

Coxsackievirus and Diabetes mellitus: An overlooked important connection

*NAISSA - Enzyme immunoassay for qualitative detection of
Coxsackievirus B IgM/IgG (Ref. N145D24CXM, N146D24CXG)*

General information

Diabetes mellitus type 1 also called the insulin-dependent diabetes mellitus is a chronic autoimmune disease induced by the destruction of insulin-producing b-cells of Langerhans' islets caused by autoimmune inflammation reaction. This is characterized by a large or complete lack of insulin production. Diabetes mellitus type 1 represents 5–10% of all cases of diabetes, a disease with frequently serious and severe consequences for the patient such as ketosis, ketoacidosis, microangiopathy, cerebral vascular accidents, retinopathies, cataract, glaucoma, hypertension, ischaemic cardiomyopathy, glomerulosclerosis and gangrene [1].

Enteroviruses are considered the main viral candidates for causing type 1 diabetes in humans [2]. A recent systematic review that analyzed papers published on this topic documented a significant association between enteroviruses and autoimmunity/type 1 diabetes [3].

Coxsackie B virus (CVB) is the most prevalent enterovirus in pre-diabetic and diabetic patients [2]. Several studies have reported the presence of CVB RNA in the blood of type 1 diabetes patients [4–7]. There is even evidence of CVB4 being detected in pancreatic tissue from patients with type 1 diabetes [8]. The molecular basis of autoimmunity in CVB4 infection is proposed to be a **molecular mimicry** [9], where the 2C non-structural CVB protein has a shared sequence with the glutamic acid decarboxylase 65 enzyme (GAD65), which is predominantly expressed in pancreatic beta cells [10]. This results in immunological cross-reactivity caused by sequence similarity between self- and non-self-antigens. Particularly GAD65 was found to play an important role in the pathogenesis of type 1 diabetes as a target autoantigen [11]. **Bystander activation** of autoreactive T cells and rapid death of CVB-infected beta cells was also a suggested mechanism by which CVB4 induces and accelerates diabetes.

NAISSA is the only platform that provides fully automated detection of IgM and IgG antibodies to Coxsackie B virus.

Diagnostic Efficiency

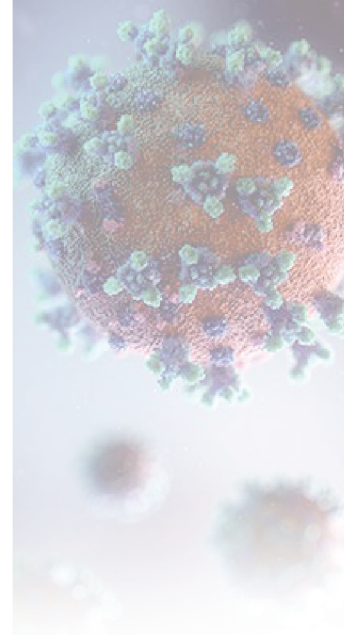
Product	Sensitivity	Specificity
Coxsackievirus B IgM	>98%	>98%
Coxsackievirus B IgG	>98%	>98%

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NAISSA also enables the detection of antibodies against insulin (present in up to 70% of patients), with these autoantibodies being a marker for destruction of insulin producing b-cells. Anti-insulin antibodies are found in 37% of patients with newly detected diabetes type I and in 2-6% of their relatives of the first degree.

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Product	Order No.	Kit
Coxsackievirus B IgM	N145D24CXM	24 tests
Coxsackievirus B IgG	N146D24CXG	24 tests
Anti Insulin	N281A24INS	24 tests

NAISSA monotest immunoanalyzer - BENEFITS

- ✓ **One Cartridge - one test**
- ✓ **Simplify operation** - just add sample and click RUN
- ✓ **Save your time** - ready to use reagents
- ✓ **Factory precalibrated**
- ✓ **QC material included**
- ✓ **No crossover** - Cartridge laminated with three layers plastic foil, provide completely safety and stability
- ✓ **Quantitative evaluation of results**
- ✓ **High diagnostics specificity and sensitivity**
- ✓ **High reproducibility**
- ✓ **Total automatisation**
- ✓ **Small package size** (24 tests, calibrators and control)

