mucous production, airway smooth muscle thickness, airway collagen deposition, airway elastic fiber deposition -peribronchial immunohistochemistry:, CD3+ T cells, CD4+ T cells, Il-4, Il-5, Il-13, Il-2, IFN-γ, Fox p3, Il-10, Il-1ra, NF-κB
Vieira et al., 2011	16	BALB/c males age unclear	OVA-alum 20 mcg IP days 0, 14, 28, 42; then 1% aerosolized OVA starting at day 21 3x/week until day 50	CT	Treadmill for 60 min 5 x/week for 4 weeks at 50% max speed based on a maximal exercise capacity test. Started 1 day post first OVA aerosolization.	-BAL: total cells, eosinophils, epithelial cells -airway tissue histology: goblet cells, neutral mucin , ciliated cells -airway immunohistochemistry: Il-13, Il-14, Il-5, VCAM-1, CCL11, CCL5, ICAM-1, eNOS, nNOS, iNOS, Il-2, IFN-γ, NF-κB , Il-10, SOD1, SOD2, GPX,

						GP91phox, 3-Nitrotyrosine, 8-Isoprostane, IGF-1, EGFr, VEGF, TGF-β, MMP-12, TIMP-1, TIMP-2, MMP-9, P2X7R
Vieira et al., 2009	16	BALB/c males age unclear	OVA-alum 10 mcg IP days 0, 14, 28, 42; then 1% aerosolized OVA starting day 21 for 30 min 3x/wk up to day 53 Both groups also given oral creatine supplementation (0.5g/kg 5x/week from day 21 to 53).	CT	Treadmill for 60 min 5x/week for 4 wks at 50% max speed based on a maximal exercise capacity test. Started 1 day post first OVA aerosolization.	-BAL: total cell count, differential -airway histology: peribronchial density of eosinophils, airway volume proportion of collagen & elastic fibres, airway smooth muscle index, bronchoconstriction index -airway immunohistochemistry: Il-4, Il-5,Il-2, IFN-γ, Il-10
Vieira et al., 2008	16	BALB/c males age unclear	OVA –alum 20 mcg IP days 0, 14, 28, 42; then 1% aerosolized OVA 3x/week days 21 - 50	CT	Treadmill for 60 min 5 x/week for 4 weeks at 75% max speed based on baseline maximal exercise test. Started 1 day post first OVA aerosolization.	-lung histology: perivascular eosinophils & mononuclear cells, parenchymal eosinophils & mononuclear cells, volume proportion of elastic & collagen fibres in the artery wall and in lung parenchyma -lung immunochemistry: perivascular expression of Il-4, Il-5, Il-2, IFN-γ, MCP-1, IGF-1, Il-10, NF-κB p65, parenchymal expression of Il-4, Il-5, Il-2, IFN-γ, MCP-1, IGF-1, Il-10, NF-κB
Vieira et al., 2007	16	BALB/c males age unclear	OVA-alum 20 mcg IP days 0, 14, 28, 42; then 1% aerosolized OVA 3x/week days 21 - 50	CT	Treadmill for 60 min 5 x/week for 4 weeks at 50% max speed based on baseline maximal exercise test. Started 1 day post first OVA aerosolization.	-serum IgE, IgG1 titres -BAL : total cell count, eosinophils, PMNs, mononuclear cells -airway histology: peribronchial density of mononuclear cells, eosinophils , volume proportion of collagen,

						elastic fibres , smooth muscle area, epithelial thickness, bronchoconstriction index -airway immunohistochemistry: Il-4, Il-5,Il-2, Il-10, IFN-γ

BALB : Bagg Albino (inbred research mouse strain), OVA : ovalbumin, CT : controlled trial, CCR : chemokine (C-C motif) receptor, CXCR : CXC chemokine receptor, alum : aluminum hydroxide, IP : intraperitoneal, BAL : bronchoalveolar lavage, PGE_2 : prostaglandin E2, β2AR : beta-2 adrenergic receptor, GRK2 : G-protein receptor kinase 2, EP1 : E prostanoid-1 receptor, Treg : regulatory T cell–specific transcription factor, RCT : randomized controlled trial, CD : cluster of differentiation, Il : interleurkin, TGFβ : transforming growth factor-beta, KC : keratinocyte chemoattractant, VCAM-1 : vascular cell adhesion molecule-1, NF-κB p65 : a subunit of the nuclear factor-kappa B transcription complex, IgE : immunoglobulin E, MCP-1 : monocyte chemotactic protein-1, RANTES : regulated upon activation normal T cell expressed and secreted, IgG1 : immunoglobulin G1, CCL : chemokine (C-C motif) ligand, ICAM-1 : intercellular adhesion molecule-1, eNOS : endothelial nitric oxide synthase, nNOS : neuronal nitric oxide synthase, iNOS : inducible nitric oxide synthase, IFN-γ : interferon-gamma , SOD1 : superoxide dismutase-1, GPX : glutathione