



## Anti-Alanyl-tRNA synthetase autoantibodies (PL12)

**Synonyms** anti-PL12 (PL: precipitation line)

- Indications**
- ▶ Dermatomyositis
  - ▶ Polymyositis
  - ▶ PM/DM-overlap syndromes with other connective tissue diseases
  - ▶ Antisynthetase syndrome
  - ▶ Interstitial lung disease
  - ▶ Raynaud's phenomenon (active stage, before starting therapy)

**see also** ▶ [Autoantibodies in idiopathic inflammatory myopathies](#)

**Antigens** The alanyl-tRNA synthetase (EC 6.1.1.7;  $M_r$  106,8 kDa; chromosome 16q22) belongs to the family of aminoacyl tRNA synthetases, which catalyze the ester bond of amino acids to their specific transport RNA (tRNA). The latter ones are engaged in the transport of amino acids for their assembly into the nascent polypeptide chain within the ribosomes.

**Autoantibodies** The indirect immunofluorescence test (HEp-2-cells) of sera containing anti-tRNA synthetase antibodies reveals an exclusive cytoplasmic fluorescence pattern. The anti-PL12 antibodies react with multiple conformational and conformation independent epitopes of the antigen. Some antibodies also recognize the catalytic domain of the synthetase and inhibit its catalytic activity *in vitro*. The antibodies largely belong to the immunoglobulin isotype IgG. Quite often patients harboring antibodies reacting against the synthetase also develop antibodies against the respective tRNA.

**Prevalence** Antibodies against the alanyl-tRNA synthetase can be detected in up to 8 % of adult patients manifesting polymyositis/dermatomyositis and/or myositis associated interstitial lung disease. In adults the antibodies can be detected early in the beginning of the disease and sometimes also prior to the onset of the clinical manifestations.

**Clinic** Patients exhibiting antibodies against alanyl-tRNA synthetase may develop an antisynthetase syndrome, which presents itself with varying symptoms of myositis, interstitial lung disease, arthritis, so called "mechanic hands" (rough, cracked skin at the tips and lateral aspects of the fingers forming irregular dirty-appearing fissures because of hyperkeratosis), Raynaud's phenomenon, sclerodactyly, calcinosis cutis and sicca-syndrome. The clinical manifestations of the antisynthetase syndromes may vary according to the antigen specificity of the respective anti-synthetase antibodies (table 1).

**Table 1** Clinical manifestations in anti-PL12 positive patients (Hamaguchi et al. 2013).

DM	CADM	PM	DM/PM-OM	SSc	ILD	LES
11 %	28 %	11 %	-	11 %	33 %	6 %
DM	dermatomyositis					
CADM	clinically amyopathic dermatomyositis					
DM/PM-OM	DM/PM-overlap					
PM	polymyositis					
SSc	systemic sclerosis					
ILD	interstitial lung disease					
SLE	systemic lupus erythematosus					



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Autoantibodies against tRNA synthetases are mutually exclusive. The simultaneous occurrence of two anti-tRNA-synthetase antibodies of different antigen specificities is extremely rare. But their association with antibodies not specific for myositis, so called myositis-associated antibodies (MAA), directed against topoisomerase, centromeres, U1snRNP, Th/To, U3snRNP, Sm, SS-A/Ro 52 or SS-A/La may be seen quite often.

### Literature

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