The thromboxane A₂ pathway through its end product thromboxane A₂ is implicated in the development and progression of many chronic diseases.

There is clear clinical and/or experimental evidence platelet thromboxane A₂ release is greatly enhanced in a number of chronic diseases. Frequently in these diseases, the balance between thromboxane A₂ and prostacyclin is significantly altered, resulting in excessive vasoconstriction and disorders of hemostasis.

Levels of urinary 11-dehydrothromboxane B₂ reflect activity of components of the thromboxane A₂ pathway resulting in thromboxane A₂ generation.

Alzheimers

1. Determinants of platelet activation in Alzheimer’s disease.
   2005 • Elsevier • Clinical Review • Human • 11-DHTXB2

   “Urinary 11-dehydroTXB₂ and 8-iso-PGF₂α were significantly higher in Alzheimer patients than in controls”
   “No difference was found in CRP, TNF-α and IL-6 levels between the two groups.”
   “Platelet activation is persistently enhanced in Alzheimer’s disease.”

Asthma

1. Correlation between the clinical effects of seratrodast and the level of 11-dehydrothromboxane B₂ in urine/sputum in bronchial asthma patients.
   2001 • Chi • Clinical Study • Human • 4 Patients • 11-DHTXB2

   “These results suggested that bronchial asthma patients with high urinary 11-DHTXB2 levels could markedly respond to Seratrodast treatment.”
2. **11-dehydro-thromboxane b₂, a stable thromboxane metabolite, is a full agonist of chemoattractant receptor-homologous molecule expressed on TH2 cells (CRTH2) in human eosinophils and basophils.**

2003 • J Bio Chem • Clinical Research • Human • 11-DHTXB2

“In addition to TXA₂, which is capable of causing bronchoconstriction, lasma extravasation, and chemokine expression, its stable metabolite 11-dehydro-TXB₂ might also be directly involved in the recruitment of eosinophils, basophils and presumably TH2 lymphocytes to sites of inflammation.”

**Atherosclerosis**

1. **Relation between atherosclerosis risk factors and aspirin resistance in a primary prevention population.**

2006 • Am J Cardiol • Clinical Review • Human • 11-DHTXB2

“Aspirin resistance by platelet function analyzer-100 was associated only with increased von Willebrand factor levels and not with atherosclerotic risk profile.”

2. **Prostanoid and TP-receptors in atherothrombosis: Is there a role for their antagonism?**

2010 • Thromb Hemost • Clinical Review • Human

“Dysfunctional endothelium, characterized by increased COX-activity, releases prostanoids that promote endothelial exposure to adhesion molecules and induce smooth muscle cell contraction.”

3. **Mechanisms of atherothrombosis in chronic obstructive pulmonary disease.**

2008 • Int J Chron Obstruct Pulmon Dis • Clinical Review

“CPR upregulates the production of pro-inflammatory cytokines and tissue factor by monocytes, increases the uptake of low-density lipoproteins (LDL by macrophages with foam cells formation and directly induces expression of adhesion molecules by human endothelial cells.”

4. **Inflammation and platelet activation in peripheral arterial occlusive disease.**

2007 • Int J Angiol • Clinical Research • Human • 11-DHXTB2

“A positive correlation between 11-DHTXB2 and CRP was found in the study population.”
Chronic Obstructive Pulmonary Disease

1. **Enhanced thromboxane biosynthesis in patients with chronic obstructive pulmonary disease**
   
   1997 • Am J Resp Crit Care Med • Clinical Research • Human • 11-DHTXB2

   “The urinary excretion of 11-dehydro-TxB2 was significantly higher in patients with COPD than in control subjects. Moreover, 11-dehydro-TxB2 excretion was inversely related with arterial oxygen tension.”

2. **[Changes of thromboxane A2 (TXA2) and prostacyclin (PGI2) in COPD patients with pulmonary hypertension].**
   
   1991 • Chin J Integr Med • Clinical Research • Humans • 30 Patients/10 Subjects

   “The results showed that the level of TXA2 increased significantly in COPD patients with dominant and latent pulmonary hypertension when compared with that in normal subjects.”

Diabetes

1. **Acute, short-term hyperglycemia enhances shear stress-induced platelet activation in patients with type II diabetes mellitus.**

   2003 • Am J Cardiol • Clinical Research • Human • 12 Patients • 11-DHXTB2

   “Compared with non-diabetics, patients with Type II diabetes mellitus (T2Dm have a two- to four-fold increased risk of ischemic cardiovascular disease, a risk largely independent of concomitant hypertension, hypercholesterolemia, and smoking.”

3. **Thromboxane biosynthesis and platelet function in type II diabetes mellitus.**

   1990 • N Engl J Med • Clinical Research • Human • 50 Subjects • 11-DHXTB2

   “Tight metabolic control achieved with insulin therapy reduced the levels of 11-dehydro-thromboxane B2 by approximately 50 percent.”

   “Aspirin in low doses (50 mg per day for seven days) reduced urinary excretion of the metabolite by approximately 80 percent in four patients.”
4. **The effect of aspirin dosing on platelet function in diabetic and nondiabetic patients.**

2007 • ADA • Clinical Research • Human • 120 Subjects • 11-DHXTB2

"Diabetic patients with CAD treated with 81 mg aspirin exhibit a higher prevalence of aspirin resistance and have significantly higher ADP- and collagen-induced platelet aggregation, 11-DHXTB2 levels, and aspirin reaction units measured by Verify Now than nondiabetic patients."

5. **Thromboxane-dependent CD40 ligand release in type II diabetes mellitus.**

2006 • Am J Cardiol • Clinical Research • Human • 114 Subjects • 11-DHXTB2

"This study provides several lines of evidence for the dependence of sCD40L release on TXA2-dependent platelet activation in T2DM and provides novel mechanistic insight into the amplification loops of persistent platelet activation in this setting."

6. **Urinary 11-dehydro thromboxane B2 levels in type 2 diabetic patients before and during aspirin intake.**

2011 • CCA • Clinical Research • Human • 81 Subjects • 11-DHTXB2

"Most patients enrolled in the present study also presented a reduced or minimal response to low-dose aspirin therapy, thereby indicating a clear variability related to aspirin effectiveness."

7. **Platelet thromboxane (11-dehydro-thromboxane B2) and aspirin response in patients with diabetes and coronary artery disease.**

2014 • World J Diabetes • Clinical Review • Human • 11-DHTX2

"Patients with DM and CAD have significantly higher mean baseline levels of urinary 11-DHTXB2 than healthy controls likely indicating a higher platelet activation and risk for CVD."

**Erectile Dysfunction**

1. **The change of urinary 11-dehydro-thromboxane B2 and 2,3-dinor-6-keto-prostaglandin F1 alpha in arteriogenic impotence.**

1992 • NCBI • Clinical Research • Human • 60 Subjects • 11-DHTXB2

"Our findings suggest that urinary 11-dehydro-thromboxane B2 may have an important role in the diagnosis and treatment of arteriogenic impotence."
HIV

1. **Sex differences in urinary biomarkers of vascular and endothelial function in HIV-infected persons receiving antiretroviral therapy.**

2012 • IMP • Clinical Research • Human • 107 Subjects • 11-DHTXB2

“There were sex-specific differences in urinary eicosanoids, with females having more risk-associated parameters despite a low Framingham score.”

Hypertension

1. **An imbalance between the excretion of thromboxane and prostacyclin metabolites in pulmonary hypertension.**

1992 • N Engl J Med • Clinical Research • Human • 20 Subjects • 11-DHTXB2

“An increase in the release of the vasoconstrictor thromboxane A₂, suggesting the activation of platelets, occurs in both the primary and secondary forms of pulmonary hypertension.”

Obesity

1. **Platelet activation in obese women, role of inflammation and oxidant stress.**

2002 • JAMA • Clinical Research • Human • 93 Subjects • 11-DHTXB2

“Android obesity is associated with enhanced lipid peroxidation and persistent platelet activation.”

Peripheral Arterial Disease

1. **Inflammation and platelet activation in peripheral arterial occlusive disease.**

2007 • Int J Angiol • Clinical Research • Human • 26 Subjects • 11-DHTXB2

“Platelet activation, assessed by measuring urinary excretion of 11-DHTXB2, is related to the presence and severity of PAOD and to inflammation.”
2. **Diabetes mellitus, hypercholesterolemia, and hypertension but not vascular disease per se are associated with persistent platelet activation in vivo. Evidence derived from the study of peripheral arterial disease.**

1997 • NCBI • Clinical Research • Human • 64 Subjects • 11-DHTXB2

“Urinary 11-dehydro-TXB2 was significantly (P = .0001) higher in patients with peripheral arterial disease than in control subjects.”

“The rate of TXA2 biosynthesis appears to reflect the influence of coexisting disorders such as diabetes mellitus, hypercholesterolemia, and hypertension of platelet biochemistry and function.”

**Stroke**

1. **Urinary 11-dehydro-thromboxane B2 and coagulation activation markers measured within 24 h of human acute ischemic stroke.**

2001 • Elsevier • Clinical Research • Human • 25 Subjects • 11-DHXTB2

“Marker levels in patients with ischemic stroke were compared with those in 19 age-matched controls who had not taken aspirin for at least 2 weeks before sampling and 25 healthy controls.”

**Thromboxane A2 pathway schematics**